



# Back to Basics: Vaccine Errors and Ways to Avoid Them- Pediatric and Adult Case Studies

FALL IMMUNIZATION CONFERENCE 2023

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# Use the Vaccine Administration Protocols:

## **Review Immunization History**

Reviewing and assessing a patient's immunization history should be done at every health care visit to help determine which vaccines may be needed

## **Assess for Needed Immunizations**

Use the current Advisory Committee on Immunization Practices (ACIP) immunization schedule to determine what recommended vaccines are needed based on the patient's immunization history

## **Screen for Contraindications and Precautions**

Screening for contraindications and precautions can prevent adverse events following vaccination. All patients should be screened for contraindications and precautions prior to administering any vaccine, even if the patient has previously received that vaccine



# Vaccine Administration Protocols Cont:

## **Educate the Patient**

Health care professionals should be prepared to provide comprehensive vaccine information

## **Prepare the Vaccine(s)**


Proper preparation is critical for maintaining the integrity of the vaccine during transfer from the vial to the syringe

## **Administer the Vaccine(s)**

Each vaccine has a recommended administration route and site, which are based on clinical trials, practical experience, and theoretical considerations

## **Document the Vaccination(s)**

Health care providers are required by law to record certain information in a patient's medical record



# Before You Vaccinate Consider the Following:

During your assessment, respond to these four questions:

1. What vaccine(s) does the person need today?
2. Based on the persons current medical history are there any contraindications or precautions to receiving the recommended vaccines today?
3. Are there any medical conditions or other indications that would suggest the need for additional vaccines?
4. What vaccine(s) will you give today?
5. When should this person return and what vaccines will be recommended at that visit?



# Know Your Pediatric Resources and Where to Find Them

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# 2023 Recommended Immunization Schedule for Children and Adolescents

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

In addition to the recommendations presented in the previous sections of this Immunization Schedule, ACIP has approved the following recommendations by majority vote since October 20, 2022. The following recommendations have been adopted by the CDC Director and are now official. Links are provided if these recommendations have been published in *Morbidity and Mortality Weekly Report (MMWR)*.

**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.

**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.

**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 mos	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	2 <sup>nd</sup> dose	3 <sup>rd</sup> dose	4 <sup>th</sup> dose	5 <sup>th</sup> dose	6 <sup>th</sup> dose	7 <sup>th</sup> dose	8 <sup>th</sup> dose	9 <sup>th</sup> dose	10 <sup>th</sup> dose	11 <sup>th</sup> dose	12 <sup>th</sup> dose	13 <sup>th</sup> dose	14 <sup>th</sup> dose	15 <sup>th</sup> dose	16 <sup>th</sup> dose	17 <sup>th</sup> dose
Rotavirus (RV): RV1 (2-dose series), RV5 (3-dose series)	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	6 <sup>th</sup> dose	7 <sup>th</sup> dose	8 <sup>th</sup> dose	9 <sup>th</sup> dose	10 <sup>th</sup> dose	11 <sup>th</sup> dose	12 <sup>th</sup> dose	13 <sup>th</sup> dose	14 <sup>th</sup> dose	15 <sup>th</sup> dose	16 <sup>th</sup> dose	17 <sup>th</sup> dose
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	6 <sup>th</sup> dose	7 <sup>th</sup> dose	8 <sup>th</sup> dose	9 <sup>th</sup> dose	10 <sup>th</sup> dose	11 <sup>th</sup> dose	12 <sup>th</sup> dose	13 <sup>th</sup> dose	14 <sup>th</sup> dose	15 <sup>th</sup> dose	16 <sup>th</sup> dose	17 <sup>th</sup> dose
Haemophilus influenzae type b (Hib)	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	6 <sup>th</sup> dose	7 <sup>th</sup> dose	8 <sup>th</sup> dose	9 <sup>th</sup> dose	10 <sup>th</sup> dose	11 <sup>th</sup> dose	12 <sup>th</sup> dose	13 <sup>th</sup> dose	14 <sup>th</sup> dose	15 <sup>th</sup> dose	16 <sup>th</sup> dose	17 <sup>th</sup> dose
Pneumococcal conjugate (PCV13, PCV15)	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	6 <sup>th</sup> dose	7 <sup>th</sup> dose	8 <sup>th</sup> dose	9 <sup>th</sup> dose	10 <sup>th</sup> dose	11 <sup>th</sup> dose	12 <sup>th</sup> dose	13 <sup>th</sup> dose	14 <sup>th</sup> dose	15 <sup>th</sup> dose	16 <sup>th</sup> dose	17 <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	5 <sup>th</sup> dose	6 <sup>th</sup> dose	7 <sup>th</sup> dose	8 <sup>th</sup> dose	9 <sup>th</sup> dose	10 <sup>th</sup> dose	11 <sup>th</sup> dose	12 <sup>th</sup> dose	13 <sup>th</sup> dose	14 <sup>th</sup> dose	15 <sup>th</sup> dose	16 <sup>th</sup> dose	17 <sup>th</sup> dose
COVID-19 (1+ COVID-mRNA, 2+ COVID-mRNA, 1+ COVID-aP)	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	6 <sup>th</sup> dose	7 <sup>th</sup> dose	8 <sup>th</sup> dose	9 <sup>th</sup> dose	10 <sup>th</sup> dose	11 <sup>th</sup> dose	12 <sup>th</sup> dose	13 <sup>th</sup> dose	14 <sup>th</sup> dose	15 <sup>th</sup> dose	16 <sup>th</sup> dose	17 <sup>th</sup> dose
Influenza (IV4)	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	6 <sup>th</sup> dose	7 <sup>th</sup> dose	8 <sup>th</sup> dose	9 <sup>th</sup> dose	10 <sup>th</sup> dose	11 <sup>th</sup> dose	12 <sup>th</sup> dose	13 <sup>th</sup> dose	14 <sup>th</sup> dose	15 <sup>th</sup> dose	16 <sup>th</sup> dose	17 <sup>th</sup> dose
Influenza (LAIV4)	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	6 <sup>th</sup> dose	7 <sup>th</sup> dose	8 <sup>th</sup> dose	9 <sup>th</sup> dose	10 <sup>th</sup> dose	11 <sup>th</sup> dose	12 <sup>th</sup> dose	13 <sup>th</sup> dose	14 <sup>th</sup> dose	15 <sup>th</sup> dose	16 <sup>th</sup> dose	17 <sup>th</sup> dose
Measles, mumps, rubella (MMR)	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	6 <sup>th</sup> dose	7 <sup>th</sup> dose	8 <sup>th</sup> dose	9 <sup>th</sup> dose	10 <sup>th</sup> dose	11 <sup>th</sup> dose	12 <sup>th</sup> dose	13 <sup>th</sup> dose	14 <sup>th</sup> dose	15 <sup>th</sup> dose	16 <sup>th</sup> dose	17 <sup>th</sup> dose
Varicella (VAR)	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	6 <sup>th</sup> dose	7 <sup>th</sup> dose	8 <sup>th</sup> dose	9 <sup>th</sup> dose	10 <sup>th</sup> dose	11 <sup>th</sup> dose	12 <sup>th</sup> dose	13 <sup>th</sup> dose	14 <sup>th</sup> dose	15 <sup>th</sup> dose	16 <sup>th</sup> dose	17 <sup>th</sup> dose
Hepatitis A (HepA)	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	6 <sup>th</sup> dose	7 <sup>th</sup> dose	8 <sup>th</sup> dose	9 <sup>th</sup> dose	10 <sup>th</sup> dose	11 <sup>th</sup> dose	12 <sup>th</sup> dose	13 <sup>th</sup> dose	14 <sup>th</sup> dose	15 <sup>th</sup> dose	16 <sup>th</sup> dose	17 <sup>th</sup> dose
Tetanus, diphtheria, acellular pertussis (Tdap >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	6 <sup>th</sup> dose	7 <sup>th</sup> dose	8 <sup>th</sup> dose	9 <sup>th</sup> dose	10 <sup>th</sup> dose	11 <sup>th</sup> dose	12 <sup>th</sup> dose	13 <sup>th</sup> dose	14 <sup>th</sup> dose	15 <sup>th</sup> dose	16 <sup>th</sup> dose	17 <sup>th</sup> dose
Human papillomavirus (HPV)	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	6 <sup>th</sup> dose	7 <sup>th</sup> dose	8 <sup>th</sup> dose	9 <sup>th</sup> dose	10 <sup>th</sup> dose	11 <sup>th</sup> dose	12 <sup>th</sup> dose	13 <sup>th</sup> dose	14 <sup>th</sup> dose	15 <sup>th</sup> dose	16 <sup>th</sup> dose	17 <sup>th</sup> dose
Meningococcal (MenACWY-D ≥9 mos, MenACWY-CRM ≥2 mos, MenACWY-TT ≥2 years)	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	6 <sup>th</sup> dose	7 <sup>th</sup> dose	8 <sup>th</sup> dose	9 <sup>th</sup> dose	10 <sup>th</sup> dose	11 <sup>th</sup> dose	12 <sup>th</sup> dose	13 <sup>th</sup> dose	14 <sup>th</sup> dose	15 <sup>th</sup> dose	16 <sup>th</sup> dose	17 <sup>th</sup> dose
Meningococcal B (MenB-4C, MenB-FHbp)	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	6 <sup>th</sup> dose	7 <sup>th</sup> dose	8 <sup>th</sup> dose	9 <sup>th</sup> dose	10 <sup>th</sup> dose	11 <sup>th</sup> dose	12 <sup>th</sup> dose	13 <sup>th</sup> dose	14 <sup>th</sup> dose	15 <sup>th</sup> dose	16 <sup>th</sup> dose	17 <sup>th</sup> dose
Pneumococcal polysaccharide (PPSV23)	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	6 <sup>th</sup> dose	7 <sup>th</sup> dose	8 <sup>th</sup> dose	9 <sup>th</sup> dose	10 <sup>th</sup> dose	11 <sup>th</sup> dose	12 <sup>th</sup> dose	13 <sup>th</sup> dose	14 <sup>th</sup> dose	15 <sup>th</sup> dose	16 <sup>th</sup> dose	17 <sup>th</sup> dose
Dengue (DENVAXYD: 9-16 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	6 <sup>th</sup> dose	7 <sup>th</sup> dose	8 <sup>th</sup> dose	9 <sup>th</sup> dose	10 <sup>th</sup> dose	11 <sup>th</sup> dose	12 <sup>th</sup> dose	13 <sup>th</sup> dose	14 <sup>th</sup> dose	15 <sup>th</sup> dose	16 <sup>th</sup> dose	17 <sup>th</sup> dose

Legend:  
 - Yellow: Range of recommended ages for all children  
 - Green: Range of recommended ages for catch-up vaccination  
 - Purple: Range of recommended ages for certain high-risk groups  
 - Orange: Recommended vaccination can begin in this age group  
 - Blue: Recommended vaccination based on shared clinical decision-making  
 - Grey: No recommendation/not applicable

- Immunization schedules for those birth through 18 years of age
  - Schedule by Vaccine and Age Group
  - Catch-Up Schedule
  - Schedule by Medical Indication
  - Addendum

• Addendum includes new or updated ACIP vaccine recommendations

- Schedule notes include information on risk groups, minimum and recommended intervals

2023 Centers for Disease Control (CDC) Child and adolescent Immunization Schedule

**Table 1** COVID-19 vaccination recommendations have changed. Find the latest recommendations at [www.cdc.gov/covidschedule](http://www.cdc.gov/covidschedule)  
**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 mos	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	← 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							
COVID-19 (1vCOV-mRNA, 2vCOV-mRNA, 1vCOV-aPS)					2- or 3- dose primary series and booster (See Notes)													
Influenza (IIV4)					Annual vaccination 1 or 2 doses													
<b>OR</b>																		
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)																		
Human papillomavirus (HPV)																		
Meningococcal (MenACWY-D ≥9 mos, MenACWY-CRM ≥2 mos, MenACWY-PTT ≥2years)				See Notes														
Meningococcal B (MenB-4C, MenB-FHbp)																		
Pneumococcal polysaccharide (PPSV23)																		
Dengue (DEN4CYD; 9-16 yrs)																		

- = Range of recommended ages for all children
- = Range of recommended ages for catch-up
- = Range of recommended ages for certain high-risk groups
- = Recommended vaccination can begin in this age group
- = Recommended based on shared clinical decision making
- = No recommendation/not applicable







	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 based on shared clinical decision-making		No recommendation/not applicable
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**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 <sup>a</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
			<15% or total CD4 cell count of <200/mm <sup>3</sup>	≥15% and total CD4 cell count of ≥200/mm <sup>3</sup>						
Hepatitis B										
Rotavirus		SCID <sup>b</sup>								
Diphtheria, tetanus, and acellular pertussis (DTaP)										
Haemophilus influenzae type b										
Pneumococcal conjugate										
Inactivated poliovirus										
COVID-19		See Notes		See Notes						
Influenza (IIV4)										
<b>or</b> Influenza (LAIV4)							Asthma, wheezing			
Measles, mumps, rubella	*									
Varicella	*									
Hepatitis A										
Tetanus, diphtheria, and acellular pertussis (Tdap)										
Human papillomavirus	*									
Meningococcal ACWY										
Meningococcal B										
Pneumococcal polysaccharide										
Dengue										

-  = Vaccination according to the routine recommended schedule
-  = 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 Notes
-  = Precaution-vaccine might be indicated if benefit of protection outweighs risk of adverse reaction
-  = Contraindicated or not recommended-vaccine should not be administered (\*Vaccinate after pregnancy)
-  = No recommendation/not applicable

 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 or vaccine. See Notes.  
 Precaution-vaccine might be indicated if benefit of protection outweighs risk of adverse reaction  
 Contraindicated or not recommended-vaccine should not be administered  
 No recommendation/not applicable  
 \*Vaccinate after pregnancy

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/hcp/acip-recs/general-recs/immunocompetence.html](http://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/immunocompetence.html) and Table 4-1 (footnote J) at [www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html](http://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html).  
 b. Severe Combined Immunodeficiency  
 c. LAIV4 contraindicated for children 2-4 years of age with asthma or wheezing during the preceding 12 months



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

• **ActHIB<sup>®</sup>, Hiberix<sup>®</sup>, Pentacel<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**

- 3-dose series 4 weeks apart after successful transplant, regardless of age

• **Anatomic or functional asplenia or 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\* persons age 12–59 months

- 1 dose

• **Elective splenectomy:**  
Unvaccinated\* persons age 12–59 months

- 1 dose (preferably at least 14 months before surgery)

• **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\* persons age 12–59 months

- 1 dose

• **Immunoglobulin deficiency or 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 14 months) OR no doses (at least 14 months)

• **Hepatitis A vaccination:**  
(minimum age: 12 months)

Age 12–59 months

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

• **Catch-up vaccination**

• Unvaccinated persons through age 59 months: a 2-dose series (minimum interval: 6 months)

• Persons who previously received 1 dose at age 12 months or older should receive dose 2

See Addendum for new or updated ACIP vaccine recommendations

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

**Additional information**

• Consult relevant ACIP 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 ≥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 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/general-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/immunocompetence.html](http://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/immunocompetence.html), and Immunization in Special Clinical Circumstances (In: Kimberlin DW, Barnett ED, Lynfield Ruth, Sawyer MH, eds. *Red Book: 2021–2024 Report 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 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.html#immunocompromised](http://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html#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/rr/r7006a1.htm?s\\_cid=rr7006a1\\_w](http://www.cdc.gov/mmwr/volumes/70/rr/r7006a1.htm?s_cid=rr7006a1_w) and [www.cdc.gov/dengue/vaccine/hcp/index.html](http://www.cdc.gov/dengue/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 Quadricel<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/rr6702a1.htm](http://www.cdc.gov/mmwr/volumes/67/rr/rr6702a1.htm).

Vaccine	Contraindicated or Not Recommended <sup>1</sup>
Dengue (DEN4CYD)	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine</li> <li>Severe immunodeficiency (e.g., hematologic and solid tumors, receipt of chemotherapy, immunodeficiency, long-term immunosuppressive therapy or patients with HIV immunocompromised)</li> <li>Lack of laboratory confirmation of a previous Dengue infection</li> </ul>
Diphtheria, tetanus, pertussis (DTaP) Tetanus, diphtheria (DT)	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine</li> <li>For DTaP only: Encephalopathy (e.g., coma, decreased level of consciousness, to another identifiable cause within 7 days of administration of previous dose)</li> </ul>
<i>Haemophilus influenzae</i> type b (Hib)	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine</li> <li>For Hiberix, ActHib, and PedvaxHIB only: History of severe allergic reaction to any component</li> <li>Less than age 6 weeks</li> </ul>
Hepatitis A (HepA)	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine</li> </ul>
Hepatitis B (HepB)	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine</li> <li>Pregnancy: <i>HepB</i> and <i>PreHevBrio</i> are not recommended due to lack of safety data for hepatitis B vaccines if HepB is indicated<sup>2</sup>.</li> </ul>
Hepatitis A–Hepatitis B vaccine (HepA–HepB, Twinrix <sup>®</sup> )	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component<sup>3</sup> including neomycin and yeast</li> </ul>
Human papillomavirus (HPV)	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine</li> <li>Pregnancy: <i>HPV</i> vaccination not recommended.</li> </ul>
Measles, mumps, rubella (MMR) Measles, mumps, rubella, and varicella (MMRV)	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine</li> <li>Severe immunodeficiency (e.g., hematologic and solid tumors, receipt of chemotherapy, congenital immunodeficiency, long-term immunosuppressive therapy or patients with HIV infection who are severely immunocompromised)</li> <li>Pregnancy</li> <li>Family history of altered immunocompetence, unless verified clinically or by laboratory testing as immunocompetent</li> </ul>
Meningococcal ACWY (MenACWY) [MenACWY-CRM (Menveo <sup>®</sup> ); MenACWY-D (Menactra <sup>®</sup> ); MenACWY-TT (MenQuadfi <sup>®</sup> )]	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine</li> <li>For MenACWY-D and Men ACWY-CRM only: severe allergic reaction to any diphtheria-toxin-containing vaccine</li> <li>For MenACWY-TT only: severe allergic reaction to a tetanus toxoid-containing vaccine</li> </ul>
Meningococcal B (MenB) [MenB-4C (Bexsero <sup>®</sup> ); MenB-FHbp (Trumenb <sup>®</sup> )]	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine</li> </ul>
Pneumococcal conjugate (PCV)	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine</li> <li>Severe allergic reaction (e.g., anaphylaxis) to any diphtheria-toxin-containing vaccine</li> </ul>
Pneumococcal polysaccharide (PPSV23) Poliovirus vaccine, inactivated (IPV)	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine</li> <li>Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine</li> </ul>
Rotavirus (RV) [RV1 (Rotarix <sup>®</sup> ), RV5 (RotaTeq <sup>®</sup> )]	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine</li> <li>Severe combined immunodeficiency (SCID)</li> <li>History of intussusception</li> </ul>
Tetanus, diphtheria, and acellular pertussis (Tdap) Tetanus, diphtheria (Td)	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine</li> <li>For Tdap only: Encephalopathy (e.g., coma, decreased level of consciousness, to another identifiable cause within 7 days of administration of previous dose)</li> </ul>
Varicella (VAR)	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine</li> <li>Severe immunodeficiency (e.g., hematologic and solid tumors, receipt of chemotherapy, congenital immunodeficiency, long-term immunosuppressive therapy or patients with HIV infection who are severely immunocompromised)</li> <li>Pregnancy</li> <li>Family history of altered immunocompetence, unless verified clinically or by laboratory testing as immunocompetent</li> </ul>

1. 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)  
 2. When a precaution is present, vaccination should generally be deferred but might be indicated if the benefit 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)  
 3. Vaccination providers should check FDA-approved prescribing information for the most complete and updated information. [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)  
 4. For information on the pregnancy exposure registries for persons who were inadvertently vaccinated with a vaccine that is contraindicated during pregnancy, visit [www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html](http://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html)

# 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/rr7101a1.htm](http://www.cdc.gov/mmwr/volumes/71/rr/rr7101a1.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, cclIV, RIV, or LAIV 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>Guillain-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 [(cclIV4), Flucelvax <sup>®</sup> Quadrivalent]	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) to any cclIV of any valency, or to any component<sup>3</sup> of cclIV4</li> </ul>	<ul style="list-style-type: none"> <li>Guillain-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 LAIV of any valency. If using cclIV4, 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>Guillain-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, cclIV, or LAIV 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, cclIV, RIV, or LAIV 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>Guillain-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>

1. 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)  
 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. 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)  
 3. 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, United States, 2023 ([cdc.gov](http://cdc.gov))**

# Child and Adolescent Immunization Schedule by Age

Recommendations for Ages 18 Years or Younger, United States, 2023

[Print](#)

! See Addendum for new or updated recommendations

[View addendum](#)

## Using the schedule

To make vaccination recommendations:

1. Determine needed vaccines based on age and risk
2. Determine appropriate intervals for vaccination
3. Assess for medical conditions and other factors
4. Review special situations ([Vaccination in Special Situations](#))
5. Review contraindications and precautions
6. See [Addendum](#) for new or updated recommendations

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

### Vaccines and Other Immunizing Agents

### Recommendations

### Effective Date of Recommendation\*

#### Respiratory syncytial virus

#### COVID-19 (Moderna, Pfizer)

### Addendum

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

In addition to the recommendations presented in the previous sections of this Immunization Schedule, ACIP has approved the following recommendations by majority vote since October 20, 2022. The following recommendations have been adopted by the CDC Director and are now official. Links are provided if these recommendations have been published in *Morbidity and Mortality Weekly Report (MMWR)*.

Vaccines and Other Immunizing Agents	Recommendation	Effective Date of Recommendation*
COVID-19 (Moderna, Pfizer-BioNTech)	<ul style="list-style-type: none"> <li>All persons ≥6 months of age should receive 2023–2024 (monovalent, XBB containing) COVID-19 vaccines as authorized under EUA or approved by BLA.</li> <li>For detailed information, see: <a href="http://www.cdc.gov/covidschedule">www.cdc.gov/covidschedule</a></li> </ul>	September 12, 2023
Respiratory syncytial virus [RSV-mAb (Nirsevimab)]	<ul style="list-style-type: none"> <li>All infants younger than 8 months and born shortly before or during the RSV season should receive 1 dose of nirsevimab within 1 week of birth either in hospital or outpatient setting</li> <li>Infants younger than age 8 months not born during RSV season and now entering their first RSV season should receive 1 dose of nirsevimab shortly before the start of RSV season</li> <li>Infants aged 8–19 months with chronic lung disease of prematurity requiring medical support (e.g., chronic corticosteroid therapy, diuretic therapy, or supplemental oxygen) any time during the 6-month period before start of the second RSV season; severe immunocompromise; cystic fibrosis with weight for length &lt;10th percentile; or with manifestation of severe lung disease (e.g., previous hospitalization for pulmonary exacerbation in the first year of life or abnormalities on chest imaging that persist when stable) should receive 1 dose of nirsevimab shortly before start of second RSV season</li> <li>Infants 8–19 months who are American Indian or Alaska Native should receive 1 dose of nirsevimab before start of second RSV season</li> <li>Infants who are age-eligible and undergoing cardiac surgery with cardiopulmonary bypass should receive 1 additional dose of nirsevimab after surgery</li> <li>For detailed information, see: <a href="http://www.cdc.gov/mmwr/volumes/72/wr/mm7234a4.htm?s_cid=mm7234a4_w">www.cdc.gov/mmwr/volumes/72/wr/mm7234a4.htm?s_cid=mm7234a4_w</a></li> </ul>	August 3, 2023
Poliovirus (IPV)	<ul style="list-style-type: none"> <li>Adolescents age 18 years who are known or suspected to be unvaccinated or incompletely vaccinated against polio should complete a primary vaccination series with inactivated polio vaccine (IPV).</li> <li>Adolescents age 18 years who have received a primary series of trivalent oral polio vaccine (tOPV) or IPV in any combination and who are at increased risk of poliovirus exposure may receive another dose of IPV. Available data do not indicate the need for more than a single lifetime booster dose with IPV for adults.</li> </ul>	June 27, 2023
Influenza (IIV4, cIV4, RIV4, LAIV4)	<ul style="list-style-type: none"> <li>All persons ages ≥6 months with egg allergy should receive influenza vaccine. Any influenza vaccine (egg based or non-egg based) that is otherwise appropriate for the recipient's age and health status can be used.</li> <li>Affirm the updated <i>MMWR</i> Recommendations and Reports, "Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices—United States, 2023–24 Influenza Season" <a href="http://www.cdc.gov/mmwr/volumes/72/rr/rr7202a1.htm">www.cdc.gov/mmwr/volumes/72/rr/rr7202a1.htm</a></li> </ul>	June 27, 2023
Pneumococcal (PCV15, PCV20)	<ul style="list-style-type: none"> <li>Use of either pneumococcal conjugate vaccines (PCV) PCV15 or PCV20 is recommended for all children aged 2–23 months according to currently recommended PCV dosing and schedules.</li> <li>For children with an incomplete PCV vaccination status, use of either PCV15 or PCV20 according to currently recommended PCV dosing and schedules is recommended for:                             <ul style="list-style-type: none"> <li>Healthy children aged 24–59 months</li> <li>Children with specified health conditions(2) aged 24 through 71 months</li> </ul> </li> <li>For children aged 2–18 years with any risk condition who have received all recommended doses of PCV before age 6 years                             <ul style="list-style-type: none"> <li>Using ≥1 dose(s) of PCV20: No additional doses of any pneumococcal vaccine are indicated. This recommendation may be updated as additional data become available.</li> <li>Using PCV13 or PCV15 (no PCV20): A dose of PCV20 or PPSV23 using previously recommended dosing and schedules is recommended.</li> </ul> </li> <li>For children aged 6–18 years with any risk condition who have not received any dose of PCV13, PCV15, or PCV20, a single dose of PCV15 or PCV20 is recommended. When PCV15 is used, it should be followed by a dose of PPSV23 at least 8 weeks later if not previously given.</li> </ul>	June 27, 2023

\*The effective date is the date when the CDC director adopted the recommendation and when the ACIP recommendation became official

# General Best Practice Guidelines for Immunization

Updated August 1, 2023

Best Practices Guidance

Kroger A, Bahta L, Long S, Sanchez P

## Introduction

Purpose and topics covered in this report...

## History

History of development of: Timing and Spacing, Contraindications and Precautions, Preventing and Managing Adverse Reactions...

## Timing and Spacing of Immunobiologics

Vaccine scheduling, supply and lapsed schedule, spacing of doses, simultaneous and nonsimultaneous administration, licensed combination vaccines, interchangeability of formulations, extra doses, conjugate vaccines...

## Contraindications and Precautions

General principles, standards of valid contraindications and precautions, and conditions incorrectly perceived as contraindications...

## Preventing and Managing Adverse Reactions

Benefit and risk communication, reporting adverse reactions, National Vaccine Injury Compensation Program...

## Vaccine Administration

Infection control and sterile technique, route of administration, multiple and jet injections. alleviating discomfort and pain, clinical implications of nonstandard practices...

TABLE 3-2. Recommended and minimum ages and intervals between vaccine doses

Vaccine and dose number	Recommended age for this dose	Minimum age for this dose	Recommended interval to next dose	Minimum interval to next dose
DTaP-1 <sup>(e)</sup>	2 months	6 weeks	8 weeks	4 weeks
DTaP-2	4 months	10 weeks	8 weeks	4 weeks
DTaP-3	6 months	14 weeks	6-12 months <sup>(f)</sup>	6 months <sup>(f)</sup>
DTaP-4	15-18 months	15 months <sup>(f)</sup>	3 years	6 months
DTaP-5 <sup>(g)</sup>	4-6 years	4 years	—	—
HepA-1 <sup>(e)</sup>	12-23 months	12 months	6-18 months	6 months
HepA-2	≥18 months	18 months	—	—
HepB-1 <sup>(h)</sup>	Birth	Birth	4 weeks-4 months	4 weeks
HepB-2	1-2 months	4 weeks	8 weeks-17 months	8 weeks
HepB-3 <sup>(i)</sup>	6-18 months	24 weeks	—	—
Hib-1 <sup>(j)</sup>	2 months	6 weeks	8 weeks	4 weeks
Hib-2	4 months	10 weeks	8 weeks	4 weeks

# 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 Age for Dose 1	Children age 4 months through 6 years				
		Dose 1 to Dose 2	Dose 2 to Dose 3	Minimum Interval Between Doses	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 the final dose is 24 weeks			
Rotavirus	6 weeks Maximum age for first dose is 14 weeks, 6 days.	4 weeks	4 weeks maximum age for final dose is 8 months, 0 days			
Diphtheria, tetanus, and acellular pertussis <i>Haemophilus influenzae</i> type b	6 weeks	4 weeks	4 weeks		6 months	6 months
Pneumococcal conjugate	6 weeks	No further doses needed if first dose was administered at age 15 months or older. 4 weeks if first dose was administered before the 1 <sup>st</sup> birthday. 8 weeks (as final dose) if first dose was administered at age 12 through 14 months.	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 first dose was administered at younger than age 7 months and at least 1 previous dose was PRP-T (ActHib®, Pentacel®, Hiberix®), Vaxelis® or unknown 8 weeks and age 12 through 59 months (as final dose) 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 second dose was administered at younger than 15 months; OR if both doses were PedvaxHIB® and were administered before the 1st birthday		8 weeks (as final dose) This dose only necessary for children age 12 through 59 months who received 3 doses before the 1 <sup>st</sup> birthday.	
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)	
Measles, mumps, rubella	12 months	4 weeks				
Varicella	12 months	3 months				
Hepatitis A	12 months	6 months				
Meningococcal ACWY	2 months MenACWY-CRM 9 months MenACWY-D 2 years MenACWY-TT	8 weeks	See Notes		See Notes	
<b>Children and adolescents age 7 through 18 years</b>						
Meningococcal ACWY	Not applicable (N/A)	8 weeks				
Tetanus, diphtheria; tetanus, diphtheria, and acellular pertussis	7 years	4 weeks	4 weeks if first dose of DTaP/DT was administered before the 1 <sup>st</sup> birthday 6 months (as final dose) 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	Routine dosing intervals are recommended.				
Hepatitis A	N/A	6 months				
Hepatitis B	N/A	4 weeks	8 weeks and at least 16 weeks after first dose			
Inactivated poliovirus	N/A	4 weeks	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 third dose was administered <6 months after the second dose.	
Measles, mumps, rubella	N/A	4 weeks				
Varicella	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			

[Recommended Child and Adolescent Immunization Schedule, United States, 2023 \(cdc.gov\)](https://www.cdc.gov/vaccines/imz/downloads/pdf/23-0101.pdf)

# Other Catch-Up Resources

Catch-Up Guidance for Children 4 Months through 6 Months of Age		Catch-Up Guidance for Children 4 Months through 6 Months of Age		Catch-Up Guidance for Children 4 Months through 6 Months of Age		Catch-Up Guidance for Children 7 through 9 Years of Age																																																																																											
Haemophilus influenzae type b (Hib) and ActHIB, Hiberix		Pneumococcal		Diphtheria-, Tetanus-, and Pertussis-Containing Vaccines: DTaP or D		Tetanus-, Diphtheria-, and Pertussis-Containing Vaccines: Tdap/Td <sup>1</sup>																																																																																											
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Revised February 2023		Revised February 2023		Revised February 2023		Revised February 2023																																																																																											

Download "CDC Vaccine Schedules" free for iOS and Android devices.




**Product Specs**  
Version: 10.0.1

**Requirements:** Requires iOS 11.0 or later and Android 5.1 or later; optimized for tablets and useful on smartphones.

**Updates:** Changes in the app are released through app updates.

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[www.cdc.gov/vaccines/schedules/hcp/imz/catchup.html#guidance](http://www.cdc.gov/vaccines/schedules/hcp/imz/catchup.html#guidance)

# COVID-19 Vaccine Clinical Considerations

## Interim Clinical Considerations for Use of COVID-19

### Vaccines in the United States

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#### Summary of recent changes (last updated October 24, 2023):

- Age transitions: Updated guidance for children who transition during the initial COVID-19 vaccination series from age 6 months to age 4 years to age 5 years and children who are moderately or severely immunocompromised from age 6 months to age 4 years to age 5 years to age 12 years to receive the age-appropriate dosage based on their age on the day of vaccination.
- Interchangeability of COVID-19 vaccines: Clarification of circumstances in which additional doses from different manufacturers may be considered when doses from the same manufacturer are recommended.

#### Reference Materials

- [COVID-19 Vaccination Recommendations Infographic \(Updated 10/13/2023\)](#)
- [COVID-19 Vaccination Recommendations Infographic \(Immunocompromised\) \(Updated 10/13/2023\)](#)

Ages 6 months–4 years

COVID-19 vaccination history prior to updated (2023–2024 Formula) mRNA vaccine*	Number of updated (2023–2024 Formula) mRNA vaccine	Vaccine vial
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Ages 5–11 years†

COVID-19 vaccination history prior to updated (2023–2024 Formula) mRNA vaccine*	Updated (2023–2024 Formula) mRNA vaccine	Number of updated (2023–2024 Formula) mRNA doses indicated	Dosage (mL/ug)	Vaccine vial cap and label colors	Interval between doses
Unvaccinated	Moderna	1	0.25 mL/25 ug	Dark blue cap; green label	—
	Pfizer-BioNTech	1	0.3 mL/10 ug	Blue cap; blue label	—
1 or more doses any mRNA	Moderna OR	1	0.25 mL/25 ug	Dark blue cap; green label	At least 8 weeks after last dose
	Pfizer-BioNTech	1	0.3 mL/10 ug	Blue cap; blue label	At least 8 weeks after last dose



# Pediatric Case Studies





# Case Study 1: Noah

DOB: 6-2-23

Age: 5 months

- Healthy 5-month-old
- Weight today: 10 lbs. 10 oz.
- Received first HepB in the hospital on 6-2-23
- Has not received any other vaccines
- No contraindications or precautions to any vaccines
- Does not have any high-risk indications

# NOAH'S MCIR RECORD:

Series	Immunizations						Oth
	Dose 1	Dose 2	Dose 3	Dose 4	Dose 5	Dose 6+	
DTP/DTaP/ DT/Td/Tdap							
Polio							
MMR							
Hib							
Hepatitis B	06/02/2023 Hep B (ped/adol)						
Varicella							
Pneumococcal Conjugate							
Hepatitis A							
Seasonal Influenza							
SARS-CoV-2							
RSV							

# Case Study #1: Noah

## Question #1:

Which vaccines should Noah receive today?

- A. HepB, Rotavirus (RV), DTaP, Hib, Polio
- B. HepB, DTaP, Hib, Pneumococcal, Polio, Nirsevimab (RSV)
- C. HepB, RV, Pneumococcal, Nirsevimab (RSV)
- D. HepB, RV, DTaP, Hib, Pneumococcal, Polio, Nirsevimab(RSV)
- E. None of the above



# Question #1: Answer: B

- Hep B
- DTaP
- Hib
- Pneumococcal
- Polio
- Nirsevimab (RSV)

\*Using combination vaccines equals fewer shots:

- Pediarix (DTaP/IPV/HepB) **OR**
- Pentacel (DTaP/IPV/Hib) **OR**
- Vaxelis (DTaP/IPV/Hib/HepB)



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! See Addendum for new or updated ACIP vaccine recommendations.

### Addendum - Child and Adolescent Recommendation Schedule for ages 18 years or younger

# Healthcare Providers: RSV Prevention Information

## RSV Immunization for Infants and Young Children

[Print](#)

### Vaccines and Other Immunizing Agents

Vaccines and Other Immunizing Agents	Recommendations
Respiratory syncytial virus [RSV-mAb (Nirsevimab)]	<ul style="list-style-type: none"> <li>All infants and born during the RSV season should receive 1 dose of nirsevimab shortly before the start of birth episode for outpatients.</li> </ul>

- Infants younger than age 8 months not born during RSV season and now entering their first RSV season should receive 1 dose of nirsevimab shortly before the start of RSV season.



On October 23, 2023, CDC released a health advisory notice to communicate interim recommendations regarding the limited supply of nirsevimab, the new preventive antibody to protect infants against severe RSV.

Read more: [Limited Availability of Nirsevimab in the United States—Interim CDC Recommendations](#)

# Case Study: Noah

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos
Hepatitis B (HepB)	1 <sup>st</sup> dose	← 2 <sup>nd</sup> dose →		★	
Rotavirus (RV): RV1 (2-dose series), RV5 (3-dose series)			1 <sup>st</sup> dose	★	See Notes
Diphtheria, tetanus, acellular pertussis (DTaP <7 yrs)			1 <sup>st</sup> dose	★	3 <sup>rd</sup> dose
Haemophilus influenzae type b (Hib)			1 <sup>st</sup> dose	★	See Notes
Pneumococcal conjugate (PCV13, PCV15)			1 <sup>st</sup> dose	★	3 <sup>rd</sup> dose
Inactivated poliovirus (IPV <18 yrs)			1 <sup>st</sup> dose	★	
COVID-19 (1vCOV-mRNA, 2vCOV-mRNA, 1vCOV-aPS)					
Influenza (IIV4)					
Influenza (LAIV4)					
Measles, mumps, rubella (MMR)					
Varicella (VAR)					
Hepatitis A (HepA)					
Tetanus, diphtheria, acellular pertussis (Tdap ≥7 yrs)					
Human papillomavirus (HPV)					
Meningococcal (MenACWY-D ≥9 mos, MenACWY-CRM ≥2 mos, MenACWY-TT ≥2years)					
Meningococcal B (MenB-4C, MenB-FHbp)					
Pneumococcal polysaccharide (PPSV23)					
Dengue (DEN4CYD; 9-16 yrs)					

★ = vaccines that were recommended for 2 months of age

Vaccine	Minimum Age for Dose 1	Children age 4 months through 6 years	
		Dose 1 to Dose 2	Dose 2 to Dose 3
Hepatitis B	Birth	4 weeks	4 weeks
Rotavirus	6 weeks Maximum age for first dose is 14 weeks, 6 days	4 weeks	4 weeks
Diphtheria, tetanus, and acellular pertussis	6 weeks	4 weeks	4 weeks
Haemophilus influenzae type b	6 weeks	No further doses needed if first dose was administered at age 15 months or older. 4 weeks if first dose was administered before the 1 <sup>st</sup> birthday. 8 weeks (as final dose) if first dose was administered at age 12 through 14 months.	No further doses needed if previous dose was administered at age 15 months or older. 4 weeks if current age is 12 months or older and previous dose was administered at age 12 months or older. 8 weeks and age 12 months (as final dose) if current age is 12 months or older and previous dose was administered at age 12 months or older. OR 4 weeks if current age is 12 months or older and previous dose was administered at age 12 months or older. 8 weeks (as final dose) if previous dose was administered at age 12 months or older. OR 4 weeks if current age is 12 months or older.
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 first dose was administered before the 1 <sup>st</sup> birthday. 8 weeks (as final dose for healthy children) if first dose was administered at the 1 <sup>st</sup> 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 12 months or older and previous dose was administered at age 12 months or older. 8 weeks (as final dose) if previous dose was administered at age 12 months or older. OR 4 weeks if current age is 12 months or older.
Inactivated poliovirus	6 weeks	4 weeks	4 weeks if current age is <4 months. 6 months (as final dose) if current age is 4 years or older.
Measles, mumps, rubella	12 months	4 weeks	
Varicella	12 months	3 months	
Hepatitis A	12 months	6 months	
Meningococcal ACWY	2 months MenACWY-CRM 9 months MenACWY-D 2 years MenACWY-TT	8 weeks	See Notes

Rotavirus  
6 weeks  
Maximum age for first dose is 14 weeks, 6 days.

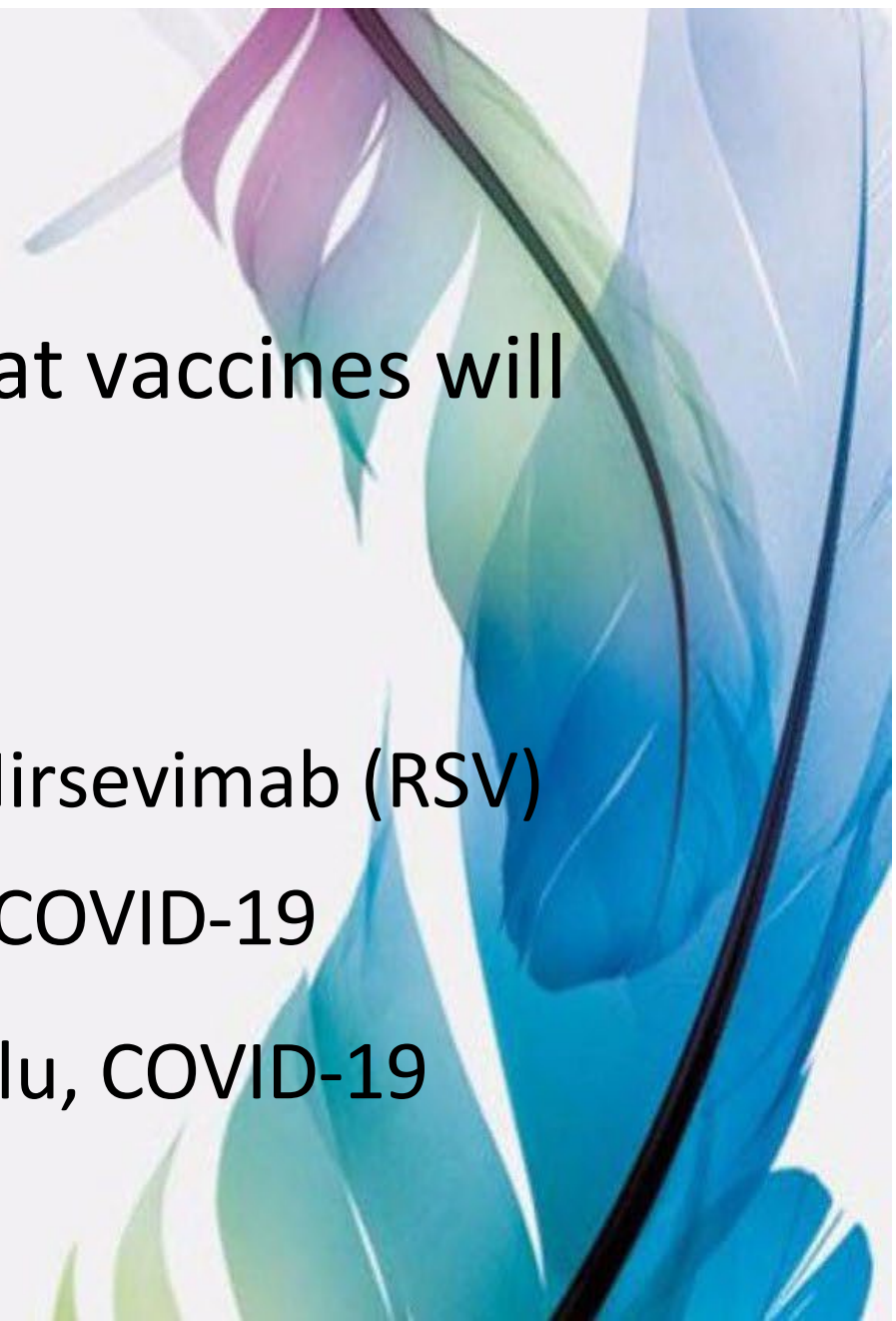
- Use catch-up schedule to determine:
- Maximum/minimum age for the 2-month vaccines to be given today
  - Minimum interval between 2-month doses and next dose

# Case Study: Noah

## Question #2:

When does Noah need to return and what vaccines will he need at that time?

- A. 2-3 months: Hep B, DTaP, IPV, Flu
- B. 1 month: DTaP, Hib, IPV, Pneumococcal, Nirsevimab (RSV)
- C. 2 months: DTaP, Hib, Pneumococcal, IPV, COVID-19
- D. 1 month: DTaP, Hib, Pneumococcal, IPV, Flu, COVID-19
- E. None of the above



# Question #2: Answer: D- 1 month

- DTaP
- Hib
- Pneumococcal
- IPV
- Flu
- COVID-19

\*Using combination vaccines equals fewer shots

- Pediarix (DTaP, IPV, Hep B) **OR**
- Pentacel (DTaP, IPV, Hib) **OR**
- Vaxelis (DTaP/IPV/Hib/Hep B)





# NOAH'S MCIR RECORD:

Series	Immunizations				Other	
	Dose 1	Dose 2	Dose 3	Dose 4	Dose 5	Dose 6+
DTP/DTaP/ DT/Td/Tdap	11/03/2023 DTaP-Hep B-IPV (Pediatrix) 5mos 1dy					
Polio	11/03/2023 DTaP-Hep B-IPV (Pediatrix) 5mos 1dy					
MMR						
Hib	11/03/2023 Hib (historical) 5mos 1dy					
Hepatitis B	06/02/2023 Hep B (ped/adol)	11/03/2023 DTaP-Hep B- IPV (Pediatrix) 5mos 1dy				
Varicella						
Pneumococcal Conjugate	11/03/2023 PCV15 (VAXNEUVANCE) 5mos 1dy					
Hepatitis A						
Seasonal Influenza						
SARS-CoV-2						
RSV	11/03/2023 RSV Nirsevimab(Beyfortus)0.5ml 5mos 1dy					

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos
Hepatitis B (HepB)	1 <sup>st</sup> dose	← 2 <sup>nd</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	★
Haemophilus influenzae type b (Hib)			1 <sup>st</sup> dose	2 <sup>nd</sup> dose	★
Pneumococcal conjugate (PCV13, PCV15)			1 <sup>st</sup> dose	2 <sup>nd</sup> dose	★
Inactivated poliovirus (IPV <18 yrs)			1 <sup>st</sup> dose	2 <sup>nd</sup> dose	★
COVID-19 (1vCOV-mRNA, 2vCOV-mRNA, 1vCOV-aPS)					★
Influenza (IIV4)					★
<b>OR</b>					
Influenza (LAIV4)					
Measles, mumps, rubella (MMR)					See Notes
Varicella (VAR)					
Hepatitis A (HepA)					See Notes
Tetanus, diphtheria, acellular pertussis (Tdap ≥7 yrs)					
Human papillomavirus (HPV)					
Meningococcal (MenACWY-D ≥9 mos, MenACWY-CRM ≥2 mos, MenACWY-TT ≥2 years)					
Meningococcal B (MenB-4C, MenB-FHbp)					
Pneumococcal polysaccharide (PPSV23)					
Dengue (DEN4CYD; 9-16 yrs)					

Range of recommended ages for all children
  Range of recommended ages for catch-up vaccination
  Range of recon for certain high

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
Hepatitis B			<b>Dose 2 to Dose 3</b> <b>8 weeks and at least 16 weeks after first dose</b> <b>minimum age for the final dose is 24 weeks</b>
Rotavirus	6 weeks Maximum age for first dose is 14 weeks, 6 days.	4 weeks	
Diphtheria, tetanus, and acellular pertussis	6 weeks	4 weeks	4 weeks
Haemophilus influenzae type b	6 weeks	<b>No further doses needed</b> if first dose was administered at age 15 months or older. <b>4 weeks</b> if first dose was administered before the 1 <sup>st</sup> birthday. <b>8 weeks (as final dose)</b> if first dose was administered at age 12 through 14 months.	<b>No further doses needed</b> if previous dose was administered at age 15 months or older <b>4 weeks</b> if current age is younger than 12 months <b>and</b> first dose was administered at younger than age 7 months <b>and</b> at least 1 previous dose was PRP-T (ActHib®, Pentacel®, Hiberix®), Vaxelis® or unknown <b>8 weeks and age 12 through 59 months (as final dose)</b> if current age is younger than 12 months <b>and</b> first dose was administered at age 7 through 11 months; OR if current age is 12 through 59 months <b>and</b> first dose was administered before the 1 <sup>st</sup> birthday <b>and</b> second dose was administered at younger than 15 months; OR if both doses were PedvaxHIB® and were administered before the 1st birthday
Pneumococcal conjugate	6 weeks	<b>No further doses needed</b> for healthy children if first dose was administered at age 24 months or older <b>4 weeks</b> if first dose was administered before the 1 <sup>st</sup> birthday <b>8 weeks (as final dose for healthy children)</b> if first dose was administered at the 1 <sup>st</sup> birthday or after	<b>No further doses needed</b> for healthy children if previous dose was administered at age 24 months or older <b>4 weeks</b> if current age is younger than 12 months and previous dose was administered at <7 months old <b>8 weeks (as final dose for healthy children)</b> if previous dose was administered 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 administered before age 12 months
Inactivated poliovirus	6 weeks	4 weeks	<b>4 weeks</b> if current age is <4 years <b>6 months (as final dose)</b> if current age is 4 years or older

## Influenza vaccination

(minimum age: 6 months [IIV], 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**

## 2023-24 Seasonal Influenza Vaccine Dose Volumes for Children

Everyone aged 6 months and older should receive flu vaccine every year.

Flu vaccine dose volume is based on the person's **age and the flu vaccine product** that is used.<sup>1</sup> Among vaccine errors reported between June 2020 and December 2021, wrong vaccine (24%) and wrong age (13%) were listed as numbers 1 and 3 of the most frequent types of vaccine events other than those related to COVID-19 vaccines. Wrong age and associated wrong dose errors occurred frequently between age-related formulations of influenza vaccines (31%).<sup>2</sup> It is important to prevent flu vaccine administration errors to ensure children are adequately protected against flu.

For children aged **6 through 35 months**, flu vaccine dose volume is **dependent on the product that is administered**. There are multiple licensed inactivated influenza vaccines, quadrivalent (IIV4) available for children aged 6 through 35 months: Afluria<sup>®</sup> Quadrivalent, FluLaval<sup>®</sup> Quadrivalent, Fluarix<sup>®</sup> Quadrivalent, and Fluzone<sup>®</sup> Quadrivalent. The cell cultured-based inactivated influenza vaccine (ccIIV4) is available for persons aged 6 months and older (Flucelvax<sup>®</sup> Quadrivalent).

If You're Using This Vaccine (IIV4)... <sup>1</sup>	Dose Volume for Ages 6-35 Months
Afluria (Seqirus)	0.25 mL per dose
Fluarix or FluLaval (GSK)	0.5 mL per dose
Fluzone (Sanofi Pasteur)	0.25 mL OR 0.5 mL per dose *No preference is expressed for either dose volume.
If You're Using This Vaccine (ccIIV4)... <sup>1</sup>	Dose Volume for Ages 6-35 Months
Flucelvax (Seqirus)	0.5mL per dose

Refer to the Flu Vaccine Presentation Chart<sup>1</sup> for available presentations of each of these vaccines.

**Children aged 3 years and older, dose volume for standard-dose IIV is 0.5 mL regardless of the flu vaccine product being administered.**

If 2 doses of 2023-24 flu vaccine are needed<sup>3</sup>, the same vaccine product **does not** need to be used for both doses. Use any age-appropriate flu vaccine that is available that day, ensuring you use the correct dose volume for the product you are administering.

Do not miss an opportunity to vaccinate! Dose volume is based on the child's age on the day of vaccine administration. For example:

If a child is aged **2 years and 11 months** for dose 1, use the above table to determine dose volume based on the **IIV/ccIIV product used**. When the child returns 4 weeks later for dose 2 and is **now aged 3 years**, the dose volume is **0.5 mL** regardless of the IIV/ccIIV product used.

For children aged 6 through 35 months, the needed volume for a child aged 6 through 35 months may be administered from a prefilled syringe containing the appropriate volume (as supplied by the manufacturer), a single-dose vial, or a multi-dose vial.

For Guidance on Fluzone Quadrivalent:

NOTE: Fluzone Quadrivalent is approved for children aged 6 through 35 months at either 0.25 mL or 0.5 mL per dose. The 0.25-mL prefilled syringe of Fluzone Quadrivalent is no longer available. If a prefilled syringe of Fluzone Quadrivalent is used for a child in this age group, the dose volume will be 0.5 mL per dose.

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## Volumes for Children

for only 1 dose. If 0.25 mL is used, 0.25 mL remaining in the single-dose vial

administration errors<sup>4,5</sup>:

Fluarix rather than the

0.25 mL dose of the product that was discovered until the following day, 0.5 mL of FluLaval, Fluarix, or Revaccinating the day after the initial error.

single-dose vial rather than the

0.25 mL dose as valid. Notify the parent/guardian of the vaccine administration errors. If the error is discovered after an age-appropriate IIV dose (use 0.25 mL for children 6 months and older may receive LAIV4

rather than the recommended 0.5 mL

0.25 mL dose of Afluria to correct this error. The child should be revaccinated the 5-year-old child after the initial substandard dose if the child is a healthy child aged 2 years and

<https://www.michigan.gov/flu/resources/resources-for-health-professionals>

<https://www.michigan.gov/flu/resources/resources-for-health-professionals/ismmp-national-vaccine-errors>

<https://www.michigan.gov/flu/resources/resources-for-health-professionals>

Vaccine Error Reporting System (VAERS): <https://vaers.hhs.gov/> so the status of the error can be

<https://www.fda.gov/advisory-committees/advisory-committee-on-injectable-drugs> and <https://www.cdc.gov/vaccines/imz/qa/2023-08-25-2023-24-flu-vaccine-dose-volumes-for-children.html>

[www.cdc.gov/vaccines](https://www.cdc.gov/vaccines), or

For more information on vaccine errors, visit [Immunize.org](https://www.immunize.org)'s Ask the

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## Ages 6 months–4 years

COVID-19 vaccination history prior to updated (2023–2024 Formula) mRNA vaccine*	Updated (2023–2024 Formula) mRNA vaccine	Number of updated (2023–2024 Formula) mRNA vaccine doses indicated	Dosage (mL/ug)	Vaccine vial cap and label colors	Interval between doses
Unvaccinated	Moderna	2	0.25 mL/25 ug	Dark blue cap; green label	Dose 1 and Dose 2: 4–8 weeks <sup>†</sup>
	Pfizer-BioNTech	3	0.3 mL/3 ug	Yellow cap; yellow label	Dose 1 and Dose 2: 3–8 weeks <sup>†</sup> Dose 2 and Dose 3: At least 8 weeks

[Interim Clinical Considerations for Use of COVID-19 Vaccines | CDC](#)

[Resources for Health Professionals \(michigan.gov\)](#)



## Case Study 2: Winnie

DOB: 5-9-12

Age: 11 years

- Healthy 11-year-old
- Has egg allergy:
  - Hives
  - Nasal congestion
  - Vomiting
- No contraindications or precautions to any vaccines
- Does not have any high-risk indications

# WINNIE'S MCIR RECORD:

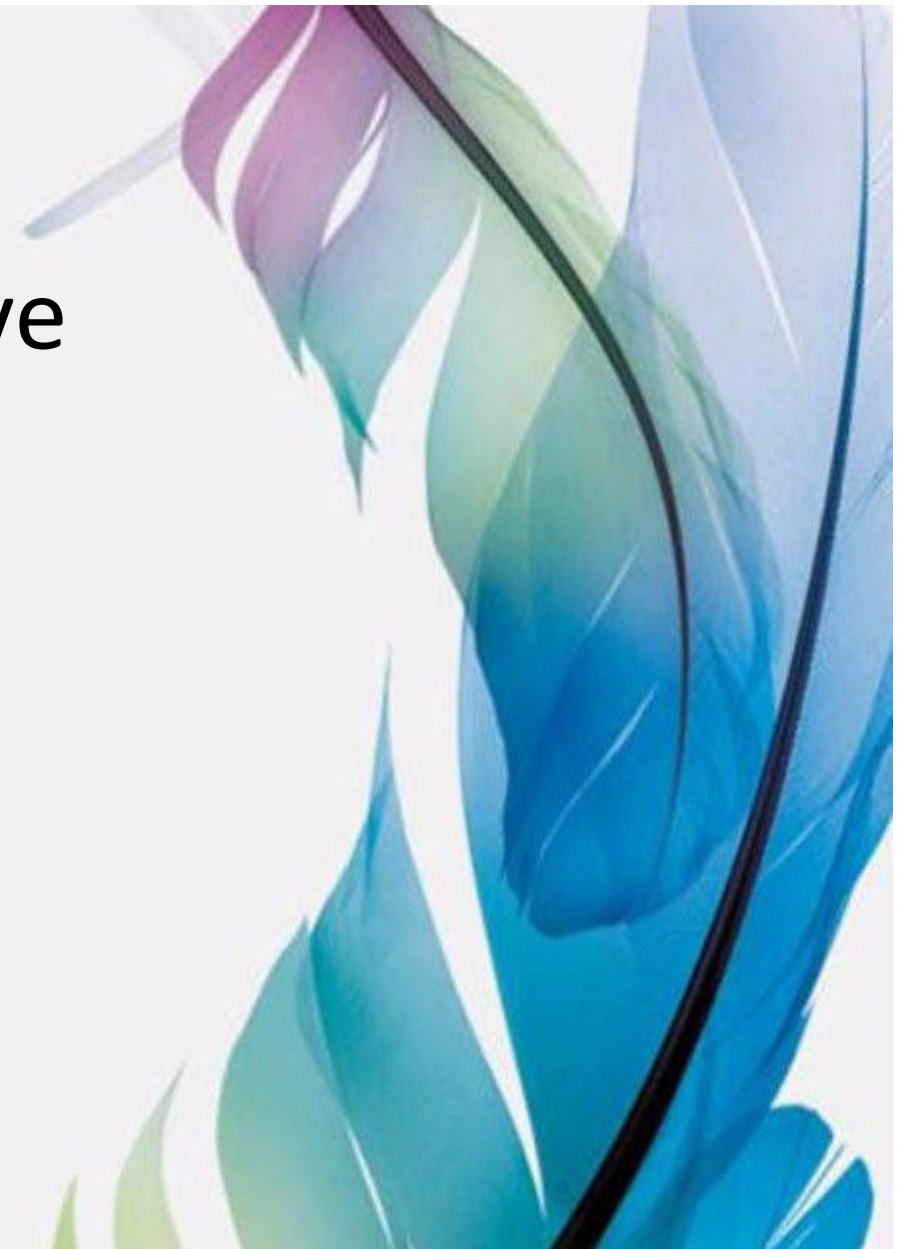
Series	Immunizations					Other
	Dose 1	Dose 2	Dose 3	Dose 4	Dose 5	Dose 6+
<b>DTP/DTaP/DT/Td/Tdap</b>	07/10/2012 DTaP-Hep B-IPV (Pediarix) 2mos 1dy	09/11/2012 DTaP-Hep B-IPV (Pediarix) 4mos 2dys	11/12/2012 DTaP-Hep B-IPV (Pediarix) 6mos 3dys	09/09/2013 DTaP (pediatric) 1yr 4mos	08/05/2019 Tdap (adol/adult) 7yrs 2mos	
<b>Polio</b>	07/10/2012 DTaP-Hep B-IPV (Pediarix) 2mos 1dy	09/11/2012 DTaP-Hep B-IPV (Pediarix) 4mos 2dys	11/12/2012 DTaP-Hep B-IPV (Pediarix) 6mos 3dys	08/05/2019 IPV (polio) 7yrs 2mos		
<b>MMR</b>	05/13/2013 MMR 1yr	08/05/2019 MMRV (ProQuad) 7yrs 2mos				
<b>Hepatitis B</b>	05/10/2012 Hep B (ped/adol) 1dy	07/10/2012 DTaP-Hep B-IPV (Pediarix) 2mos 1dy	11/12/2012 DTaP-Hep B-IPV (Pediarix) 6mos 3dys			
<b>Varicella</b>	05/13/2013 Varicella (Varivax) 1yr	08/05/2019 MMRV (ProQuad) 7yrs 2mos				
<b>HPV</b>						
<b>Hepatitis A</b>	05/13/2013 Hep A (ped/adol) 1yr	12/09/2013 Hep A (ped/adol) 1yr 7mos				
<b>Seasonal Influenza</b>	11/12/2012 Influenza (Historical) 6mos 3dys	12/17/2012 Influenza (Historical) 7mos 8dys	09/13/2013 Influenza (Historical) 1yr 4mos	10/10/2014 Influenza (Historical) 2yrs 5mos	10/13/2015 Influenza (Historical) 3yrs 5mos	
<b>Meningococcal Conjugate</b>						
<b>SARS-CoV-2</b>						

# Case Study #2: Winnie

## Question #1:

Which vaccines should Winnie receive today?

- A. Tdap, HPV, MenACWY, Flu, and COVID-19
- B. HPV, MenB, MenACWY, and Tdap
- C. MenB, COVID-19, and HPV
- D. Td, MenACWY, Flu, and COVID-19
- E. None of the above



# Question #1: Answer: A

- Tdap
- HPV
- MenACWY
- Flu
- COVID-19



**Table 1**

See Addendum for new or updated ACIP vaccine recommendations

**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 mos	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	← 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-aPS)										2- or 3- dose primary series and booster (See Notes)				★			
Influenza (IIV4)										Annual vaccination 1 or 2 doses				★	Annual vaccination 1 dose only		
<b>OR</b> Influenza (LAIV4)												Annual vaccination 1 or 2 doses	<b>OR</b>	★	Annual vaccination 1 dose only		
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)														★			
Human papillomavirus (HPV)														★			
Meningococcal (MenACWY-D ≥9 mos, MenACWY-CRM ≥2 mos, MenACWY-TT ≥2years)							See Notes							★		2 <sup>nd</sup> dose	
Meningococcal B (MenB-4C, MenB-FHbp)																	
Pneumococcal polysaccharide (PPSV23)																	
Dengue (DEN4CYD; 9-16 yrs)																	★

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 based on shared clinical decision-making
No recommendation/not applicable

[0-18yrs-child-combined-schedule.pdf \(cdc.gov\)](https://www.cdc.gov/0-18yrs-child-combined-schedule.pdf)



## Notes

### Meningococcal serogroup A,C,W,Y vaccination (minimum age: 2 months [MenACWY-CRM, Menveo], 9 months [MenACWY-D, Menactra], 2 years [MenACWY-TT, MenQuadfi])

#### Routine vaccination

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

### 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\* 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.

### Meningococcal serogroup B vaccination (minimum age: 10 years [MenB-4C, Bexsero®; MenB-FHbp, Trumenba®])

#### 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®:** 2-dose series at least 1 month apart
  - **Trumenba®:** 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:**

- **Be...**
  - **Tr...**
- MenB is shared clinical decision-making for adolescents aged 16 through 23 years that are not at increased risk. For High-Risk patients see Immunization Schedule footnotes.
- For... listed under "Special situations" and in an outbreak setting and additional meningococcal vaccination information, see [www.cdc.gov/mmwr/volumes/69/rr/rr6909a1.htm](http://www.cdc.gov/mmwr/volumes/69/rr/rr6909a1.htm).

## Routine Recommendations for Meningococcal Vaccines<sup>1</sup>

Vaccine Type	Brand Names	Routine Recommendation for People Who Are Not in a Risk Group <sup>1,2,3</sup>	General Guidelines
MenACWY <sup>2</sup>	Menactra® MenQuadfi® Menveo®	One dose at age 11-12 years; booster dose at age 16 years	<ul style="list-style-type: none"> <li>• 1 dose <b>required</b><sup>4</sup> at 11 years of age or older upon entry into 7<sup>th</sup> grade or higher</li> <li>• Products are interchangeable if age appropriate, but same vaccine is recommended for complete series</li> <li>• Intramuscular injection</li> </ul>
MenB <sup>3</sup>	Bexsero® Trumenba®	Shared clinical decision making for persons 16 years through 23 years without high-risk conditions: <ul style="list-style-type: none"> <li>• Bexsero: 2 dose series at least 1 month apart <b>OR</b></li> <li>• Trumenba: 2 dose series at least 6 months apart</li> </ul>	<ul style="list-style-type: none"> <li>• Products are <b>not</b> interchangeable</li> <li>• Intramuscular injection</li> <li>• MenB vaccine is <b>not</b> routinely recommended at 11-12 years of age</li> </ul>

<sup>1</sup> For Child and Adolescent Immunization Schedule by Age at: [www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html](http://www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html)

<sup>2</sup> For more information regarding Meningococcal Conjugate Vaccine (MenACWY), including guidance for catch-up and for persons who are at high-risk, refer to the Meningococcal Conjugate Quick Look at: [www.michigan.gov/vaccinequicklooks](http://www.michigan.gov/vaccinequicklooks) and Immunize.org's handout titled, "Meningococcal ACWY vaccine recommendations by Age and Risk Factor" at: [www.immunize.org/catg.d/p2018.pdf](http://www.immunize.org/catg.d/p2018.pdf)

<sup>3</sup> For more information regarding Meningococcal Serogroup B (MenB), including guidance for catch-up and for persons who are at high-risk, refer to the Meningococcal Serogroup B Quick Look at: [www.michigan.gov/vaccinequicklooks](http://www.michigan.gov/vaccinequicklooks) and Immunize.org's handout titled, "Meningococcal B Vaccine Recommendations by Age and Risk Factor" at: [www.immunize.org/catg.d/p2035.pdf](http://www.immunize.org/catg.d/p2035.pdf)

<sup>4</sup> For vaccines required for school entry in Michigan, refer to "Vaccines Required for School Entry in Michigan" at: [https://mcir.org/wp-content/uploads/2021/08/SchoolEntryReqVaccinesParentsMI\\_5.3.2021approvedfinalpublish.pdf](https://mcir.org/wp-content/uploads/2021/08/SchoolEntryReqVaccinesParentsMI_5.3.2021approvedfinalpublish.pdf)

[Routine-Recommendations-for-Meningococcal-Vaccines\\_5-25-23\\_FINAL.pdf \(michigan.gov\)](#)

Ages 5–11 years<sup>‡</sup>

COVID-19 vaccination history prior to updated (2023–2024 Formula) mRNA vaccine*	Updated (2023–2024 Formula) mRNA vaccine	Number of updated (2023–2024 Formula) mRNA doses indicated
Unvaccinated	Moderna	1
	Pfizer-BioNTech	1
1 or more doses any mRNA	Moderna OR	1
	Pfizer-BioNTech	1

[Interim Clinical Considerations for Use of COVID-19 Vaccines | CDC](#)

**Points to consider for the 2023-24 Influenza Season**

- For a complete list of contraindications and precautions for influenza vaccines review the Quick Looks for:
  - Egg-based
  - ccIIIV4:
  - RIV4:
- Influenza vaccine
  - Inactivated
  - Recombinant
  - Live Attenuated
  - Cell Culture
- Severe allergic component
- With the exception of growing virus
- Tolerance to
- For clinics that for maintain how to use
  - Emergency airway
  - Refer to at [http://](#)
- For persons doses of influenza flu product
- No post-vaccination persons; however, minutes after syncope occur

[Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices — United States, 2023–24 Influenza Season Recommendations and Reports / August 25, 2023 / 72\(2\);1–25](#) regarding flu vaccination

**2023-24 Influenza Vaccination for Persons Who Report Egg Allergy**

**For the 2023-24 influenza season, the Advisory Committee on Immunization Practices (ACIP) recommends the following:**

- All persons aged 6 months and older with egg allergy should receive influenza vaccine
  - Any influenza vaccine (egg based or nonegg based) that is otherwise appropriate for the recipient's age and health status can be used (i.e., any IIV4, RIV4, or LAIV4)
- Egg allergy in and of itself necessitates no additional safety measures for influenza vaccination beyond those recommended for any recipient of any vaccine, regardless of severity of previous reaction to egg
- Severe and life-threatening reactions to vaccines can rarely occur with any vaccine and in any vaccine recipient, regardless of allergy history. All vaccines should be administered in settings in which personnel and equipment needed for rapid recognition and treatment of acute hypersensitivity reactions are available
  - All vaccination providers should be familiar with their office emergency plan and be certified in cardiopulmonary resuscitation (CPR)

**Remember:**

It is important to screen and review the contraindications and precautions for any vaccine. With flu vaccine it is important to know the type of flu vaccine being administered to assess for vaccine specific contraindications and precautions

- For further information on contraindications and precautions review the Quick Looks for Influenza Vaccines (IIV4, LAIV4, ccIIIV4, and RIV4) at: [www.Michigan.gov/vaccinequicklooks](http://www.Michigan.gov/vaccinequicklooks)

[Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices — United States, 2023–24 Influenza Season Recommendations and Reports / August 25, 2023 / 72\(2\);1–25](#), located at [www.cdc.gov/vaccines/hcp/acip-recs/index.html](http://www.cdc.gov/vaccines/hcp/acip-recs/index.html). For further information regarding flu vaccination, refer to [www.Michigan.gov/flu](http://www.Michigan.gov/flu), [www.cdc.gov/vaccines](http://www.cdc.gov/vaccines), or [www.cdc.gov/mmwr](http://www.cdc.gov/mmwr).

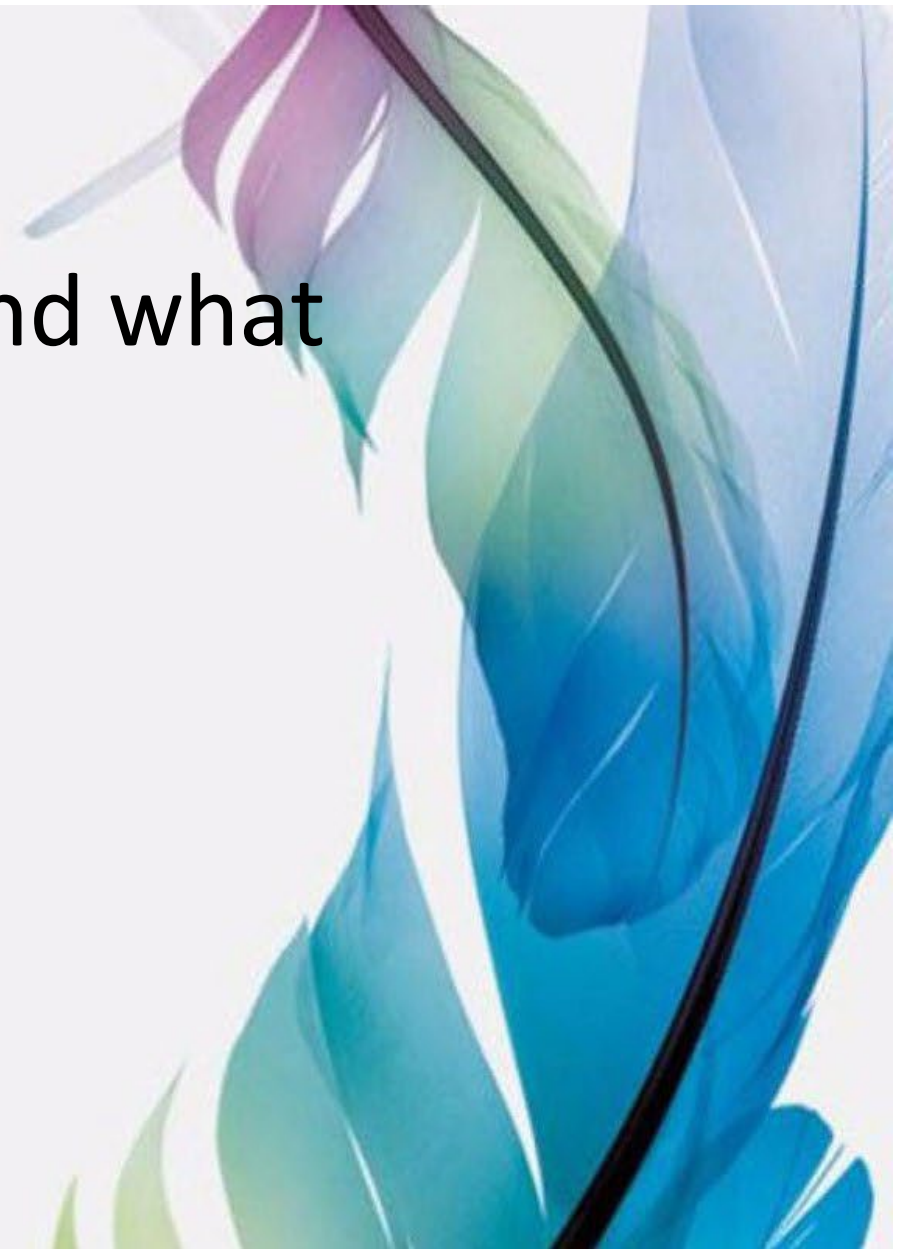
[Resources for Health Professionals \(michigan.gov\)](http://michigan.gov)

# Case Study #2: Winnie

## Question #2:

When does Winnie need to return and what vaccines will she need at that time?

- A. 1 month: MenACWY, HPV, and Flu
- B. 1 month: MenB, and HPV
- C. 6 months: HPV
- D. 4-8 weeks: HPV, and COVID-19
- E. None of the above



# Answer: C

- 6 months: HPV



# WINNIE'S MCIR RECORD:

Series	Immunizations				Other	
	Dose 1	Dose 2	Dose 3	Dose 4	Dose 5	Dose 6+
<b>DTP/DTaP/ DT/Td/Tdap</b>	07/10/2012 DTaP-Hep B- IPV (Pediarix) 2mos 1dy	09/11/2012 DTaP-Hep B- IPV (Pediarix) 4mos 2dys	11/12/2012 DTaP-Hep B- IPV (Pediarix) 6mos 3dys	09/09/2013 DTaP (pediatric) 1yr 4mos	08/05/2019 Tdap (adol/adult) 7yrs 2mos	09/26/2023 Tdap (adol/adult) 11yrs 4mos
<b>Polio</b>	07/10/2012 DTaP-Hep B- IPV (Pediarix) 2mos 1dy	09/11/2012 DTaP-Hep B- IPV (Pediarix) 4mos 2dys	11/12/2012 DTaP-Hep B- IPV (Pediarix) 6mos 3dys	08/05/2019 IPV (polio) 7yrs 2mos		
<b>MMR</b>	05/13/2013 MMR 1yr	08/05/2019 MMRV (ProQuad) 7yrs 2mos				
<b>Hepatitis B</b>	05/10/2012 Hep B (ped/adol) 1dy	07/10/2012 DTaP-Hep B- IPV (Pediarix) 2mos 1dy	11/12/2012 DTaP-Hep B- IPV (Pediarix) 6mos 3dys			
<b>Varicella</b>	05/13/2013 Varicella (Varivax) 1yr	08/05/2019 MMRV (ProQuad) 7yrs 2mos				
<b>HPV</b>	09/26/2023 HPV9 11yrs 4mos					
<b>Hepatitis A</b>	05/13/2013 Hep A (ped/adol) 1yr	12/09/2013 Hep A (ped/adol) 1yr 7mos				
<b>Seasonal Influenza</b>	11/12/2012 Influenza (Historical) 6mos 3dys	12/17/2012 Influenza (Historical) 7mos 8dys	09/13/2013 Influenza (Historical) 1yr 4mos	10/10/2014 Influenza (Historical) 2yrs 5mos	10/13/2015 Influenza (Historical) 3yrs 5mos	09/26/2023 Influenza IIV4 (P-Free Inj) 11yrs 4mos
<b>Meningococcal Conjugate</b>	09/26/2023 MCV4 (Menactra or Menveo) 11yrs 4mos					
<b>SARS-CoV-2</b>	09/26/2023 COVID-19 PFR-BNT (23- 24) 10mcg 11yrs 4mos					





# Know Your Adult Resources and Where to Find Them

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# 2023 Recommended Immunization Schedule For Adults

**Addendum** Recommended Adult Immunization Schedule, United States, 2023

In addition to the recommendations presented in the previous sections of this Immunization Schedule, ACIP has approved the following recommendations by majority vote since October 20, 2022. The following recommendations have been adopted by the CDC Director and are now official. Links are provided if these recommendations have been published in the Morbidity and Mortality Weekly Report (MMWR).

**Table 2** Recommended Adult Immunization Schedule by Medical Condition or Other Indication, United States, 2023

Vaccine	Pregnancy	Immuno-compromised (excluding HIV infection)	HIV infection CD4 percentage and count	Asplenia, complement deficiencies	End-stage renal disease, or on hemodialysis	Heart or lung disease, alcoholism*	Chronic liver disease	Diabetes	Health care personnel†	Men who have sex with men
COVID-19			<15% or <200							
COVID-19 (Moderna, Pfizer-BioNTech)			>15% and ≥200							
Respiratory syncytial virus (RSV)										
Poliovirus (IPV)										
Influenza (IIV4, ccIV4, RIV4, LAIV4)										

**Table 1** Recommended Adult Immunization Schedule for ages 19 years or older, United States, 2023

Vaccine	19–26 years	27–49 years	50–64 years	≥65 years
COVID-19	2- or 3- dose primary series and booster (See Notes)			
Influenza inactivated (IIV4) or Influenza recombinant (RIV4)	1 dose annually			
Influenza live, attenuated (LAIV4)	1 dose annually			
Tetanus, diphtheria, pertussis (Tdap or Td)	1 dose Tdap each pregnancy; 1 dose Td/Tdap for wound management (see notes)			
Measles, mumps, rubella (MMR)	1 dose Tdap, then Td or Tdap booster every 10 years			
Measles, mumps, rubella (MMR)	1 or 2 doses depending on indication (if born in 1957 or later)			
Varicella (VAR)	2 doses (if born in 1980 or later)			
Zoster recombinant (RZV)	2 doses for immunocompromising conditions (see notes)			
Human papillomavirus (HPV)	2 doses			
Pneumococcal (PCV15, PCV20, PPSV23)	2 or 3 doses depending on age at initial vaccination or condition			
Hepatitis A (HepA)	27 through 45 years			
Hepatitis B (HepB)	1 dose PCV15 followed by PPSV23 OR 1 dose PCV20 (see notes)			
Meningococcal A, C, W, Y (MenACWY)	See Notes			
Meningococcal B (MenB)	See Notes			
Haemophilus influenzae type b (Hib)	2, 3, or 4 doses depending on vaccine			
	2, 3, or 4 doses depending on vaccine or condition			
	1 or 2 doses depending on indication, see notes for booster recommendations			
	2 or 3 doses depending on vaccine and indication, see notes for booster recommendations			
	19 through 23 years			
	1 or 3 doses depending on indication			

  Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection.  
  Recommended vaccination for adults with an additional risk factor or another indication.  
  Recommended vaccination based on shared clinical decision-making.  
  No recommendation/Not applicable.

- Adult vaccination is based primarily on risk conditions
- Schedule notes include information on risk groups, minimum and recommended intervals
- Addendum includes new or updated ACIP vaccine recommendations

[2023 \(CDC\) Adult Immunization Schedule](#)

**Table 1** Recommended Adult Immunization Schedule by Age Group, United States, 2023

Vaccine	19–26 years	27–49 years	50–64 years	≥65 years
COVID-19	2- or 3- dose primary series and booster (See Notes)			
Influenza inactivated (IIV4) or Influenza recombinant (RIV4) <sup>or</sup> Influenza live, attenuated (LAIV4)	1 dose annually			
Tetanus, diphtheria, pertussis (Tdap or Td)				1 dose every 10 years (see notes)
Measles, mumps, rubella (MMR)				2 doses (see notes)
Varicella (VAR)				2 doses (see notes)
Zoster recombinant (RZV)		2 doses		2 doses
Human papillomavirus (HPV)		2 or 3 doses initial vaccination		
Pneumococcal (PCV15, PCV20, PPSV23)				1 dose (see notes)
Hepatitis A (HepA)				1 dose (see notes)
Hepatitis B (HepB)		2, 3, or 4 doses depending on vaccine or condition		1 dose (see notes)
Meningococcal A, C, W, Y (MenACWY)		1 or 2 doses depending on indication, see notes for booster recommendations		
Meningococcal B (MenB)		2 or 3 doses depending on vaccine and indication, see notes for booster recommendations		
Haemophilus influenzae type b (Hib)		1 or 3 doses depending on indication		

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

= Recommended vaccination for adults with an additional risk factor or another indication

= Recommended vaccination based on shared clinical decision-making

= No recommendation/Not applicable

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

Recommended vaccination for adults with an additional risk factor or another indication

Recommended vaccination based on shared clinical decision-making

No recommendation/Not applicable



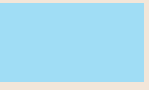


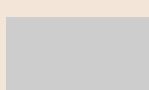
Recommended Adult Immunization Schedule, United States, 2023 ([cdc.gov](https://www.cdc.gov))

**Table 2**

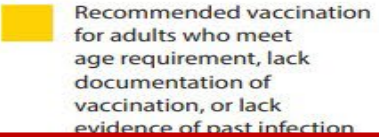
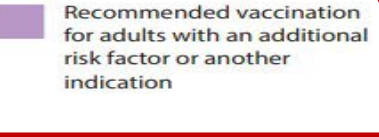
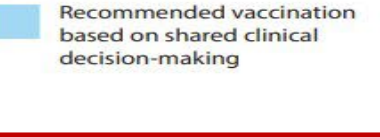
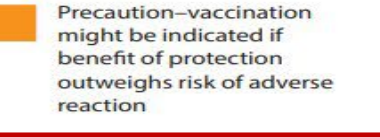
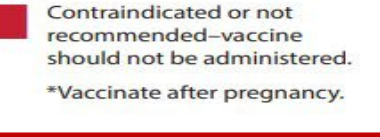

Recommended Adult Immunization Schedule by Medical Condition or Other Indication, United States, 2023

Vaccine	Pregnancy	Chronic liver disease	Diabetes	Health care personnel <sup>b</sup>	Men who have sex with men
COVID-19					
IIV4 or RIV4 or LAIV4				1 dose annually	
Tdap or Td	1 dose Tdap during pregnancy				
MMR	Contraindicated				
VAR	Contraindicated				
RZV					
HPV	Not recommended				
Pneumococcal (PCV15, PCV20, PPSV23)				PPSV23 OR 1 dose PCV20 (see notes)	
HepA					
HepB	3 doses (see notes)				
MenACWY					
MenB	Precaution				
Hib					

 = Recommended vaccination for adult who meet age requirement, lack documentation of vaccination, or lack evidence of past infection	 = Recommended vaccination for adults with an additional risk factor or another indication	 = Recommended vaccination based on shared clinical decision-making	 = Precaution-vaccination might be indicated if benefit of protection outweighs risk of adverse reaction	 = Contraindicated or not recommended-vaccine should not be administered	 = No recommendation/not applicable
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 Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection	 Recommended vaccination for adults with an additional risk factor or another indication	 Recommended vaccination based on shared clinical decision-making	 Precaution-vaccination might be indicated if benefit of protection outweighs risk of adverse reaction	 Contraindicated or not recommended-vaccine should not be administered. *Vaccinate after pregnancy.	 No recommendation/ Not applicable
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## Notes

### Recommended Adult Immunization Schedule, United States, 2023

- **Age 60 years or older with** known risk factors for hepatitis B virus infection **should** complete a HepB vaccine series.
- **Age 60 years or older without** known risk factors for hepatitis B virus infection **may** complete a HepB vaccine series.

#### - Risk factors for hepatitis B virus infection include:

- **Chronic liver disease** (e.g., persons with hepatitis C, cirrhosis, fatty liver disease, alcoholic liver disease, autoimmune hepatitis, alanine aminotransferase [ALT] or aspartate aminotransferase [AST] level greater than twice upper limit of normal)
- **HIV infection**
- **Sexual exposure risk** (e.g., sex partners of hepatitis B surface antigen [HBsAg]-positive persons; sexually active persons not in mutually monogamous relationships; persons seeking evaluation or treatment for a sexually transmitted infection; men who have sex with men)
- **Current or recent injection drug use**
- **Percutaneous or mucosal risk for exposure to blood** (e.g., household contacts of HBsAg-positive persons; residents and staff of facilities for developmentally disabled persons; health care and public safety personnel with reasonably anticipated risk for exposure to blood or blood-contaminated body fluids; persons on maintenance dialysis, including in-center or home hemodialysis and peritoneal dialysis, and persons who are predialysis; patients with diabetes)
- **Incarceration**
- **Travel in countries with high or intermediate endemic hepatitis B**

#### Special situations

- **Patients on dialysis:** complete a 3- or 4-dose series
  - 3-dose series Recombivax HB at 0, 1, 6 months (note: use Dialysis Formulation 1 mL = 40 mcg)
  - 4-dose series Engerix-B at 0, 1, 2, and 6 months (note: use 2 mL dose instead of the normal adult dose of 1 mL)

## Human papilloma

### Routine vaccination

- **HPV vaccination recommended through age 26 years:** 2-dose series on age at initial vaccination

- **Age 15 years or older at initial vaccination:** 3-dose series at 0, 1–2 months, and 6 months; intervals: dose 1 to dose 2: 12 weeks / dose 1 to dose 3: 12 weeks (if dose 1 administered too soon)

- **Age 9–14 years at initial vaccination:** 1 dose or 2 doses less than 12 months apart; 1 additional dose

- **Age 9–14 years at initial vaccination:** 2 doses at least 5 months apart; series complete, no additional doses

- **Interrupted schedules:** If vaccination interrupted, the series does not need to be restarted

- **No additional dose recommended if a second vaccine series has been completed:** recommended dosing interval

### Shared clinical decision-making

- **Some adults age 27–45 years:** shared clinical decision-making, 2-dose series

### Special situations

- **Age ranges recommended for catch-up vaccination or shared clinical decision-making also apply in special situations:**
  - **Immunocompromising conditions:** 3-dose series, even if previously vaccinated; vaccination at age 9 through 26 years
  - **Pregnancy:** Pregnancy test before vaccination; HPV vaccination until after pregnancy; no additional doses if inadvertently vaccinated while pregnant

## Notes

### Recommended Adult Immunization Schedule for ages 19 years or older, United States, 2023

See Addendum for new or updated ACIP vaccine recommendations

For vaccine recommendations for persons 18 years of age or younger, see the Recommended Child and Adolescent Immunization Schedule.

### COVID-19 vaccination

#### Routine vaccination

- **Primary series:** 2-dose series at 0, 4–8 weeks (Moderna) or 2-dose series at 0, 3–8 weeks (Novavax, Pfizer-BioNTech)
- **Booster dose:** see [www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html](https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html)

#### Special situations

Persons who are moderately or severely immunocompromised

- **Primary series**
  - 3-dose series at 0, 4, 8 weeks (Moderna) or 3-dose series at 0, 3, 7 weeks (Pfizer-BioNTech)
  - 2-dose series at 0, 3 weeks (Novavax)
- **Booster dose:** see [www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html](https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html)
- **Pre-exposure prophylaxis (e.g., monoclonal antibodies)** may be considered to complement COVID-19 vaccination. See [www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html#immunocompromised](https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html#immunocompromised)

For Janssen COVID-19 Vaccine recipients see COVID-19 schedule at [www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html](https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html).

**Note:** Current COVID-19 schedule available at [www.cdc.gov/vaccines/covid-19/downloads/COVID-19-immunization-schedule-ages-6months-older.pdf](https://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, please visit [www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/covid-19-vaccines](https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/covid-19-vaccines)

### Haemophilus influenzae type b vaccination

#### Special situations

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

### Hepatitis A vaccination

#### Routine vaccination

- **Not at risk but want protection from hepatitis A** (identification of risk factor not required):
  - 2-dose series HepA (Havrix 6–12 months apart or Vaqta 6–18 months apart [minimum interval: 6 months]) or 3-dose series HepA-HepB (Twinrix at 0, 1, 6 months [minimum intervals: dose 1 to dose 2: 4 weeks / dose 2 to dose 3: 5 months])

#### Special situations

- **At risk for hepatitis A virus infection:** 2-dose series HepA or 3-dose series HepA-HepB as above
  - **Chronic liver disease** (e.g., persons with hepatitis B, hepatitis C, 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**
  - **Men who have sex with men**
  - **Injection or noninjection drug use**
  - **Persons experiencing homelessness**
  - **Work with hepatitis A virus** in research laboratory or with nonhuman primates with hepatitis A virus infection

- **Travel in countries with high or intermediate endemic hepatitis A** (HepA-HepB [Twinrix] may be administered on an accelerated schedule of 3 doses at 0, 7, and 21–30 days, followed by a booster dose at 12 months)

- **Close, personal contact with international adoptee** (e.g., household or regular babysitting) in first 60 days after arrival from country with high or intermediate endemic hepatitis A (administer dose 1 as soon as adoption is planned, at least 2 weeks before adoptee's arrival)

- **Pregnancy** if at risk for infection or severe outcome from infection during pregnancy

- **Settings for exposure**, including health care settings targeting services to injection or noninjection drug users or group homes and nonresidential day care facilities for developmentally disabled persons (individual risk factor screening not required)

### Hepatitis B vaccination

#### Routine vaccination

- **Age 19 through 59 years: complete a 2- or 3- or 4-dose series**
    - 2-dose series only applies when 2 doses of Heplisav-B\* are used at least 4 weeks apart
    - 3-dose series Engerix-B, PreHevbrio\*, or Recombivax HB at 0, 1, 6 months [minimum intervals: dose 1 to dose 2: 4 weeks / dose 2 to dose 3: 8 weeks / dose 1 to dose 3: 16 weeks]
    - 3-dose series HepA-HepB (Twinrix at 0, 1, 6 months [minimum intervals: dose 1 to dose 2: 4 weeks / dose 2 to dose 3: 5 months])
    - 4-dose series HepA-HepB (Twinrix) accelerated schedule of 3 doses at 0, 7, and 21–30 days, followed by a booster dose at 12 months
- \***Note:** Heplisav-B and PreHevbrio are not recommended in pregnancy due to lack of safety data in pregnant persons.

# Adult Immunization Schedule by Age

Recommendations for Ages 19 Years or Older, United States, 2023

[Print](#)

! See Addendum for new or updated recommendations

[View addendum](#)

## Using the schedule

To make vaccination recommendations:

1. Determine needed vaccines based on patient's age and health status
2. Assess for medical conditions and contraindications
3. Review special situations ([Vaccination for special situations](#))
4. Review contraindications and precautions
5. See [Addendum](#) for new or updated recommendations

## Addendum – Adult Recommended Immunization Schedule for ages 19 years or older, United States, 2023

Vaccines

Recommendations

Effective Date of Recommendation\*

Respiratory syncytial virus (RSV)

COVID-19 (Moderna, Pfizer-BioNTech)

### Addendum

### Recommended Adult Immunization Schedule, United States, 2023

In addition to the recommendations presented in the previous sections of this Immunization Schedule, ACIP has approved the following recommendations by majority vote since October 20, 2022. The following recommendations have been adopted by the CDC Director and are now official. Links are provided if these recommendations have been published in *Morbidity and Mortality Weekly Report (MMWR)*.

Vaccines	Recommendations	Effective Date of Recommendation*
COVID-19 (Moderna, Pfizer-BioNTech)	<ul style="list-style-type: none"><li>• All persons <math>\geq 6</math> months of age should receive 2023–2024 (monovalent, XBB containing) COVID-19 vaccines as authorized under EUA or approved by BLA.</li><li>• For detailed information, see: <a href="http://www.cdc.gov/covidschedule">www.cdc.gov/covidschedule</a></li></ul>	September 12, 2023
Respiratory syncytial virus (RSV)	<ul style="list-style-type: none"><li>• Adults 60 years of age and older may receive a single dose of Respiratory Syncytial Virus (RSV) vaccine, using shared clinical decision-making.</li><li>• For detailed information, see: <a href="http://www.cdc.gov/mmwr/volumes/72/wr/mm7229a4.htm?s_cid=mm7229a4_w">www.cdc.gov/mmwr/volumes/72/wr/mm7229a4.htm?s_cid=mm7229a4_w</a></li></ul>	June 27, 2023
Poliovirus (IPV)	<ul style="list-style-type: none"><li>• Adults who are known or suspected to be unvaccinated or incompletely vaccinated against polio should complete a primary vaccination series with inactivated polio vaccine (IPV).</li><li>• Adults who have received a primary series of trivalent oral polio vaccine (tOPV) or IPV in any combination and who are at increased risk of poliovirus exposure may receive another dose of IPV. Available data do not indicate the need for more than a single lifetime booster dose with IPV for adults.</li></ul>	June 27, 2023
Influenza (IIV4, cdV4, RIV4, LAIV4)	<ul style="list-style-type: none"><li>• All persons ages <math>\geq 6</math> months with egg allergy should receive influenza vaccine. Any influenza vaccine (egg based or non-egg based) that is otherwise appropriate for the recipient's age and health status can be used.</li><li>• Affirm the updated <i>MMWR</i> Recommendations and Reports, "Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices—United States, 2023–24 Influenza Season" <a href="http://www.cdc.gov/mmwr/volumes/72/rr/rr7202a1.htm">www.cdc.gov/mmwr/volumes/72/rr/rr7202a1.htm</a></li></ul>	June 27, 2023

\*The effective date is the date when the CDC director adopted the recommendation and when the ACIP recommendation became official

# General Best Practice Guidelines for Immunization

Updated August 1, 2023

Best Practices Guidance  
Kroger A, Bahta L, Long S, Sanchez P

## Introduction

Purpose and topics covered in this report...

## History

History of development of: Timing and Spacing, Contraindications and Precautions, Preventing and Managing Adverse Reactions...

## Timing and Spacing of Immunobiologics

Vaccine scheduling, supply and lapsed schedule, spacing of doses, simultaneous and nonsimultaneous administration, licensed combination vaccines, interchangeability of formulations, extra doses, conjugate vaccines...

## Contraindications and Precautions

General principles, standards of valid contraindications and precautions, and conditions incorrectly perceived as contraindications...

## Preventing and Managing Adverse Reactions

Benefit and risk communication, reporting adverse reactions, National Vaccine Injury Compensation Program...

## Vaccine Administration

Infection control and sterile technique, route of administration, multiple and jet injections. alleviating discomfort and pain, clinical implications of nonstandard practices...

# Altered Immunocompetence

General Best Practice Guidelines for Immunization

[Print](#)

Updated August 1, 2023

[Printer friendly version](#)  [26 pages]

## Updates

This section incorporates general content from the Infectious Diseases Society of America policy statement, 2013 IDSA Clinical Practice Guideline for Vaccination of the Immunocompromised Host ([1](#)), to which CDC provided input in November 2011. The evidence supporting this guidance is based on expert opinion and arrived at by consensus.

# COVID-19 Vaccine Clinical Considerations

## Interim Clinical Considerations for Use of COVID-19 Vaccines in the United States

Ages 12 years and older

[Print](#)

### Summary of recent changes (last updated October 24, 2023):

- Age transitions: Updated guidance for children who transition during the initial COVID-19 vaccination from 4 years to age 5 years and children who are moderately or severely immunocompromised from 5 years to age 12 years to receive the age-appropriate dosage based on their age on the day of vaccination.
- Interchangeability of COVID-19 vaccines: Clarification of circumstances in which administering doses from different manufacturers may be considered when doses from the same manufacturer are recommended.

### Reference Materials

- [COVID-19 Vaccination Recommendations Infographic \(Updated 10/13/2023\)](#)
- [COVID-19 Vaccination Recommendations Infographic \(Immunocompromised\) \(Updated 10/13/2023\)](#)

COVID-19 vaccination history prior to updated (2023–2024 Formula) mRNA vaccine*	Updated (2023–2024 Formula) mRNA vaccine	Number of updated (2023–2024 Formula) mRNA doses indicated	Dosage (mL/ug)	Vaccine vial cap and label colors <sup>§</sup>	Interval between doses
Unvaccinated	Moderna	1	0.5 mL/50 ug	Dark blue cap; blue label	—
	Pfizer-BioNTech	1	0.3 mL/30 ug	Gray cap; gray label	—
1 or more doses any mRNA	Moderna OR	1	0.5 mL/50 ug	Dark blue cap; blue label	At least 8 weeks after last dose
	Pfizer-BioNTech	1	0.3 mL/30 ug	Gray cap; gray label	At least 8 weeks after last dose
1 or more doses Novavax or Janssen, including in combination with any mRNA vaccine dose(s)	Moderna OR	1	0.5 mL/50 ug	Dark blue cap; blue label	At least 8 weeks after last dose
	Pfizer-BioNTech	1	0.3 mL/30 ug	Gray cap; gray label	At least 8 weeks after last dose



# Adult Case Study





## Case Study #3: Buzz

DOB: 2-4-56

Age: 67 years:

- Buzz is a 67-year-old patient with diabetes
- Has a history of chickenpox disease
- Has a winter home in Mexico
- Does not work in healthcare
- He has insurance that covers his immunizations

# BUZZ'S MCIR RECORD:

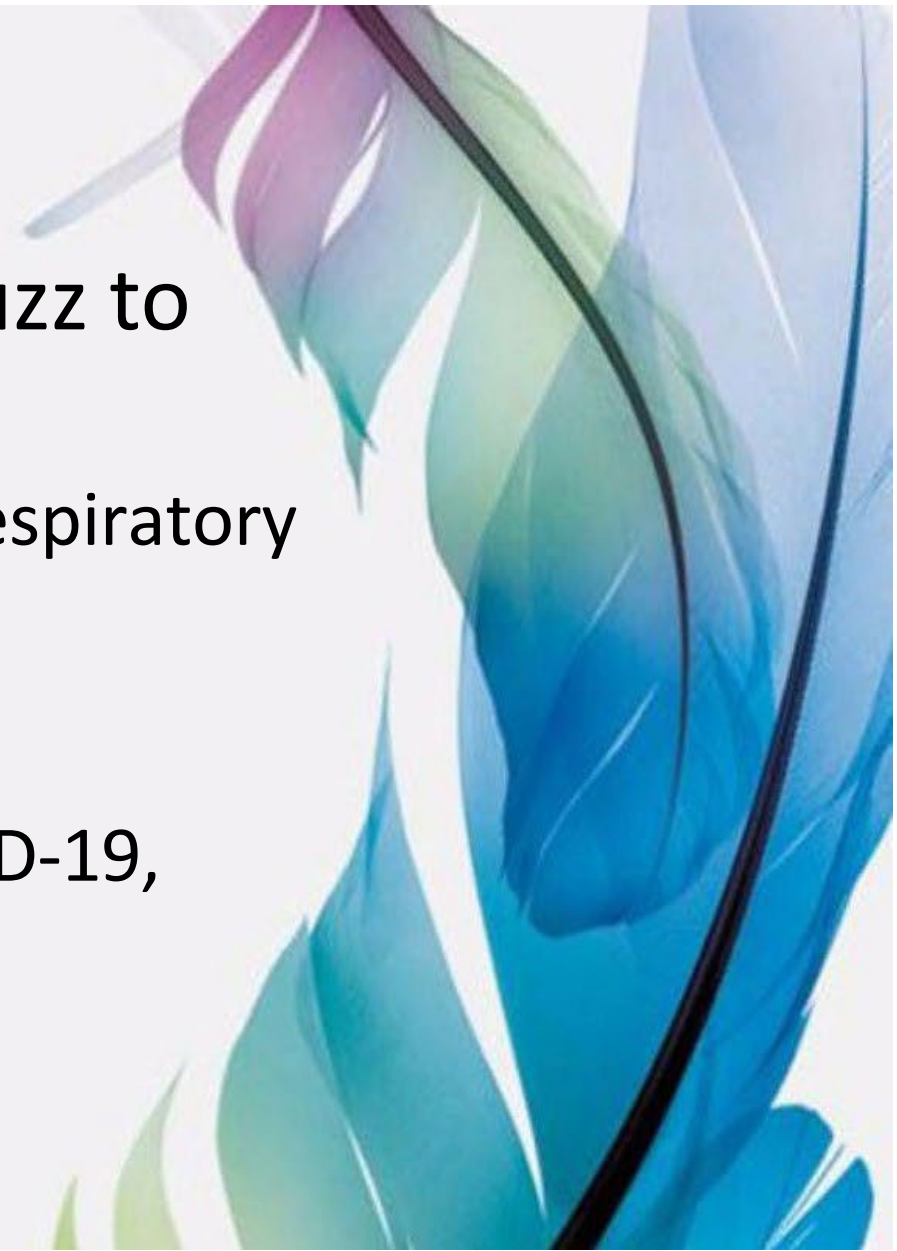
Series	Dose 1	Dose 2	Dose 3	Dose 4	Dose 5	Dose 6+	
<b>DTP/DTaP/ DT/Td/Tdap</b>	06/10/1980 Td PF (adol/adult) 24yrs 4mos	08/11/1980 Td PF (adol/adult) 24yrs 6mos					
<b>MMR</b>	08/20/1961 MMR 5yrs 6mos						
<b>Hepatitis B</b>							
<b>Hepatitis A</b>							
<b>Seasonal Influenza</b>	08/10/2018 Influenza (Historical) 62yrs 6mos	10/07/2019 Influenza (Historical) 63yrs 8mos	10/15/2020 Influenza (Historical) 64yrs 8mos	11/01/2021 Influenza (Historical) 65yrs 8mos	10/21/2022 Influenza IIV4 High Dose (FluZone HD Quad) 66yrs 8mos		
<b>Pneumococcal Adult</b>	08/10/2018 PPSV23 (Pneumovax) 62yrs 6mos						
<b>SARS-CoV-2</b>	09/19/2022 COVID-19 PFR Bivalent 30mcg/0.3mL 66yrs 7mos						
<b>Zoster</b>	08/09/2019 Zoster ZVL (Zostavax) 63yrs 6mos						
<b>RSV</b>							
<b>Other Administrations</b>							
<b>Series</b>							
<b>Varicella</b>	08/09/2019 Zoster ZVL (Zostavax) 63yrs 6mos						
<b>Dispensed Vaccines / Biologics</b>							
<b>Vaccine/Biologic</b>						<b>Date</b>	<b>Age</b>
<i>No Dispensed Vaccines or Biologics Found</i>							
<b>Non-Administered Doses/Positive Immunity</b>							
<b>Series/Antigen</b>	<b>Date</b>	<b>Reason</b>	<b>Entered by</b>				
Varicella	04/02/1962	Immunity	MDHHS Nurse Educators				

# Case Study #3: Buzz

## Question #1:

Which vaccines are recommended for Buzz to receive today?

- A. Td, Hep A, Flu, COVID-19, Shingrix (Zoster), Respiratory Syncytial Virus (RSV)
- B. Td, Hep A, Hep B, Flu, COVID-19
- C. Tdap, Hep B, Hep A, Flu, Pneumococcal, COVID-19, Shingrix (Zoster), RSV
- D. Tdap, Hep B, COVID-19, Flu, RSV
- E. None of the above



# Question #1: Answer: C

- Tdap
- Hep B
- Hep A
- Flu
- Pneumococcal
- COVID-19
- Shingrix (Zoster)
- RSV



# Discussion of answer

- Tdap needed
- 2<sup>nd</sup> MMR not recommended
- Hep B: Age 60 years or older with known risk factors for hepatitis B virus infection should complete a Hep B vaccine series
- Hep A: Winter home in Mexico, is recommended to have protection
- Flu\*: is yearly and CDC prefers for those 65 years and older to get:
  - HD-IIIV4 **OR**
  - aIIIV4 **OR**
  - RIV4

\*If none of these are available, give any flu vaccine that is age and dose appropriate

- Pneumococcal:
  - One dose of PCV20 at least 1 year after the last PPSV23 dose, **OR**
  - One dose of PCV15 at least 1 year after the last PPSV23
- RSV: is a shared clinical decision-making discussion
- COVID-19: Only needs one dose of COVID-19 2023-24 formula
- Shingrix (Zoster): whole series needs to be administered even though he had a Zostavax

[adult-combined-schedule.pdf \(cdc.gov\)](#)

# Notes

## Recommended Adult Immunization Schedule, United States, 2023

### Hepatitis A vaccination

#### Routine vaccination

- **Not at risk but want protection from hepatitis A** (identification of risk factor not required):  
2-dose series HepA (Havrix 6–12 months apart or Vaqta 6–18 months apart [minimum interval: 6 months]) or 3-dose series HepA-HepB (Twinrix at 0, 1, 6 months [minimum intervals: dose 1 to dose 2: 4 weeks / dose 2 to dose 3: 5 months])

- **Travel in countries with high or intermediate endemic hepatitis A** (HepA-HepB [Twinrix] may be administered on an accelerated schedule of 3 doses at 0, 7, and 21–30 days, followed by a booster dose at 12 months)

### Hepatitis B vaccination

- **Age 60 years or older with** known risk factors for hepatitis B virus infection **should** complete a HepB vaccine series.
- **Age 60 years or older without** known risk factors for hepatitis B virus infection **may** complete a HepB vaccine series.

### Measles, mumps, and rubella vaccination

#### Routine vaccination

- **No evidence of immunity to measles, mumps, or rubella:** 1 dose
- **Evidence of immunity:** Born before 1957 (health care personnel, see below), documentation of receipt of MMR vaccine, laboratory evidence of immunity or disease (diagnosis of disease without laboratory confirmation is not evidence of immunity)

[adult-combined-schedule.pdf \(cdc.gov\)](#)

**Table 1**

COVID-19 vaccination recommendations have changed. Find the latest recommendations at [www.cdc.gov/covidschedule](http://www.cdc.gov/covidschedule)  
 Recommended Adult Immunization Schedule for ages 19 years or older, United States, 2023

Vaccine	19–26 years	27–49 years	50–64 years	≥65 years
COVID-19	2- or 3- dose primary series and booster (See Notes)			★
Influenza inactivated (IIV4) or Influenza recombinant (RIV4)	1 dose annually			★
Influenza live, attenuated (LAIV4)	1 dose annually			
Tetanus, diphtheria, pertussis (Tdap or Td)	1 dose Tdap each pregnancy; 1 dose Td/Tdap for wound management (see notes)			
	1 dose Tdap, then Td or Tdap booster every 10 years			★
Measles, mumps, rubella (MMR)	1 or 2 doses depending on indication (if born in 1957 or later)			For healthcare personnel, see notes
Varicella (VAR)	2 doses (if born in 1980 or later)	2 doses		
Zoster recombinant (RZV)	2 doses for immunocompromising conditions (see notes)		2 doses	★
Human papillomavirus (HPV)	2 or 3 doses depending on age at initial vaccination or condition	27 through 45 years		
Pneumococcal (PCV15, PCV20, PPSV23)	1 dose PCV15 followed by PPSV23 OR 1 dose PCV20 (see notes)			See Notes
Hepatitis A (HepA)	2, 3, or 4 doses depending on vaccine			★
Hepatitis B (HepB)	2, 3, or 4 doses depending on vaccine or condition			★
Meningococcal A, C, W, Y (MenACWY)	1 or 2 doses depending on indication, see notes for booster recommendations			
Meningococcal B (MenB)	2 or 3 doses depending on vaccine and indication, see notes for booster recommendations			
	19 through 23 years			

  Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection
   Recommended vaccination for adults with an additional risk factor or another indication
   Recommended vaccination based on shared clinical decision-making
   No recommendation/Not applicable

[adult-combined-schedule.pdf \(cdc.gov\)](https://www.cdc.gov/vaccines/imz/downloads/pdf/adult-combined-schedule.pdf)

**Table 2** Recommended Adult Immunization Schedule by Medical Condition or Other Indication, United States, 2023

Vaccine	Pregnancy	Immuno-compromised (excluding HIV infection)	HIV infection CD4 percentage and count		Asplenia, complement deficiencies	End-stage renal disease, or on hemodialysis	Heart or lung disease; alcoholism*	Chronic liver disease	Diabetes	Health care personnel <sup>b</sup>	Men who have sex with men	
			<15% or <200 mm <sup>3</sup>	≥15% and ≥200 mm <sup>3</sup>								
COVID-19		See Notes							★			
IIV4 or RIV4 or LAIV4		1 dose annually							★	or 1 dose annually		
Tdap or Td	1 dose Tdap each pregnancy	1 dose Tdap, then Td or Tdap booster every 10 years							★			
MMR	Contraindicated*	Contraindicated	1 or 2 doses depending on indication									
VAR	Contraindicated*	Contraindicated		2 doses								
RZV		2 doses at age ≥19 years			2 doses at age ≥50 years				★			
HPV	Not Recommended*	3 doses through age 26 years			2 or 3 doses through age 26 years depending on age at initial vaccination or condition							
Pneumococcal (PCV15, PCV20, PPSV23)		1 dose PCV15 followed by PPSV23 OR 1 dose PCV20 (see notes)									★	
HepA				2, 3, or 4 doses depending on vaccine				★				
HepB	3 doses (see notes)	2, 3, or 4 doses depending on vaccine or condition									★	
MenACWY		1 or 2 doses depending on indication, see notes for booster recommendations										

Use the legend on the bottom of the page to determine whether the patient is eligible for a vaccine due to their medical condition

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

Recommended vaccination for adults with an additional risk factor or another indication

Recommended vaccination based on shared clinical decision-making

Precaution—vaccination might be indicated if benefit of protection outweighs risk of adverse reaction

Contraindicated or not recommended—vaccine should not be administered.

No recommendation/Not applicable

\*Vaccinate after pregnancy.



# Adults ≥65 years old

## Complete pneumococcal vaccine schedules

Prior vaccines	Option A
None*	PCV20
PPSV23 only at any age	≥1 year → PCV20
PCV13 only at any age	≥1 year → PCV20
PCV13 at any age & PPSV23 at <65 yrs	≥5 years → PCV20

### Notes Recommended Adult Immunization Schedule, United States, 2023

#### Pneumococcal vaccination

##### Routine vaccination

###### • Age 65 years or older who have:

• **Not previously received a dose of PCV13, PCV15, or PCV20 or whose previous vaccination history is unknown:** 1 dose PCV15 OR 1 dose PCV20. If PCV15 is used, this should be followed by a dose of PPSV23 given at least 1 year after the PCV15 dose. A minimum interval of 8 weeks between PCV15 and PPSV23 can be considered for adults with an immunocompromising condition,\* cochlear implant, or cerebrospinal fluid leak to minimize the risk of invasive pneumococcal disease caused by serotypes unique to PPSV23 in these vulnerable groups.

• **Previously received only PCV7:** follow the recommendation above.

• **Previously received only PCV13:** 1 dose PCV20 at least 1 year after the PCV13 dose OR complete the recommended PPSV23 series as described here [www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf](http://www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf).

• **Previously received only PPSV23:** 1 dose PCV15 OR 1 dose PCV20 at least 1 year after the PPSV23 dose. If PCV15 is used, it need not be followed by another dose of PPSV23.

• **Previously received both PCV13 and PPSV23 but NO PPSV23 was received at age 65 years or older:** 1 dose PCV20 at least 5 years after their last pneumococcal vaccine dose OR complete the recommended PPSV23 series as described here [www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf](http://www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf).

• **Previously received both PCV13 and PPSV23, AND PPSV23 was received at age 65 years or older:** Based on shared clinical decision-making, 1 dose of PCV20 at least 5 years after the last pneumococcal vaccine dose.

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

##### Special situations

###### • Age 19–64 years with certain underlying medical conditions or other risk factors\*\* who have

• **Not previously received a PCV13, PCV15, or PCV20 or whose previous vaccination history is unknown:** 1 dose PCV15 OR 1 dose PCV20. If PCV15 is used, this should be followed by a dose of PPSV23 given at least 1 year after the PCV15 dose. A minimum interval of 8 weeks between PCV15 and PPSV23 can be considered for adults with an immunocompromising condition,\* cochlear implant, or cerebrospinal fluid leak

• **Previously received only PCV7:** follow the recommendation above.

• **Previously received only PCV13:** 1 dose PCV20 at least 1 year after the PCV13 dose OR complete the recommended PPSV23 series as described here [www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf](http://www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf).

• **Previously received only PPSV23:** 1 dose PCV15 OR 1 dose PCV20 at least 1 year after the PPSV23 dose. If PCV15 is used, it need not be followed by another dose of PPSV23.

• **Previously received both PCV13 and PPSV23 but have not completed the recommended series:** 1 dose PCV20 at least 5 years after their last pneumococcal vaccine dose OR complete the recommended PPSV23 series as described here [www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf](http://www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf).

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

\***Note:** Immunocompromising conditions include chronic renal failure, immunodeficiency, acquired immunodeficiency syndrome, generalized malignancy, HIV, Hodgkin disease, myeloma, solid organ transplant, splenectomy, acquired asplenia, sickle cell disease, hemoglobinopathies.

\*\***Note:** Underlying medical risk factors include alcoholism, chronic lung disease, chronic liver disease, cochlear implant, congenital or acquired CSF leak, diabetes mellitus, HIV, Hodgkin disease, immunosuppression, myeloma, nephrotic syndrome, or sickle cell disease of any type.

#### Polio

##### Routine vaccination

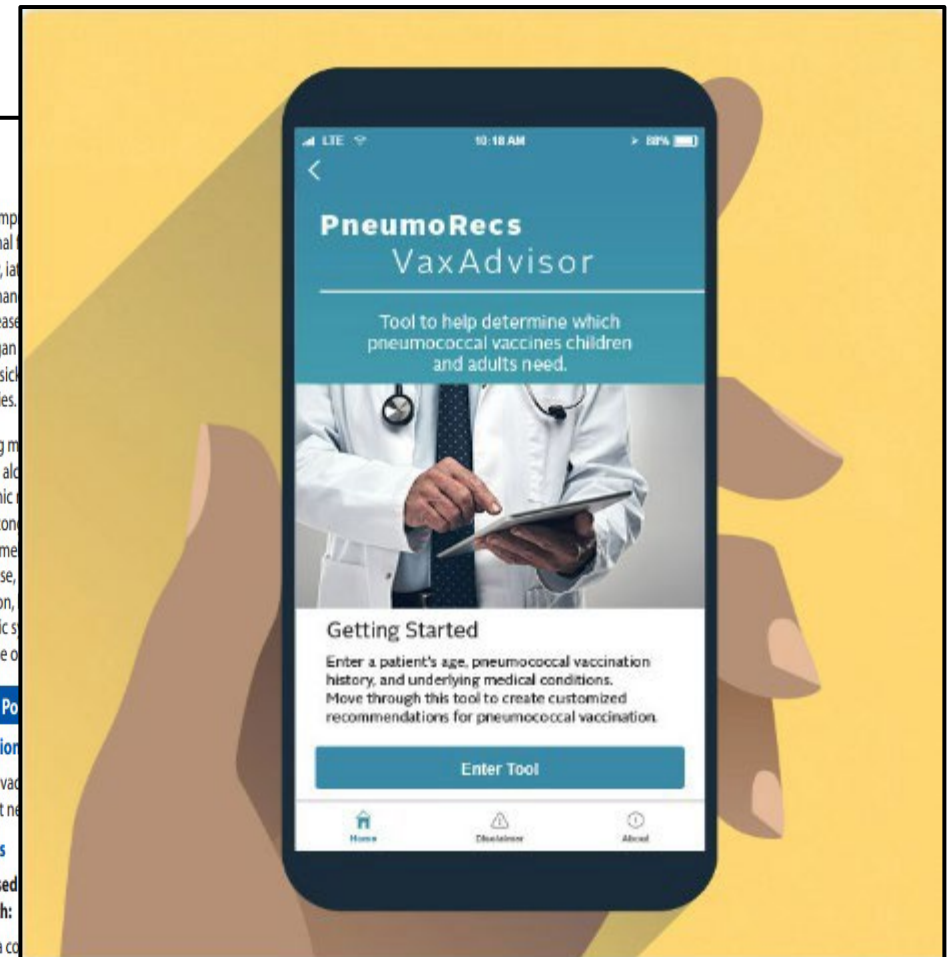
Routine poliovirus vaccination in the United States is not recommended for adults.

##### Special situations

###### • Adults at increased risk to poliovirus with:

- No evidence of a complete poliovirus vaccination series (i.e., at least 3 doses (1, 2, or 3 doses) to 1 year of age)
- Evidence of complete poliovirus vaccination series (i.e., at least 3 doses) but no IPV booster

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



PneumoRecs VaxAdvisor is available for download on iOS and Android mobile devices.

[Pneumococcal Vaccine Timing for Adults greater than or equal to 65 years \(cdc.gov\)](http://www.cdc.gov/vaccines/imz/adult/pneumococcal-vaccine-timing)

[PneumoRecs VaxAdvisor: Vaccine Provider App | CDC](https://www.cdc.gov/vaccines/imz/adult/pneumoapp.html)

[Adult Immunization Schedule – Healthcare Providers | CDC](https://www.cdc.gov/vaccines/imz/adult)

Ages 12 years and older\*

COVID-19 vaccination history prior to updated (2023–2024 Formula) vaccine <sup>†</sup>	Updated (2023–2024 Formula) mRNA vaccine	Number of updated (2023–2024 Formula) mRNA doses indicated <sup>†</sup>	Dosage (mL/ug)	Vaccine vial cap and label colors <sup>§</sup>	Interval between dose
Unvaccinated	Moderna	3	0.5 mL/50 ug	Dark blue cap; blue label	Dose 1 and Dose 2 weeks At least 4 weeks
	Pfizer-BioNTech	3	0.3 mL/30 ug	Gray cap; gray label	Dose 1 and Dose 2 weeks At least 4 weeks
1 dose any Moderna	Moderna	2	0.5	Dark blue	Dose 1: 4 week

## Updated (2023–2024 Formula) COVID-19 Vaccine

Interim 2023–2024 COVID-19 Immunization Schedule for Persons 6 Months of Age and Older

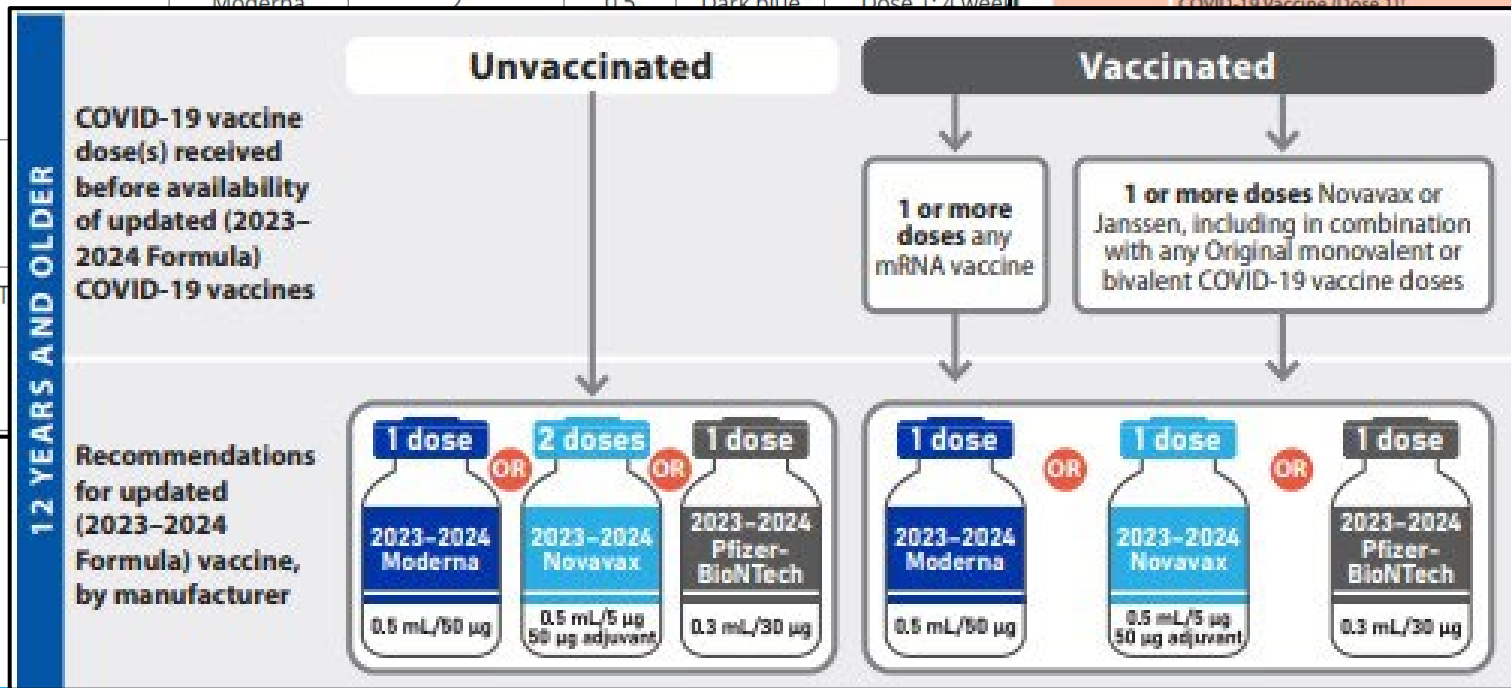


**Table 2b.** For people who **ARE** moderately or severely immunocompromised *Continued*

**2023–24 Pfizer-BioNTech COVID-19 Vaccine - CONTINUED**  
Vaccine type: mRNA - Do NOT use any previously available Pfizer-BioNTech COVID-19 vaccine products.

Age	COVID-19 Vaccination History <sup>*</sup> (regardless of COVID-19 vaccine formula)	2023–24 Vaccine Schedule	Administer
	Unvaccinated: 0 doses	Give a 3-dose initial series. Administer: • Dose 1 now • Dose 2 at least 3 weeks after Dose 1 • Dose 3 at least 4 weeks after Dose 2	0.3 mL/30 µg  From gray-capped vial with gray label or manufacturer-filled syringe with gray box on label  Intramuscular (IM) injection
	1 previous dose of any Pfizer-BioNTech COVID-19 Vaccine (Dose 1) <sup>†</sup>	Complete series. Administer: • Dose 2 at least 3 weeks after Dose 1 • Dose 3 at least 4 weeks after Dose 2	
1	1 or more doses Novavax or Janssen, including in combination with any Original monovalent or bivalent COVID-19 vaccine doses	Give 1 dose at least 8 weeks (2 months) after the last dose	

People who are moderately or severely immunocompromised have the **option to receive 1 additional dose at least 8 weeks (2 months) following** the last recommended dose. Further additional dose(s) may be administered, **informed by the clinical judgement** of a healthcare provider and personal preference and circumstances. Any further additional doses should be administered at **least 8 weeks (2 months) after the last COVID-19 vaccine dose.**



# Case Study #3: Buzz (question #1 cont.)

After having a shared clinical decision-making discussion with his provider, Buzz decided he would get the following vaccines:

- Tdap
- Hep B (Twinrix)
- Hep A (Twinrix)
- Flu

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- Pneumococcal
- RSV
- COVID-19
- Shingrix (Zoster)

# BUZZ'S MCIR RECORD:

Series	Immunizations						Other
	Dose 1	Dose 2	Dose 3	Dose 4	Dose 5	Dose 6+	
<b>DTP/DTaP/ DT/Td/Tdap</b>	06/10/1980 Td PF (adol/adult) 24yrs 4mos	08/11/1980 Td PF (adol/adult) 24yrs 6mos	11/02/2023 Tdap (adol/adult) 67yrs 8mos				
<b>MMR</b>	08/20/1961 MMR 5yrs 6mos						
<b>Hepatitis B</b>	11/02/2023 Hep A-Hep B (Twinrix) 67yrs 8mos						
<b>Hepatitis A</b>	11/02/2023 Hep A-Hep B (Twinrix) 67yrs 8mos						
<b>Seasonal Influenza</b>	08/10/2018 Influenza (Historical) 62yrs 6mos	10/07/2019 Influenza (Historical) 63yrs 8mos	10/15/2020 Influenza (Historical) 64yrs 8mos	11/01/2021 Influenza (Historical) 65yrs 8mos	10/21/2022 Influenza IIV4 High Dose (FluZone HD Quad) 66yrs 8mos	11/02/2023 Influenza IIV4 High Dose (FluZone HD Quad) 67yrs 8mos	
<b>Pneumococcal Adult</b>	08/10/2018 PPSV23 (Pneumovax) 62yrs 6mos	11/02/2023 PCV20 (Pevnar 20) 67yrs 8mos					
<b>SARS-CoV-2</b>	09/19/2022 COVID-19 PFR Bivalent 30mcg/0.3mL 66yrs 7mos	11/02/2023 COVID-19 PFR Comirnaty 2023/24 30mcg 67yrs 8mos					
<b>Zoster</b>	08/09/2019 Zoster ZVL (Zostavax) 63yrs 6mos	11/02/2023 Zoster RZV (Shingrix) 67yrs 8mos					
<b>RSV</b>	11/02/2023 RSV vaccine (Arexvy) 67yrs 8mos						
<b>Other Administrations</b>							
<b>Series</b>							
<b>Varicella</b>	08/09/2019 Zoster ZVL (Zostavax) 63yrs 6mos						

# Case Study #3: Buzz

## Question #2:


When does Buzz need to return for his **next** immunizations and which ones?

- A. 1 month for Hep B and Hep A (Twinrix)
- B. 2-3 months for MMR, RSV, COVID-19
- C. 3-6 months for MMR, Pneumococcal, RSV
- D. 12 months for Shingrix (Zoster)
- E. None of the above




## Answer: A. 1 month for HepA/HepB (Twinrix)

- Td/Tdap: booster every 10 years
- Flu: only one flu shot per season
- Pneumococcal: He is complete
- RSV: At this time RSV is only a one dose recommendation
- COVID-19: He only needs 1 dose this season
- Shingrix (Zoster): 2<sup>nd</sup> and last dose is due 2-6 months after the first dose



Thank you so much for  
being here today and  
for everything you do.

If you have any further questions,  
please contact us at:  
[checcimms@michigan.gov](mailto:checcimms@michigan.gov)



# Stay Up-To-Date on Immunization Recommendations

- Stay up-to-date by joining the MDHHS Listserv and receive email updates
- To sign up, email Dara Barrera at [djbarrera@msms.org](mailto:djbarrera@msms.org) and ask to be added to the MDHHS Immunization Listserv