

Hit Me With Your Best Shot: Updates to the 2021 Children and Adolescent Immunization Schedule

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Disclosure and Disclaimer

- In the past 12 months I have had the following financial relationships with manufacturer(s) of commercial product(s) and/or provider(s) of commercial service(s):
 - Member – Centers for Disease Control and Prevention Advisory Committee on Immunization Practices
 - Editor – *Current Opinion in Pediatrics*, Office Pediatrics series
 - Member – Takeda Data and Safety Monitoring Board
 - Principal Investigator – New York State Department of Health breastfeeding grant
- I do not intend to discuss any unapproved/investigative uses of a commercial product/device in my presentation.
- The views presented in this didactic do not necessarily represent the views and opinions of the American Academy of Pediatrics or the Centers for Disease Control and Prevention.

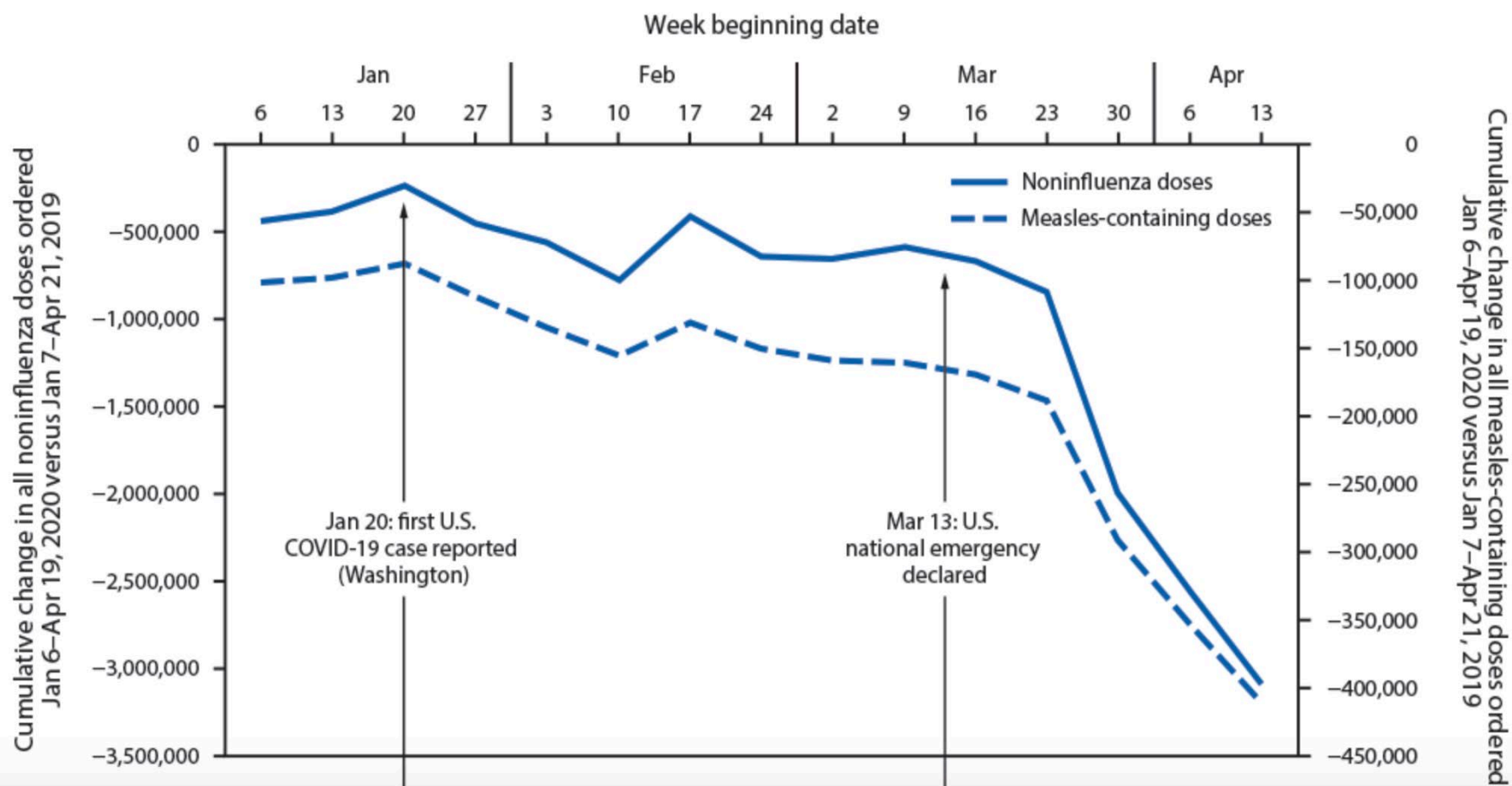
Objectives of Today's Presentation

- Review the Recommended Childhood and Adolescent Immunization Schedule for 2021.
- Share the rationale for the latest updates to the immunization schedules.
- Understand the process for approval of COVID-19 vaccine in children.

Immunization Schedules

- **Updated each year**
 - Represents current, approved Advisory Committee on Immunization Practices (ACIP) policy.
 - Designed for implementation of ACIP policy.
- **Approved by**
 - Centers for Disease Control and Prevention (CDC) Director
 - American Academy of Pediatrics
 - American Academy of Family Physicians
 - American College of Obstetricians and Gynecologists
 - American College of Nurse-Midwives
 - American Academy of Physician Assistants
 - National Association of Pediatric Nurse Practitioners
- **Published in February 2021**
 - *Morbidity and Mortality Weekly Report* (MMWR) Notice to Readers – announcement of availability of schedules on CDC immunization schedule website

FIGURE. Weekly changes in Vaccines for Children Program (VFC) provider orders* and Vaccine Safety Datalink (VSD) doses administered† for routine pediatric vaccines — United States, January 6–April 19, 2020



Updates in ACIP Recommendations for CDC Policy Statements Published after 2020 Schedule Approval

■ Influenza vaccination

- Grohskopf LA, et al. *MMWR*. 2020;69(No. RR-8):1–24
- 2020-21 influenza vaccination recommended for all persons 6 months and older who do not have contraindications

■ Meningococcal A,C,W,Y vaccination

- Mbaeyi SA, et al. *MMWR*. 2020;69(No. RR-9):1–41
- Summary of all recommendations from the CDC ACIP for use of meningococcal vaccines in the United States

Updates in ACIP Recommendations for CDC Policy Statements Published after 2020 Schedule Approval

■ COVID-19 vaccination

- Pfizer-BioNTech COVID-19 vaccine
 - Oliver SE, et al. *MMWR*. 2020;69(50):1922–1924
 - Interim recommendations for use of Pfizer-BioNTech COVID-19 vaccine, United States
- Moderna COVID-19 vaccine
 - Oliver SE, et al. *MMWR*. 2020;69(5152):1653–1656
 - Interim recommendations for use of Moderna COVID-19 vaccine, United States
- Janssen COVID-19 vaccine
 - Oliver SE, et al. *MMWR*. ePub: 2 March 2021
 - Interim recommendations for use of Janssen COVID-19 vaccine, United States



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

UNITED STATES
2021

Vaccines in the Child and Adolescent Immunization Schedule*

Vaccines	Abbreviations	Trade names
Diphtheria, tetanus, and acellular pertussis vaccine	DTaP	Daptacel® Infanrix®
Diphtheria, tetanus vaccine	DT	No trade name
<i>Haemophilus influenzae</i> type b vaccine	Hib (PRP-T) Hib (PRP-OMP)	ActHIB® Hiberix® PedvaxHIB®
Hepatitis A vaccine	Hep A	Havrix® Vaqta®
Hepatitis B vaccine	Hep B	Engerix-B® Recombivax HB®
Human papillomavirus vaccine	HPV	Gardasil 9®
Influenza vaccine (inactivated)	IIV	Multiple
Influenza vaccine (live, attenuated)	LAIV4	FluMist® Quadrivalent
Measles, mumps, and rubella vaccine	MMR	M-M-R II®
Meningococcal serogroups A, C, W, Y vaccine	MenACWY-D MenACWY-CRM MenACWY-TT	Menactra® Merveo® MenQuadfi®
Meningococcal serogroup B vaccine	MenB-4C MenB-FHbp	Bexsero® Trumenba®
Pneumococcal 13-valent conjugate vaccine	PCV13	Prevnar 13®
Pneumococcal 23-valent polysaccharide vaccine	PPSV23	Pneumovax 23®
Poliovirus vaccine (inactivated)	IPV	IPOL®
Rotavirus vaccine	RV1 RV5	Rotarix® RotaTeq®
Tetanus, diphtheria, and acellular pertussis vaccine	Tdap	Adacel® Boostrix®
Tetanus and diphtheria vaccine	Td	Tenivac® Tdvax™
Varicella vaccine	VAR	Varivax®
Combination vaccines (use combination vaccines instead of separate injections when appropriate)		
DTaP, hepatitis B, and inactivated poliovirus vaccine	DTaP-HepB-IPV	Pediarix®
DTaP, inactivated poliovirus, and <i>Haemophilus influenzae</i> type b vaccine	DTaP-IPV/Hib	Pentacel®
DTaP and inactivated poliovirus vaccine	DTaP-IPV	Kinrix® Quadracel®
DTaP, inactivated poliovirus, <i>Haemophilus influenzae</i> type b, and hepatitis B vaccine	DTaP-IPV-Hib-HepB	Vaxelis®
Measles, mumps, rubella, and varicella vaccine	MMRV	ProQuad®

*Administer recommended vaccines if immunization history is incomplete or unknown. Do not restart or add doses to vaccine series for extended intervals between doses. When a vaccine is not administered at the recommended age, administer at a subsequent visit. The use of trade names is for identification purposes only and does not imply endorsement by the ACP or CDC.

How to use the child/adolescent immunization schedule

- 1** Determine recommended vaccine by age (**Table 1**)
- 2** Determine recommended interval for catch-up vaccination (**Table 2**)
- 3** Assess need for additional recommended vaccines by medical condition and other indications (**Table 3**)
- 4** Review vaccine types, frequencies, intervals, and considerations for special situations (**Notes**)

Recommended by the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/acip/) and approved by the Centers for Disease Control and Prevention (www.cdc.gov/), American Academy of Pediatrics (www.aap.org/), American Academy of Family Physicians (www.aafp.org/), American College of Obstetricians and Gynecologists (www.acog.org/), American College of Pediatricians (www.acpeds.org/), American Association of Pediatricians (www.aapn.org/).

Instructions on how to use

Report

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



Download the CDC Vaccine Schedules App for providers at www.cdc.gov/vaccines/schedules/hcp/schedule-app.html.

Helpful information

- Complete ACIP recommendations: www.cdc.gov/vaccines/hcp/acip-recs/index.html
- General Best Practice Guidelines for Immunization: www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html
- Outbreak information (including case identification and outbreak response), see Manual for the Surveillance of Vaccine-Preventable Diseases: www.cdc.gov/vaccines/pubs/surv-manual
- ACIP Shared Clinical Decision-Making Recommendations www.cdc.gov/vaccines/acip/acip-scdm-faqs.html



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Human papillomavirus vaccine	HPV	Gardasil 9®
Influenza vaccine (inactivated)	IIV	Multiple
Influenza vaccine (live, attenuated)	LAIV4	FluMist® Quadrivalent
Measles, mumps, and rubella vaccine	MMR	M-M-R II®
Meningococcal serogroups A, C, W, Y vaccine	MenACWY-D MenACWY-CRM MenACWY-TT	Menactra® Merveo® MenQuadfi®
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Poliovirus vaccine (inactivated)	IPV	IPOL®
Rotavirus vaccine	RV1 RV5	Rotarix® RotaTeq®
Tetanus, diphtheria, and acellular pertussis vaccine	Tdap	Adacel® Boostrix®
Tetanus and diphtheria vaccine	Td	Tenivac® Tdapax™
Varicella vaccine		Varivax®
Combination vaccines (use combination vaccines instead of separate injections)		
DTaP, hepatitis B, and inactivated poliovirus vaccine		Diaperix®
DTaP, inactivated poliovirus, and <i>Haemophilus influenzae</i> type b vaccine		Daptacel®
DTaP and inactivated poliovirus vaccine		Infanrix®
DTaP, inactivated poliovirus, <i>Haemophilus influenzae</i> type b, and hepatitis B vaccine	DTaP-IPV-Hib-HepB	Vaxelis®
Measles, mumps, rubella, and varicella vaccine	MMRV	ProQuad®

Links to
additional
resources

How to use the child/adolescent immunization schedule

1

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2

Determine recommended interval for catch-up vaccination (**Table 2**)

3

Assess need for additional recommended vaccines by medical condition and other indications (**Table 3**)

4

Review vaccine types, frequencies, intervals, and considerations for special situations (**Notes**)

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Report

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- Outbreak information (including case identification and outbreak response), see Manual for the Surveillance of Vaccine-Preventable Diseases: www.cdc.gov/vaccines/pubs/surv-manual
- ACIP Shared Clinical Decision-Making Recommendations www.cdc.gov/vaccines/acip/acip-scdm-faqs.html



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List of vaccines, abbreviations, trade names

Report

- Suspected vaccine-preventable diseases or outbreaks to your state or local health department
- Clinically significant adverse events to the Vaccine Adverse Event Reporting System (VAERS) at www.vaers.hhs.gov or 800-822-7967



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- Outbreak information (including case identification and outbreak response), see Manual for the Surveillance of Vaccine-Preventable Diseases: www.cdc.gov/vaccines/pubs/surv-manual
- ACIP Shared Clinical Decision-Making Recommendations www.cdc.gov/vaccines/acip/acip-scdm-faqs.html



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Table 1

Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2021

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). School entry and adolescent vaccine age groups are shaded in gray.

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos	18 mos	19–23 mos	2–3 yrs	4–6 yrs	7–10 yrs	11–12 yrs	13–15 yrs	16 yrs	17–18 yrs
Hepatitis B (HepB)	1 st dose	← 2 nd dose →															
Rotavirus (RV): RV1 (2-dose series), RV5 (3-dose series)			1 st dose	2 nd dose	See Notes												
Diphtheria, tetanus, acellular pertussis (DTaP <7 yrs)			1 st dose	2 nd dose	3 rd dose			← 4 th dose →				5 th dose					
<i>Haemophilus influenzae</i> type b (Hib)			1 st dose	2 nd dose	See Notes		← 3 rd or 4 th dose, See Notes →										
Pneumococcal conjugate (PCV13)			1 st dose	2 nd dose	3 rd dose		← 4 th dose →										
Inactivated poliovirus (IPV <18 yrs)			1 st dose	2 nd dose			← 3 rd dose →					4 th dose					
Influenza (IIV)																	
or																	
Influenza (LAIV4)																	
Measles, mumps, rubella (MMR)					See Notes		← 1 st dose →					2 nd dose					
Varicella (VAR)							← 1 st dose →					2 nd dose					
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 ≥2years)																	
Meningococcal B																	
Pneumococcal polysaccharide (PPSV23)																	

Range of recommended ages for all children

Range of recommended ages for catch-up immunization

Range of recommended ages for certain high-risk groups

Recommended based on shared clinical decision-making or
*can be used in this age group

No recommendation/ not applicable

Table 2

Recommended Catch-up Immunization Schedule for Children and Adolescents Who Start Late or Who Are More than 1 month Behind, United States, 2021

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.**

Children age 4 months through 6 years					
Vaccine	Minimum Age for Dose 1	Minimum Interval Between Doses			
		Dose 1 to Dose 2	Dose 2 to Dose 3	Dose 3 to Dose 4	Dose 4 to Dose 5
Hepatitis B	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	6 weeks	4 weeks	4 weeks	6 months	6 months
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 st 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) 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 st birthday and second dose was administered at younger than 15 months; OR if both doses were PRP-OMP (Pedvaxi-Hib, Comvax) and were administered before the 1 st birthday.	8 weeks (as final dose) This dose only necessary for children age 12 through 59 months who received 3 doses before the 1 st birthday.	
Pneumococcal conjugate	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 st birthday. 8 weeks (as final dose for healthy children) if first dose was administered at the 1 st birthday or after.	No further doses needed for healthy children if previous dose was administered at age 24 months or older. 4 weeks if current age is younger than 12 months and previous dose was administered at <7 months old. 8 weeks (as final dose for healthy children) 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.	8 weeks (as final dose) This dose only necessary for children age 12 through 59 months who received 3 doses before age 12 months or for children at high risk who received 3 doses at any age.	
Inactivated poliovirus	6 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	
Children and adolescents age 7 through 18 years					
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 st birthday. 6 months (as final dose) if first dose of DTaP/DT or Tdap/Td was administered at or after the 1 st birthday.	6 months if first dose of DTaP/DT was administered before the 1 st birthday.	
Human papillomavirus	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.			

Table 3

Recommended Child and Adolescent Immunization Schedule by Medical Indication, United States, 2021

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 ¹		Kidney failure, end-stage renal disease, or on hemodialysis	Heart disease or chronic lung disease	CSF leak or cochlear implant	Asplenia or persistent complement deficiencies	Chronic liver disease	Diabetes
			<15% and total CD4 cell count of <200/mm ³	≥15% and total CD4 cell count of ≥200/mm ³						
Hepatitis B										
Rotavirus		SCID ²								
Diphtheria, tetanus, and acellular pertussis (DTaP)										
<i>Haemophilus influenzae</i> type b										
Pneumococcal conjugate										
Inactivated poliovirus										
Influenza (IIV) or Influenza (LAIV4)										
						Asthma, wheezing: 2–4yrs ³				
Measles, mumps, rubella	*									
Varicella	*									
Hepatitis A										
Tetanus, diphtheria, and acellular pertussis (Tdap)										
Human papillomavirus	*									
Meningococcal ACWY										
Meningococcal B										
Pneumococcal polysaccharide										

Vaccination according to the routine schedule recommended

Recommended for persons with an additional risk factor for which the vaccine would be indicated

Vaccination is recommended, and additional doses may be necessary based on medical condition. See Notes.

Not recommended/contraindicated—vaccine should not be administered

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

No recommendation/not applicable

*Vaccinate after pregnancy.

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

2 Severe Combined Immunodeficiency

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

Notes

Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2021

For vaccination recommendations for persons ages 19 years or older, see the Recommended Adult Immunization Schedule, 2021.

Additional Information

COVID-19 Vaccination

ACIP recommends use of COVID-19 vaccines within the scope of the Emergency Use Authorization or Biologics License Application for the particular vaccine. Interim ACIP recommendations for the use of COVID-19 vaccines can be found at www.cdc.gov/vaccines/hcp/acip-recs/.

- Consult relevant ACIP statements for detailed recommendations at www.cdc.gov/vaccines/hcp/acip-recs/index.html.
- For information on contraindications and precautions for the use of a vaccine, consult the *General Best Practice Guidelines for Immunization* at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html and relevant ACIP statements at www.cdc.gov/vaccines/hcp/acip-recs/index.html.
- For calculating intervals between doses, 4 weeks = 28 days. Intervals of ≥ 4 months are determined by calendar months.
- Within a number range (e.g., 12–18), a dash (–) should be read as “through.”
- Vaccine doses administered ≤ 4 days before the minimum age or interval are considered valid. Doses of any vaccine administered ≥ 5 days earlier than the minimum 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 3-1, Recommended and minimum ages and intervals between vaccine doses, in *General Best Practice Guidelines for Immunization* at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/timing.html.
- Information on travel vaccination requirements and recommendations is available at 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, and Immunization in Special Clinical Circumstances (In: Kimberlin DW, Brady MT, Jackson MA, Long SS, eds. *Red Book: 2018 Report of the Committee on Infectious Diseases*. 31st ed. Itasca, IL: American Academy of Pediatrics; 2018:67–111).
- 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 routine child and adolescent vaccines are covered by VICP except for pneumococcal polysaccharide vaccine (PPSV23). For more information, see www.hrsa.gov/vaccinecompensation/index.html.

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

Routine vaccination

- 5-dose series at 2, 4, 6, 15–18 months, 4–6 years

Primer dose as age appropriate (e.g., 6 weeks for DTaP, 4 years for Kinrix or Quadracel).
Rebooster dose administered if at least 4 years have passed since last dose.

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.

Haemophilus influenzae type b (Hib)

(minimum age: 6 weeks)

Routine vaccination

5-dose series at 2, 4, 6, 15–18 months, 4–6 years

Primer dose as age appropriate (e.g., 6 weeks for Hib, 4 years for Kinrix or Quadracel).

Rebooster dose administered if at least 4 years have passed since last dose.

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) 8 weeks after dose 2.
- 2 doses of PedvaxHIB before age 12 months:** Administer dose 3 (final dose) at 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.

Special situations

Chemotherapy or radiation treatment: 12–59 months

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

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

Hematopoietic stem cell transplant (HSCT):

- 3-dose series 4 weeks apart starting 6 to 12 months after successful transplant, regardless of Hib vaccination history

Anatomic or functional asplenia (including sickle cell disease): 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 5 years or older

- 1 dose

Elective splenectomy:

Unvaccinated* persons age 15 months or older

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

HIV infection: 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 5–18 years

- 1 dose

Immunoglobulin deficiency, early component complement deficiency: 12–59 months

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

*Unvaccinated = Less than routine series (through age 14 months) OR no doses (age 15 months or older)

COVID-19 vaccine recommendations

Recommendations for repeat dose after an invalid dose

Influenza Vaccine Updates

- No change in routine recommendations
- Inactivated influenza vaccines (IIVs), recombinant influenza vaccine (RIV4), and live attenuated influenza vaccine (LAIV4) are available for the 2020–21 season.
- Contraindications and precautions to influenza vaccination were revised

Notes

Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2021

Hepatitis A vaccination

(minimum age: 12 months for routine vaccination)

Routine vaccination

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

Catch-up vaccination

- Unvaccinated persons through age 18 years should complete a 2-dose series (minimum interval: 6 months).
- Persons who previously received 1 dose at age 12 months or older should receive dose 2 at least 6 months after dose 1.
- Adolescents age 18 years or older may receive the combined HepA and HepB vaccine, **Twinrix**, as a 3-dose series (0, 1, and 6 months) or 4-dose series (3 doses at 0, 7, and 21–30 days, followed by a booster dose at 12 months).

International travel

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

Hepatitis B vaccination

(minimum age: birth)

Birth dose (monovalent HepB vaccine only)

- Mother is HBsAg-negative:** 1 dose within 24 hours of birth for all medically stable infants $\geq 2,000$ grams. Infants $< 2,000$ grams: Administer 1 dose at chronological age 1 month or hospital discharge (whichever is earlier and even if weight is still $< 2,000$ grams).
- Mother is HBsAg-positive:**
 - Administer **HepB vaccine** and **hepatitis B immune globulin (HBIG)** (in separate limbs) within 12 hours of birth, regardless of birth weight. For infants $< 2,000$ grams, administer 3 additional doses of vaccine (total of 4 doses) beginning at age 1 month.
 - Test for HBsAg and anti-HBs at age 9–12 months. If HepB series is delayed, test 1–2 months after final dose.
- Mother's HBsAg status is unknown:**
 - Administer **HepB vaccine** within 12 hours of birth, regardless of birth weight.
 - For infants $< 2,000$ grams, administer **HBIG** in addition to HepB vaccine (in separate limbs) within 12 hours of birth. Administer 3 additional doses of vaccine (total of 4 doses) beginning at age 1 month.
 - Determine mother's HBsAg status as soon as possible. If mother is HBsAg-positive, administer **HBIG** to infants $\geq 2,000$ grams as soon as possible, but no later than 7 days of age.

Routine series

- 3-dose series at 0, 1–2, 6–18 months (use monovalent HepB vaccine for doses administered before age 6 weeks)
- Infants who did not receive a birth dose should begin the series as soon as feasible (see Table 2).
- Administration of 4 doses is permitted when a combination vaccine containing HepB is used after the birth dose.

- Minimum age** for the final (3rd or 4th) dose: 24 weeks
- Minimum intervals:** dose 1 to dose 2: 4 weeks / dose 2 to dose 3: 8 weeks / dose 1 to dose 3: 16 weeks (when 4 doses are administered, substitute "dose 4" for "dose 3" in these calculations)

Catch-up vaccination

- Unvaccinated persons should complete a 3-dose series at 0, 1–2, 6 months.
- Adolescents age 11–15 years may use an alternative 2-dose schedule with at least 4 months between doses (adult formulation **Recombivax HB** only).
- Adolescents age 18 years or older may receive a 2-dose series of HepB (**Heplisav-B**) at least 4 weeks apart.
- Adolescents age 18 years or older may receive the combined HepA and HepB vaccine, **Twinrix**, as a 3-dose series (0, 1, and 6 months) or 4-dose series (3 doses at 0, 7, and 21–30 days, followed by a booster dose at 12 months).
- For other catch-up guidance, see Table 2.

Special situations

- Revaccination is not generally recommended for persons with a normal immune status who were vaccinated as infants, children, adolescents,
- Revaccination** including:
 - Infants born
 - Hemodialysis
 - Other imm
- For detailed recommendations, see www.cdc.gov/vaccines/hcp/

Human papillomavirus (HPV) vaccination

(minimum age: 9 years)

Routine and catch-up vaccination

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

Special situations

- Immunocompromised persons
- History of severe allergic reaction to a previous dose of any influenza vaccine or to any vaccine component (excluding egg, see details above)
- Pregnancy

Recommendations for persons with egg allergy other than hives

Influenza vaccination

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

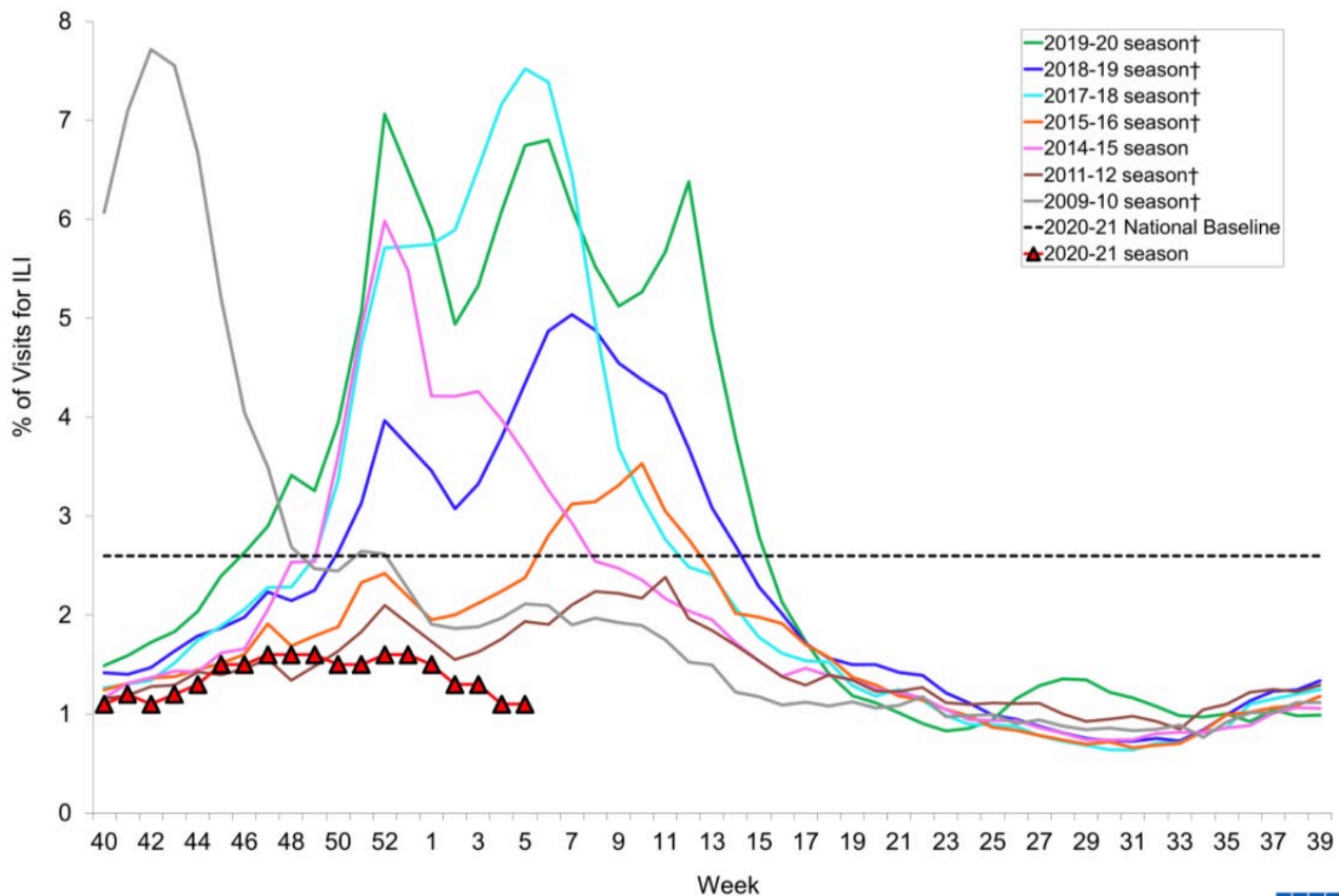
Routine vaccination

- 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, 2020, 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, 2020
 - 1 dose for **all persons age 9 years or older**
- For the 2021–22 season, see the 2021–22 ACIP influenza vaccine recommendations.

Special situations

- Egg allergy, hives only:** Any influenza vaccine appropriate for age and health status annually
- Egg allergy with symptoms other than hives** (e.g., angioedema, respiratory distress, need for emergency medical services or epinephrine): Any influenza vaccine appropriate for age and health status annually. If using an influenza vaccine other than Flublok or Flucelvax, administer in medical setting under supervision of health care provider who can recognize and manage severe allergic reactions.
- Severe allergic reactions to vaccines can occur even in the absence of a history of previous allergic reaction. All vaccination providers should be familiar with the office emergency plan and certified in cardiopulmonary resuscitation.
- A previous severe allergic reaction to influenza vaccine is a contraindication to future receipt of any influenza vaccine.
- LAIV4 should not be used** in persons with the following conditions or situations:
 - History of severe allergic reaction to a previous dose of any influenza vaccine or to any vaccine component (excluding egg, see details above)
 - Receiving aspirin or salicylate-containing medications
 - Age 2–4 years with history of asthma or wheezing
 - Immunocompromised due to any cause (including medications and HIV infection)
 - Anatomic or functional asplenia
 - Close contacts or caregivers of severely immunosuppressed persons who require a protected environment
 - Pregnancy
 - Cochlear implant
 - Cerebrospinal fluid-opharyngeal communication
 - Children less than age 2 years
 - 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

Percentage of Visits for Influenza-like Illness (ILI) Reported by
the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet),
Weekly National Summary, 2020-2021 and Selected Previous Seasons



†These seasons did not have a week 53, so the week 53 value is an average of week 52 and week 1.

2021-2022 US Egg-based Influenza Vaccine Strains

Trivalent

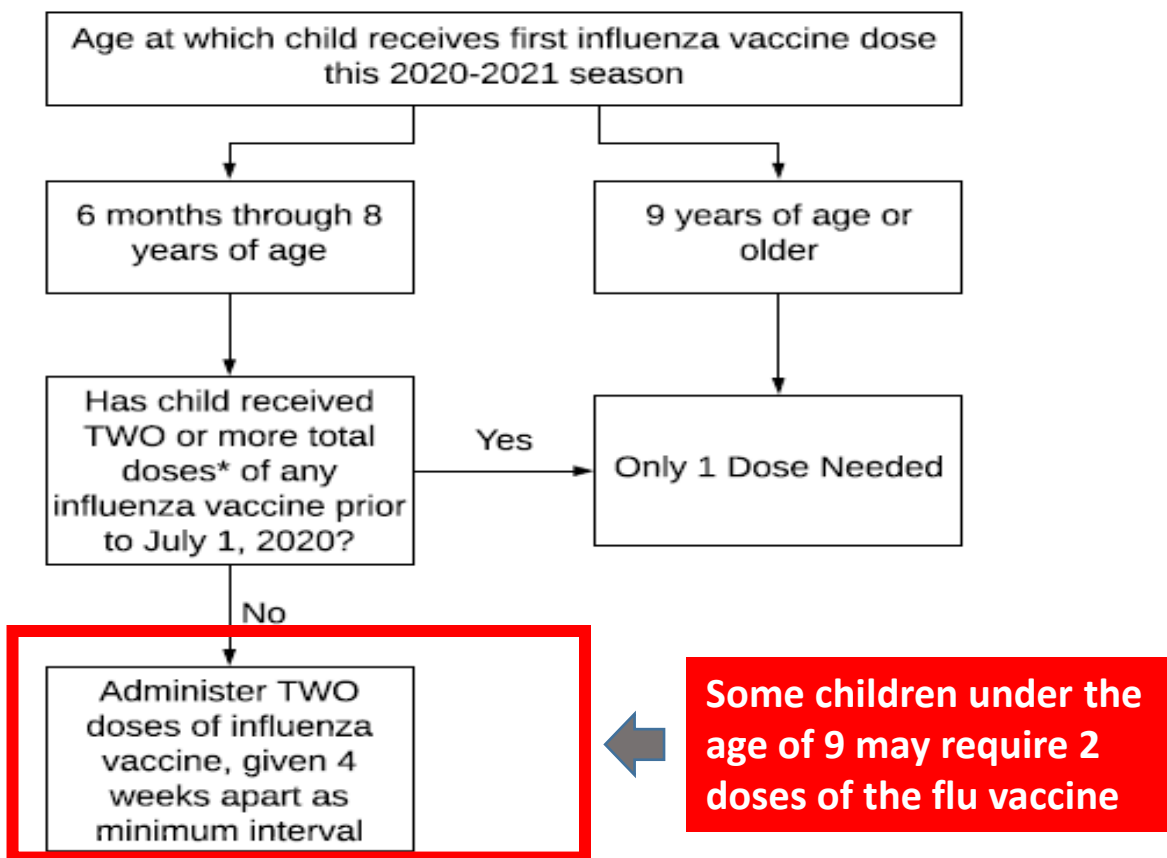
- A/Victoria/2570/2019 (H1N1)pdm09-virus
- A/Cambodia/e0826360/2020 (H3N2)-like virus
- B/Washington/02/2019 (Victoria lineage)-like virus

Quadrivalent

- Adds B/Phuket/3073/2013 (Yamagata lineage)-like virus

2 strain changes from last season

Figure 2. Determining number of 2020-2021 seasonal influenza doses to administer based on age and prior vaccination history..



* The 2 doses need not have been received during the same season or consecutive seasons.

Meningococcal ACWY Vaccine Updates

- Recommendations for use of newly licensed MenACWY-TT (MenQuadfi) for preventing disease attributed to meningococcal serogroups A, C, W, and Y.
- Recommendations for catch-up vaccination with MenACWY-CRM (Menveo) in infants who received dose 1 at age 3–6 months.

Notes

Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2021

Measles, mumps, and rubella vaccination (minimum age: 12 months for routine vaccination)

Routine vaccination

- 2-dose series at 12–15 months, 4–6 years
- Dose 2 may be administered as early as 4 weeks after dose 1.

Catch-up vaccination

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

Special situations

International travel

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

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 11–12 years, 16 years

Catch-up vaccination

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

Special situations

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

- **Menveo**
 - Dose 1 at age 8 weeks: 4-dose series at 2, 4, 6, 12 months
 - Dose 1 at age 3–6 months: 3- or 4- dose series (dose 2 [and dose 3 if applicable] at least 8 weeks after previous dose until a dose is received at age 7 months or older, followed by an additional dose at least 12 weeks later and after age 12 months)
 - Dose 1 at age 7–23 months: 2-dose series (dose 2 at least 12 weeks after dose 1 and after age 12 months)
 - Dose 1 at age 24 months or older: 2-dose series at least 8 weeks apart
- **Menactra**
 - **Persistent complement component deficiency or complement inhibitor use:**
 - Age 9–23 months: 2-dose series at least 12 weeks apart
 - Age 24 months or older: 2-dose series at least 8 weeks apart
 - **Anatomic or functional asplenia, sickle cell disease, or HIV infection:**
 - Age 9–23 months: Not recommended
 - Age 24 months or older: 2-dose series at least 8 weeks apart
 - **Menactra** must be administered at least 4 weeks after completion of PCV13 series

MenQuadfi

- Dose 1 at age 24 months or older: 2-dose series at least 8 weeks apart

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

- Children less than age 24 months:

Menveo (age 2–23 months)

- Dose 1 at age 8 weeks: 4-dose series at 2, 4, 6, 12 months
- Dose 1 at age 3–6 months: 3- or 4- dose series (dose 2 [and dose 3 if applicable] at least 8 weeks after previous dose until a dose is received at age 7 months or older, followed by an additional dose at least 12 weeks later and after age 12 months)
- Dose 1 at age 7–23 months: 2-dose series (dose 2 at least 12 weeks after dose 1 and after age 12 months)

Menactra (age 9–23 months)

- 2-dose series (dose 2 at least 12 weeks after dose 1; dose 2 may be administered as early as 8 weeks after dose 1 in

MenQuadfi added to list for routine, catch-up vaccination, and special situations

Adolescent vaccination of children who received MenACWY prior to age 10 years:

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

Note: Menactra should be administered either before or at the same time as DTaP. For MenACWY booster dose

Menveo catch-up revised

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 3rd dose at least 4 months after dose 2.

Special situations

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

- **Bexsero:** 2-dose series at least 1 month apart
 - **Trumenba:** 3-dose series at 0, 1–2, 6 months
- Bexsero and Trumenba** are not interchangeable; the same product should be used for all doses in a series.

For MenB booster dose recommendations for persons listed

Menveo catch-up revised

Pneumococcal vaccination

(minimum age: 6 weeks [PCV13], 2 years [PPSV23])

Routine vaccination with PCV13

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

Catch-up vaccination with PCV13

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

Special situations

Underlying conditions below: When both PCV13 and PPSV23 are indicated, administer PCV13 first. PCV13 and PPSV23 should not be administered during same visit.

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

Age 2–5 years

- Any incomplete* series with:
 - 3 PCV13 doses: 1 dose PCV13 (at least 8 weeks after any prior PCV13 dose)
 - Less than 3 PCV13 doses: 2 doses PCV13 (8 weeks after the most recent dose and administered 8 weeks apart)
- No history of PPSV23: 1 dose PPSV23 (at least 8 weeks after completing all recommended PCV13 doses)

Age 6–18 years

- No history of PPSV23: 1 dose PPSV23 (at least 8 weeks after completing all recommended PCV13 doses)

Cerebrospinal fluid leak, cochlear implant:

Age 2–5 years

- Any incomplete* series with:
 - 3 PCV13 doses: 1 dose PCV13 (at least 8 weeks after any prior PCV13 dose)
 - Less than 3 PCV13 doses: 2 doses PCV13 (8 weeks after the most recent dose and administered 8 weeks apart)
- No history of PPSV23: 1 dose PPSV23 (at least 8 weeks after any prior PCV13 dose)

Age 6–18 years

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

Two MenB Vaccines

Vaccine	Age Group	Recommended Vaccination Schedule	Administration
Bexsero (MenB-4C)	10–25 yrs, at increased risk	2 dose series (1 month apart)	Intramuscular
Trumenba (MenB-FHbp)	10–25 yrs, at increased risk	2 dose series (6 months apart) 3 dose series (0,2,6 months)	Intramuscular

Patton ME, Stephens D, Moore K, et al. Updated recommendations for use of MenB-FHbp serogroup B meningococcal vaccine – Advisory Committee on Immunization Practices, 2016. *MMWR*. 2017;66(19):509–513. DOI: <http://dx.doi.org/10.15585/mmwr.mm6619a6>

Shared Clinical Decision-Making

- Patient/parents/family and provider discuss potential benefits and come to a personalized decision together.
- CDC/ACIP has 4 such vaccine recommendations:
 - ✓ **Meningococcal B (MenB)** for adolescents and young adults aged 16–23 years
 - ✓ **Hepatitis B (Hep B)** for adults 60 years and older with diabetes
 - ✓ **Human Papillomavirus (HPV)** for adults 27–45 years
 - ✓ **Pneumococcal conjugate vaccination (PCV13)** for adults 65 years and older without an immunocompromising condition, cerebrospinal fluid leak, or cochlear implant

MenB Vaccine Recommendations

- Recommendations for persons aged ≥ 10 years with complement deficiency, complement inhibitor use, or asplenia, or who are microbiologists
- Recommendations for persons aged ≥ 10 years determined by public health officials to be at an increased risk during an outbreak

Notes

Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2021

For vaccination recommendations for persons ages 19 years or older, see the Recommended Adult Immunization Schedule, 2021.

Additional Information

COVID-19 Vaccination

ACIP recommends use of COVID-19 vaccines within the scope of the Emergency Use Authorization or Biologics License Application for the particular vaccine. Interim ACIP recommendations for the use of COVID-19 vaccines can be found at www.cdc.gov/vaccines/hcp/acip-recs/.

- Consult relevant ACIP statements for detailed recommendations at www.cdc.gov/vaccines/hcp/acip-recs/index.html.
- For information on contraindications and precautions for the use of a vaccine, consult the *General Best Practice Guidelines for Immunization* at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html and relevant ACIP statements at www.cdc.gov/vaccines/hcp/acip-recs/index.html.
- For calculating intervals between doses, 4 weeks = 28 days. Intervals of ≥4 months are determined by calendar months.
- Within a number range (e.g., 12–18), a dash (–) should be read as “through.”
- Vaccine doses administered ≤4 days before the minimum age or interval are considered valid. Doses of any vaccine administered ≥5 days earlier than the minimum 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 3–1, Recommended and minimum ages and intervals between vaccine doses, in *General Best Practice Guidelines for Immunization* at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/timing.html.
- Information on travel vaccination requirements and recommendations is available at 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, and *Immunization in Special Clinical Circumstances* (In: Kimberlin DW, Brady MT, Jackson MA, Long SS, eds. *Red Book: 2018 Report of the Committee on Infectious Diseases*. 31st ed. Itasca, IL: American Academy of Pediatrics; 2018:67–111).
- 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 routine child and adolescent vaccines are covered by VICP except for pneumococcal polysaccharide vaccine (PPSV23). For more information, see www.hrsa.gov/vaccinecompensation/index.html.

Diphtheria, tetanus, and pertussis (DTaP) vaccination (minimum age: 6 weeks [4 years for Kinrix or Quadrate])

Routine vaccination

- 5-dose series at 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 4th 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 12 months of age: For all wounds except clean and minor wounds, administer DTaP if more than 5 years since last dose of tetanus-toxoid-containing vaccine. For detailed information, see www.cdc.gov/mmwr/volumes/67/rr/r6702a1.htm.

Haemophilus Influenzae type b vaccination (minimum age: 6 weeks)

Routine vaccination

- ActHIB, Hibrix, or Pentacel:** 4-dose series at 2, 4, 6, 12–15 months
- PedvaxHIB:** 3-dose series at 2, 4, 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) 8 weeks after dose 2.
- 2 doses of PedvaxHIB before age 12 months:** Administer dose 3 (final dose) at 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.

Special situations

Chemotherapy or radiation treatment:

12–59 months

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

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

Hematopoietic stem cell transplant (HSCT):

- 3-dose series 4 weeks apart starting 6 to 12 months after successful transplant, regardless of Hib vaccination history

Functional asplenia (including sickle cell disease):

- 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 5 years or older

- 1 dose

Elective splenectomy:

Unvaccinated* persons age 15 months or older

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

HIV infection:

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 5–18 years

- 1 dose

Immunoglobulin deficiency, early component complement deficiency:

12–59 months

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

*Unvaccinated = Less than routine series (through age 14 months) OR no doses (age 15 months or older)

Wound management recommendations

Notes

Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2021

For vaccination recommendations for persons ages 19 years or older, see the Recommended Adult Immunization Schedule, 2021.

Additional Information

COVID-19 Vaccination

ACIP recommends use of COVID-19 vaccines within the scope of the Emergency Use Authorization or Biologics License Application for the particular vaccine. Interim ACIP recommendations for the use of COVID-19 vaccines can be found at www.cdc.gov/vaccines/hcp/acip-recs/.

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- For information on contraindications and precautions for the use of a vaccine, consult the *General Best Practice Guidelines for Immunization* at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html and relevant ACIP statements at www.cdc.gov/vaccines/hcp/acip-recs/index.html.
- For calculating intervals between doses, 4 weeks = 28 days. Intervals of ≥4 months are determined by calendar months.
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- For information about vaccination in the setting of a vaccine-preventable disease outbreak, contact your state or local health department.
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Diphtheria, tetanus, and pertussis (DTaP) vaccination (minimum age: 6 weeks [4 years for Kinrix or Quadracel])

Routine vaccination

- 5-dose series at 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 4th dose that was inadvertently administered as early as age 12 months may be counted if at least 4 months have elapsed since dose 3.

Catch-up vaccination

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

Special situations

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

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

Routine vaccination

- ActHIB, Hibrix, or Pentacel:** 4-dose series at 2, 4, 6, 12–15 months
- PedvaxHIB:** 3-dose series at 2, 4, 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) 8 weeks after dose 2.
- 2 doses of PedvaxHIB before age 12 months:** Administer dose 3 (final dose) at 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.

Special situations

Chemotherapy or radiation treatment:

- 12–59 months:**
 - Unvaccinated or only 1 dose before age 12 months: 2 doses, 8 weeks apart
 - 2 or more doses before age 12 months: 1 dose at least 8 weeks after previous dose

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

Hematopoietic stem cell transplant (HSCT):

- 3-dose series 4 weeks apart starting 6 to 12 months after successful transplant, regardless of Hib vaccination history

Anatomic or functional asplenia (including sickle cell disease):

- 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 5 years or older

- 1 dose
- Elective splenectomy:**
 - Unvaccinated* persons age 15 months or older*
 - 1 dose (preferably at least 14 days before procedure)

HIV infection:

- 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 5–18 years

- 1 dose
- Immunoglobulin deficiency, early component complement deficiency:**
 - 12–59 months*

Catch up vaccination when no further dose is needed

Notes

Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2021

Hepatitis A vaccination

(minimum age: 12 months for routine vaccination)

Routine vaccination

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

Catch-up vaccination

- Unvaccinated persons through age 18 years should complete a 2-dose series (minimum interval: 6 months).
- Persons who previously received 1 dose at age 12 months or older should receive dose 2 at least 6 months after dose 1.
- Adolescents age 18 years or older may receive the combined HepA and HepB vaccine, **Twinrix**, as a 3-dose series (0, 1, and 6 months) or 4-dose series (3 doses at 0, 7, and 21–30 days, followed by a booster dose at 12 months).

International travel

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

Hepatitis B vaccination

(minimum age: birth)

Birth dose (monovalent HepB vaccine only)

- **Mother is HBsAg-negative:** 1 dose within 24 hours of birth for all medically stable infants $\geq 2,000$ grams. Infants $< 2,000$ grams: Administer 1 dose at chronological age 1 month or hospital discharge (whichever is earlier and even if weight is still $< 2,000$ grams).
- **Mother is HBsAg-positive:**
 - Administer **HepB vaccine** and **hepatitis B immune globulin (HBIG)** (in separate limbs) within 12 hours of birth, regardless of birth weight. For infants $< 2,000$ grams, administer 3 additional doses of vaccine (total of 4 doses) beginning at age 1 month.
 - Test for HBsAg and anti-HBs at age 9–12 months. If HepB series is delayed, test 1–2 months after final dose.
- **Mother's HBsAg status is unknown:**
 - Administer **HepB vaccine** within 12 hours of birth, regardless of birth weight.
 - For infants $< 2,000$ grams, administer **HBIG** in addition to HepB vaccine (in separate limbs) within 12 hours of birth. Administer 3 additional doses of vaccine (total of 4 doses) beginning at age 1 month.
 - Determine mother's HBsAg status as soon as possible. If mother is HBsAg-positive, administer **HBIG** to infants $\geq 2,000$ grams as soon as possible, but no later than 7 days of age.

Routine series

- 3-dose series at 0, 1–2, 6–18 months (use monovalent HepB vaccine for doses administered before age 6 weeks)
- Infants who did not receive a birth dose should begin the series as soon as feasible (see Table 2).
- Administration of **4 doses** is permitted when a combination vaccine containing HepB is used after the birth dose.

- **Minimum age** for the final (3rd or 4th) dose: 24 weeks
- **Minimum intervals:** dose 1 to dose 2: 4 weeks / dose 2 to dose 3: 8 weeks / dose 1 to dose 3: 16 weeks (when 4 doses are administered, substitute "dose 4" for "dose 3" in these calculations)

Catch-up vaccination

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

Special situations

- Revaccination is not generally recommended for persons with a normal immune status who were vaccinated as infants, children, adolescents, or adults.
- **Revaccination** may be recommended for certain populations, including:
 - **Infants born to HBsAg-positive mothers**
 - **Hemodialysis patients**
 - **Other immunocompromised persons**
- For detailed revaccination recommendations, see www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/hepb.html.

Human papillomavirus vaccination

(minimum age: 9 years)

Routine and catch-up vaccination

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

Special situations

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

Twinrix 4-dose series clarification

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, 2020, 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, 2020
 - 1 dose for **all persons age 9 years or older**
- For the 2021–22 season, see the 2021–22 ACIP influenza vaccine recommendations.

Special situations

- **Egg allergy, hives only:** Any influenza vaccine appropriate for age and health status annually
- **Egg allergy with symptoms other than hives** (e.g., angioedema, respiratory distress, need for emergency medical services or epinephrine): Any influenza vaccine appropriate for age and health status annually. If using an influenza vaccine other than Flublok or Flucelvax, administer in medical setting under supervision of health care provider who can recognize and manage severe allergic reactions.
- Severe allergic reactions to vaccines can occur even in the absence of a history of previous allergic reaction. All vaccination providers should be familiar with the office emergency plan and certified in cardiopulmonary resuscitation.
- A previous severe allergic reaction to influenza vaccine is a contraindication to future receipt of any influenza vaccine.
- **LAIV4 should not be used** in persons with the following conditions or situations:
 - History of severe allergic reaction to a previous dose of any influenza vaccine or to any vaccine component (excluding egg, see details above)
 - Receiving aspirin or salicylate-containing medications
 - Age 2–4 years with history of asthma or wheezing
 - Immunocompromised due to any cause (including medications and HIV infection)
 - Anatomic or functional asplenia
 - Close contacts or caregivers of severely immunosuppressed persons who require a protected environment
 - Pregnancy
 - Cochlear implant
 - Cerebrospinal fluid–oropharyngeal communication
 - Children less than age 2 years
 - 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

Notes

Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2021

Hepatitis A vaccination

(minimum age: 12 months for routine vaccination)

Routine vaccination

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

Catch-up vaccination

- Unvaccinated persons through age 18 years should complete a 2-dose series (minimum interval: 6 months).
- Persons who previously received 1 dose at age 12 months or older should receive dose 2 at least 6 months after dose 1.
- Adolescents age 18 years or older may receive the combined HepA and HepB vaccine, **Twinrix**, as a 3-dose series (0, 1, and 6 months) or 4-dose series (3 doses at 0, 7, and 21–30 days, followed by a booster dose at 12 months).

International travel

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

Hepatitis B vaccination

(minimum age: birth)

Birth dose (monovalent HepB vaccine only)

- **Mother is HBsAg-negative:** 1 dose within 24 hours of birth for **all** medically stable infants $\geq 2,000$ grams. Infants $< 2,000$ grams: Administer 1 dose at chronological age 1 month or hospital discharge (whichever is earlier and even if weight is still $< 2,000$ grams).
- **Mother is HBsAg-positive:**
 - Administer **HepB vaccine** and **hepatitis B immune globulin (HBIG)** (in separate limbs) within 12 hours of birth, regardless of birth weight. For infants $< 2,000$ grams, administer 3 additional doses of vaccine (total of 4 doses) beginning at age 1 month.
 - Test for HBsAg and anti-HBs at age 9–12 months. If HepB series is delayed, test 1–2 months after final dose.
- **Mother's HBsAg status is unknown:**
 - Administer **HepB vaccine** within 12 hours of birth, regardless of birth weight.
 - For infants $< 2,000$ grams, administer **HBIG** in addition to HepB vaccine (in separate limbs) within 12 hours of birth. Administer 3 additional doses of vaccine (total of 4 doses) beginning at age 1 month.
 - Determine mother's HBsAg status as soon as possible. If mother is HBsAg-positive, administer **HBIG** to infants $\geq 2,000$ grams as soon as possible, but no later than 7 days of age.

Routine series

- 3-dose series at 0, 1–2, 6–18 months (use monovalent HepB vaccine for doses administered before age 6 weeks)
- Infants who did not receive a birth dose should begin the series as soon as feasible (see Table 2).
- Administration of **4 doses** is permitted when a combination vaccine containing HepB is used after the birth dose.

- **Minimum age** for the final (3rd or 4th) dose: 24 weeks
- **Minimum intervals:** dose 1 to dose 2: 4 weeks / dose 2 to dose 3: 8 weeks / dose 1 to dose 3: 16 weeks (when 4 doses are administered, substitute "dose 4" for "dose 3" in these calculations)

Catch-up vaccination

- Unvaccinated persons should complete a 3-dose series at 0, 1–2, 6 months.
- Adolescents age 11–15 years may use an alternative 2-dose schedule with at least 4 months between doses (adult formulation **Recombivax HB** only).
- Adolescents age 18 years or older may receive a 2-dose series of HepB (**Heplisav-B**) at least 4 weeks apart.
- Adolescents age 18 years or older may receive the combined HepA and HepB vaccine, **Twinrix**, as a 3-dose series (0, 1, and 6 months) or 4-dose series (3 doses at 0, 7, and 21–30 days, followed by a booster dose at 12 months).
- For other catch-up guidance, see Table 2.

Special situations

- Revaccination is not generally recommended for persons with a normal immune status who were vaccinated as infants, children, adolescents, or adults.
- **Revaccination** may be recommended for certain populations, including:
 - **Infants born to HBsAg-positive mothers**
 - **Hemodialysis patients**
 - **Other immunocompromised persons**
- For details on vaccination, see Table 2.

Birth dose for <2000 grams; HBsAg-negative mom

Routine series

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

Special situations

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

Influenza vaccination

(minimum age: 6 months [IIV], 2 years [LAIV4], 18 years [recombinant influenza vaccine, RV4])

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, 2020, or whose influenza vaccination history is unknown (administer dose 2 even if the child has received 1 dose)
 - 1 dose for all other persons
- For other catch-up guidance, see Table 2.

Twinrix 4-dose series clarification

Special situations

- **Egg allergy, hives only:** Any influenza vaccine appropriate for age and health status annually
- **Egg allergy with symptoms other than hives** (e.g., angioedema, respiratory distress, need for emergency medical services or epinephrine): Any influenza vaccine appropriate for age and health status annually. If using an influenza vaccine other than Flublok or Flucelvax, administer in medical setting under supervision of health care provider who can recognize and manage severe allergic reactions.
- Severe allergic reactions to vaccines can occur even in the absence of a history of previous allergic reaction. All vaccination providers should be familiar with the office emergency plan and certified in cardiopulmonary resuscitation.
- A previous severe allergic reaction to influenza vaccine is a contraindication to future receipt of any influenza vaccine.
- **LAIV4 should not be used** in persons with the following conditions or situations:
 - History of severe allergic reaction to a previous dose of any influenza vaccine or to any vaccine component (excluding egg, see details above)
 - Receiving aspirin or salicylate-containing medications
 - Age 2–4 years with history of asthma or wheezing
 - Immunocompromised due to any cause (including medications and HIV infection)
 - Anatomic or functional asplenia
 - Close contacts or caregivers of severely immunosuppressed persons who require a protected environment
 - Pregnancy
 - Cochlear implant
 - Cerebrospinal fluid-opharyngeal communication
 - Children less than age 2 years
 - 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

Hepatitis A vaccination

(minimum age: 12 months for routine vaccination)

Routine vaccination

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

Catch-up vaccination

- Unvaccinated persons through age 18 years should complete a 2-dose series (minimum interval: 6 months).
- Persons who previously received 1 dose at age 12 months or older should receive dose 2 at least 6 months after dose 1.
- Adolescents age 18 years or older may receive the combined HepA and HepB vaccine, **Twinrix**, as a 3-dose series (0, 1, and 6 months) or 4-dose series (3 doses at 0, 7, and 21–30 days, followed by a booster dose at 12 months).

International travel

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

Hepatitis B vaccination

(minimum age: birth)

Birth dose (monovalent HepB vaccine only)

- **Mother is HBsAg-negative:** 1 dose within 24 hours of birth for all medically stable infants $\geq 2,000$ grams. Infants $< 2,000$ grams: Administer 1 dose at chronological age 1 month or hospital discharge (whichever is earlier and even if weight is still $< 2,000$ grams).
- **Mother is HBsAg-positive:**
 - Administer **HepB vaccine** and **hepatitis B immune globulin (HBIG)** (in separate limbs) within 12 hours of birth, regardless of birth weight. For infants $< 2,000$ grams, administer 3 additional doses of vaccine (total of 4 doses) beginning at age 1 month.
 - Test for HBsAg and anti-HBs at age 9–12 months. If HepB series is delayed, test 1–2 months after final dose.
- **Mother's HBsAg status is unknown:**
 - Administer **HepB vaccine** within 12 hours of birth, regardless of birth weight.
 - For infants $< 2,000$ grams, administer **HBIG** in addition to HepB vaccine (in separate limbs) within 12 hours of birth. Administer 3 additional doses of vaccine (total of 4 doses) beginning at age 1 month.
 - Determine mother's HBsAg status as soon as possible. If mother is HBsAg-positive, administer **HBIG** to infants $\geq 2,000$ grams as soon as possible, but no later than 7 days of age.

Routine series

- 3-dose series at 0, 1–2, 6–18 months (use monovalent HepB vaccine for doses administered before age 6 weeks)
- Infants who did not receive a birth dose should begin the series as soon as feasible (see Table 2).
- Administration of **4 doses** is permitted when a combination vaccine containing HepB is used after the birth dose.

- **Minimum age** for the final (3rd or 4th) dose: 24 weeks
- **Minimum intervals:** dose 1 to dose 2: 4 weeks / dose 2 to dose 3: 8 weeks / dose 1 to dose 3: 16 weeks (when 4 doses are administered, substitute "dose 4" for "dose 3" in these calculations)

Catch-up vaccination

- Unvaccinated persons should complete a 3-dose series at 0, 1–2, 6 months.
- Adolescents age 11–15 years may use an alternative 2-dose schedule with at least 4 months between doses (adult formulation **Recombivax HB** only).
- Adolescents age 18 years or older may receive a 2-dose series of HepB (**Heplisav-B**) at least 4 weeks apart.
- Adolescents age 18 years or older may receive the combined HepA and HepB vaccine, **Twinrix**, as a 3-dose series (0, 1, and 6 months) or 4-dose series (3 doses at 0, 7, and 21–30 days, followed by a booster dose at 12 months).
- For other catch-up guidance, see Table 2.

Special situations

- Revaccination is not generally recommended for persons with a normal immune status who were vaccinated as infants, children, adolescents, or adults.
- **Revaccination** may be recommended for certain populations, including:
 - **Infants born to HBsAg-positive mothers**
 - **Hemodialysis patients**
 - **Other immunocompromised persons**
- For detailed revaccination recommendations, see www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/hepb.html.

Human papillomavirus vaccination

(minimum age: 9 years)

Routine and catch-up vaccination

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

Special situations

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

Influenza vaccination

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

Routine vaccination

- Use any influenza vaccine appropriate for age and health status annually:
 - 2 doses, separated by at least 4 weeks, for **children age 6 months–8 years** who have received fewer than 2 influenza vaccine doses before July 1, 2020, 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, 2020
 - 1 dose for **all persons age 9 years or older**
- For the 2021–22 season, see the 2021–22 ACIP influenza vaccine recommendations.

Special situations

- **Egg allergy, hives only:** Any influenza vaccine appropriate for age and health status annually
- **Egg allergy with symptoms other than hives** (e.g., angioedema, respiratory distress, need for emergency medical services or epinephrine): Any influenza vaccine appropriate for age and health status annually. If using an influenza vaccine other than Flublok or Flucelvax, administer in medical setting under supervision of health care provider who can recognize and manage severe allergic reactions.
- Severe allergic reactions to vaccines can occur even in the absence of a history of previous allergic reaction. All vaccination providers should be familiar with the office emergency plan and certified in cardiopulmonary resuscitation.
- A previous severe allergic reaction to influenza vaccine is a contraindication to future receipt of any influenza vaccine.
- **LAIV4 should not be used** in persons with the following conditions or situations:
 - History of severe allergic reaction to a previous dose of any influenza vaccine or to any vaccine component (excluding egg, see details above)
 - Receiving aspirin or salicylate-containing medications
 - Age 2–4 years with history of asthma or wheezing
 - Immunosuppression
 - Anatomic or functional airway obstruction
 - Pregnancy
 - Cochlear implants
 - Cerebrospinal fluid leaks
 - Children less than age 2 years
 - 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

Recommendations for interrupted schedule

Measles, mumps, and rubella vaccination (minimum age: 12 months for routine vaccination)

Routine vaccination

- 2-dose series at 12–15 months, 4–6 years
- Dose 2 may be administered as early as 4 weeks after dose 1.

Catch-up vaccination

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

Special situations

International travel

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

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 11–12 years, 16 years

Catch-up vaccination

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

Special situations

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

- **Menveo**
 - Dose 1 at age 8 weeks: 4-dose series at 2, 4, 6, 12 months
 - Dose 1 at age 3–6 months: 3- or 4- dose series (dose 2 [and dose 3 if applicable] at least 8 weeks after previous dose until a dose is received at age 7 months or older, followed by an additional dose at least 12 weeks later and after age 12 months)
 - Dose 1 at age 7–23 months: 2-dose series (dose 2 at least 12 weeks after dose 1 and after age 12 months)
 - Dose 1 at age 24 months or older: 2-dose series at least 8 weeks apart
- **Menactra**
 - **Persistent complement component deficiency or complement inhibitor use:**
 - Age 9–23 months: 2-dose series at least 12 weeks apart
 - Age 24 months or older: 2-dose series at least 8 weeks apart
 - **Anatomic or functional asplenia, sickle cell disease, or HIV infection:**
 - Age 9–23 months: Not recommended
 - Age 24 months or older: 2-dose series at least 8 weeks apart
 - **Menactra** must be administered at least 4 weeks after completion of PCV13 series.

MenQuadfi

- Dose 1 at age 24 months or older: 2-dose series at least 8 weeks apart

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

- Children less than age 24 months:

- Menveo (age 2–23 months)

- Dose 1 at age 8 weeks: 4-dose series at 2, 4, 6, 12 months
- Dose 1 at age 3–6 months: 3- or 4- dose series (dose 2 [and dose 3 if applicable] at least 8 weeks after previous dose until a dose is received at age 7 months or older, followed by an additional dose at least 12 weeks later and after age 12 months)
- Dose 1 at age 7–23 months: 2-dose series (dose 2 at least 12 weeks after dose 1 and after age 12 months)

- Menactra (age 9–23 months)

- 2-dose series (dose 2 at least 12 weeks after dose 1; dose 2 may be administered as early as 8 weeks after dose 1 in travelers)

“High-risk” changed to “Underlying” conditions

...cause of an ongoing increased risk of meningococcal disease (e.g., those with complement deficiency, HIV, or asplenia): Follow the booster schedule for persons at increased risk.

- **Children for whom boosters are not recommended** (e.g., a healthy child who received a single dose for travel to a country where meningococcal disease is endemic): Administer MenACWY with dose 1

PPSV23 given at least 8 weeks after completing all PCV13 doses

(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 3rd dose at least 4 months after dose 2.

Special situations

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

- **Bexsero:** 2-dose series at least 1 month apart
 - **Trumenba:** 3-dose series at 0, 1–2, 6 months
- Bexsero and Trumenba are not interchangeable;** the same product should be used for all doses in a series. For **MenB booster dose recommendations** for groups listed under “Special situations” and in an outbreak setting and additional meningococcal vaccination information, see www.cdc.gov/mmwr/volumes/69/rr/rr6909a1.htm.

Pneumococcal vaccination

(minimum age: 6 weeks [PCV13], 2 years [PPSV23])

Routine vaccination with PCV13

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

Catch-up vaccination with PCV13

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

Special situations

Underlying conditions below: When both PCV13 and PPSV23 are indicated, administer PCV13 first. PCV13 and PPSV23 should not be administered during same visit.

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

Age 2–5 years

- Any incomplete* series with:
 - 3 PCV13 doses: 1 dose PCV13 (at least 8 weeks after any prior PCV13 dose)
 - Less than 3 PCV13 doses: 2 doses PCV13 (8 weeks after the most recent dose and administered 8 weeks apart)
- **No history of PPSV23:** 1 dose PPSV23 (at least 8 weeks after completing all recommended PCV13 doses)

Age 6–18 years

- **No history of PPSV23:** 1 dose PPSV23 (at least 8 weeks after completing all recommended PCV13 doses)

Cerebrospinal fluid leak, cochlear implant:

Age 2–5 years

- Any incomplete* series with:
 - 3 PCV13 doses: 1 dose PCV13 (at least 8 weeks after any prior PCV13 dose)
 - Less than 3 PCV13 doses: 2 doses PCV13 (8 weeks after the most recent dose and administered 8 weeks apart)
- **No history of PPSV23:** 1 dose PPSV23 (at least 8 weeks after any prior PCV13 dose)

Age 6–18 years

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

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

Age 2–5 years

- Any incomplete* series with:
 - 3 PCV13 doses: 1 dose PCV13 (at least 8 weeks after any prior PCV13 dose)
 - Less than 3 PCV13 doses: 2 doses PCV13 (8 weeks after the most recent dose and administered 8 weeks apart)
- No history of PPSV23: 1 dose PPSV23 (at least 8 weeks after any prior PCV13 dose) and a 2nd dose of PPSV23 5 years later

Age 6–18 years

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

Chronic liver disease, alcoholism:

Age 6–18 years

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

*Incomplete series = Not having received all doses in either the recommended series or an age-appropriate catch-up series. See Tables 8, 9, and 11 in the ACIP pneumococcal vaccine recommendations (www.cdc.gov/mmwr/pdf/rr/rr5911.pdf) for complete schedule details.

Poliovirus vaccination (minimum age: 6 weeks)

Routine vaccination

- 4-dose series at ages 2, 4, 6–18 months, 4–6 years; administer the final dose on or after age 4 years and at least 6 months after the previous dose.
- 4 or more doses of IPV can be administered before age 4 years when a combination vaccine containing IPV is used. However, a dose is still recommended on or after age 4 years and at least 6 months after the previous dose.

Catch-up vaccination

- In the first 6 months of life, use minimum ages and intervals only for travel to a polio-endemic region or during an outbreak.
- IPV is not routinely recommended for U.S. residents age 18 years or older.

Series containing oral polio vaccine (OPV), either mixed OPV-IPV or OPV-only series:

- Total number of doses needed to complete the series is the same as that recommended for the U.S. IPV schedule. See www.cdc.gov/mmwr/volumes/66/wr/mm6601a6.htm?s_20cid=mm6601a6_w.
- Only trivalent OPV (tOPV) counts toward the U.S. vaccination requirements.
 - Doses of OPV administered before April 1, 2016, should be counted.
 - Doses of OPV administered after April 1, 2016, should not be counted.
 - For guidance, see www.cdc.gov/mmwr/volumes/66/wr/mm6601a6.htm?s_20cid=mm6601a6_w.
- For other catch-up guidance, see Table 2.

Wound
management
recommendations

Rotavirus vaccination (minimum age: 6 weeks)

Routine vaccination

- Rotarix:** 2-dose series at 2 and 4 months
- RotaTaq:** 3-dose series at 2, 4, and 6 months
- If any dose in the series is either **RotaTaq** or unknown, default to 3-dose series.

Catch-up vaccination

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

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

Routine vaccination

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

Catch-up vaccination

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

Special situations

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

*Fully vaccinated = 5 valid doses of DTaP OR 4 valid doses of DTaP if dose 4 was administered at age 4 years or older

Varicella vaccination (minimum age: 12 months)

Routine vaccination

- 2-dose series at 12–15 months, 4–6 years
- Dose 2 may be administered as early as 3 months after dose 1 (a dose administered after a 4-week interval may be counted).

Catch-up vaccination

- Ensure persons age 7–18 years without evidence of immunity (see [MMWR](http://www.cdc.gov/mmwr/pdf/rr/rr5604.pdf) at www.cdc.gov/mmwr/pdf/rr/rr5604.pdf) have a 2-dose series:
 - **Age 7–12 years:** routine interval: 3 months (a dose administered after a 4-week interval may be counted)
 - **Age 13 years and older:** routine interval: 4–8 weeks (minimum interval: 4 weeks)
 - The maximum age for use of MMRV is 12 years.

COVID mRNA Vaccines



Pfizer BioNTech

- 2 doses: 0 and 21 days
- Efficacy: 95% (7 d after dose 2)
 - 90% vs severe disease
- Reactions after vaccine
- No serious adverse events



Moderna

- 2 doses: 0 and 28 days
- Efficacy: 94% (7 d after dose 2)
 - 100% vs severe disease
- Reactions after vaccine
- No serious adverse events

COVID Replication-incompetent Virus Vector Vaccine Janssen/J+J

- 1 dose
- Vaccine effectiveness against deaths due to COVID-19: 100% (>14 d)
- Efficacy for hospitalization: 100% (>28 d)
- Efficacy for severe disease: 83.5% (>28 d)
- Reactions after vaccine
- No serious adverse events



Table 3: Sars-CoV-2 vaccines*

General Best Practice Guidelines for Immunization - [cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html](https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html)

Cold chain storage and handling requirements for COVID-19 vaccine products vary in temperature from refrigerated (2°C to 8°C) to frozen (-15°C to -25°C) to ultra-cold (-60°C to -80°C) in the freezer.

Vaccine	Manufacturer	Vaccine type	FDA status	FDA age indication	Dose number and interval	Presentation	Comments	Further information
mRNA162b2	Pfizer/BioNTech	mRNA	EUA 12/11/2020	16 years and older	2 doses; (0, 21 days)	multidose vials (5 doses/0.3ml per dose)	storage - 70°C; 2-8°C x 5 days	https://www.cdc.gov/mmwr/volumes/69/wr/mm6950e2.htm https://www.fda.gov/emerg-ency-preparedness-and-response/coronavirus-disease-2019-covid-19/pfizer-biontech-covid-19-vaccine
mRNA-1273	Moderna	mRNA	EUA 12/18/2020	18 years and older	2 doses; (0, 28 days)	multidose vials (10 doses/0.5ml per dose)	storage -20°C x 6 months; 2°-8°C x 30 days	https://www.cdc.gov/mmwr/volumes/69/wr/mm695152e1.htm https://www.fda.gov/advisory-committees/advisory-committee-calendar/vaccines-and-related-biological-products-advisory-committee-december-17-2020-meeting-announcement
AZD1222	U Oxford/AstraZeneca	non-replicating adenovirus vector	not submitted to FDA	N/A	2 doses (0, 28 days)	multidose vials (10 doses)	Phase 3 study complete; licensed in UK; storage 2°C-8°C x 3 months	https://clinicaltrials.gov/ct2/show/NCT04516746
Ad26COV51	Janssen/Johnson & Johnson	non-replicating adenovirus vector	EUA 2/27/21	18 years and older	1 dose	Multidose vials (5 doses/0.5 mL per dose)	2°C - 8°C x 3 months; Storage -25°C to -15°C frozen x 24 months	https://www.cdc.gov/mmwr/volumes/70/wr/mm7009e4.htm?s_cid=mm7009e4_w https://www.fda.gov/media/146338/download
NVX-CoV2373	Novavax	protein subunit	not submitted to FDA	N/A	2 doses; (0, 21 days)	N/A	Phase 3 in U.S. started 12-28-2020	https://www.clinicaltrialsregister.eu/ctr-search/trial/2020-004123-16/GB

Table Updated: 3/4/21



BLA = biologics license application, VRBPAC = Vaccines and Related Biological Products Advisory Committee, FDA = Food and Drug Administration, AAP = American Academy of Pediatrics, ACIP = Advisory Committee on Immunization Practices,

LA/IV-T = Live attenuated Influenza vaccine-trivalent, MCV4 = Meningococcal conjugate vaccine

*Information from vaccine manufacturers, from ACIP meetings and from AAP

**Changes in FDA status, or CDC/AAP recommendations in the last 2 years

***Age licensure can change following FDA review; not final until package insert approved

****ACIP recommendations do not become official until adopted by the CDC Director and Department of HHS and publication in MMWR

*have entered or completed phase 3 clinical trials



1. Text message check-ins from CDC (daily 1st week; weekly through 6 weeks; then 3, 6, and 12 mo)

Vaccine recipient completes web survey.



This Photo by Unknown Author is licensed under CC BY-SA

Vaccine recipient

v-safe
after vaccination
health checker



✓ **Received
medical care**

2. Clinically
important
event(s)
reported

Call center



3. A Vaccine Adverse Event Reporting System (VAERS) customer service representative conducts active telephone follow-up on a medically attended health impact event and takes a report if appropriate.



VAERS is the nation's early warning system for vaccine safety



VAERS

Vaccine Adverse Event Reporting System

co-managed by
CDC and FDA

<http://vaers.hhs.gov>

VAERS Vaccine Adverse Event Reporting System
www.vaers.hhs.gov

About VAERS

Report an Adverse Event

VAERS Data

Resources

Submit Follow-Up Information

Have you had a reaction following a vaccination?

1. Contact your healthcare provider.
2. [Report an Adverse Event](#) using the VAERS online form or the new downloadable PDF. **New!**

Important: If you are experiencing a medical emergency, seek immediate assistance from a healthcare provider or call 9-1-1. CDC and FDA do not provide individual medical treatment, advice, or diagnosis. If you need individual medical or health care advice, consult a qualified healthcare provider.

¿Ha tenido una reacción después de recibir una vacuna?

1. Contacte a su proveedor de salud.
2. [Reporte una reacción adversa](#) utilizando el formulario de VAERS en línea o la nueva versión PDF descargable. **Nuevo!**



What is VAERS?



REPORT AN ADVERSE EVENT

Report significant adverse events
after vaccination.



SEARCH VAERS DATA

Download VAERS Data and search
the CDC WONDER database.



REVIEW RESOURCES

Find materials, publications, learning
tools, and other resources.



SUBMIT FOLLOW-UP INFORMATION

Upload additional information related
to VAERS reports.

Vaccine Adverse Event Reporting System (VAERS)

Strengths

- National data
- Rapidly detects safety signals
- Can detect rare adverse events
- Data available to public

Limitations

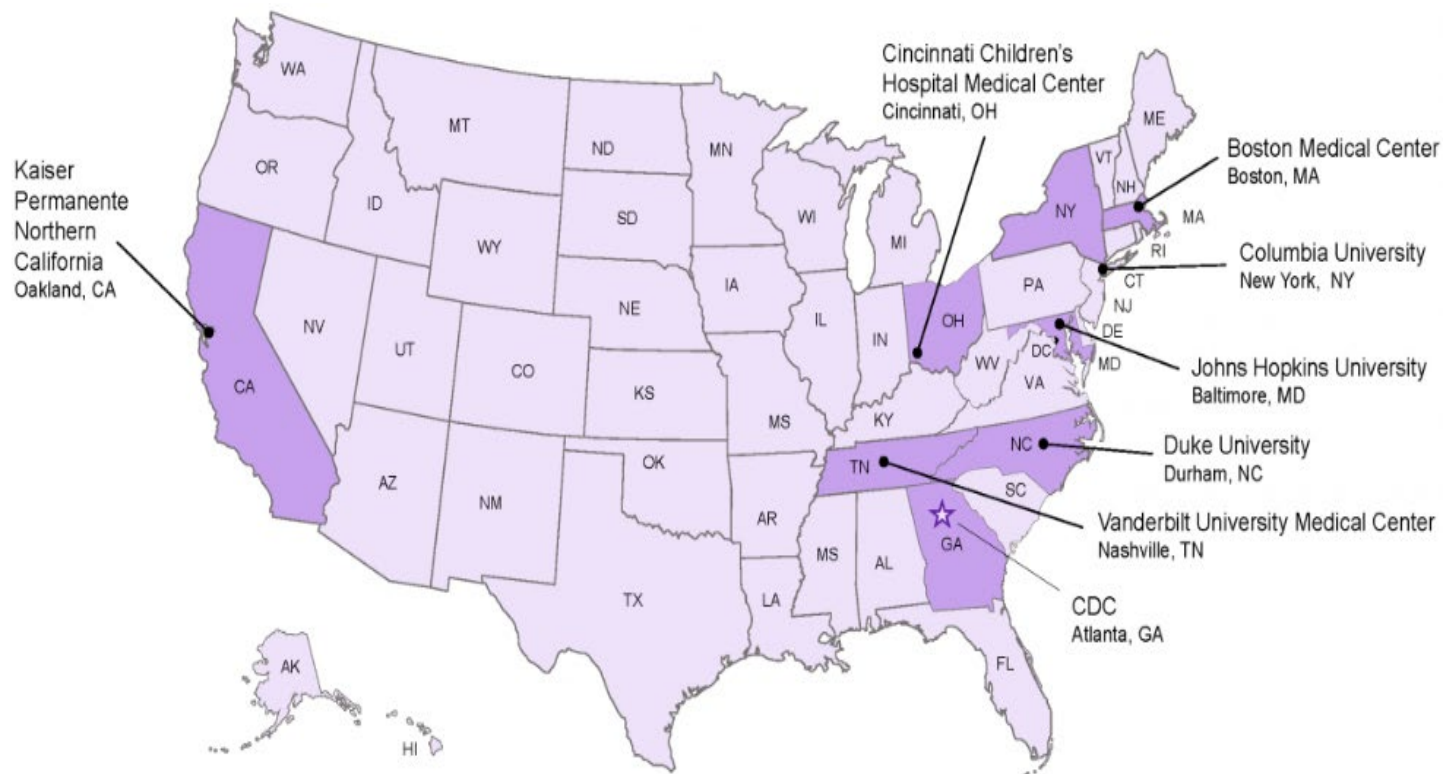
- Reporting bias
- Inconsistent data quality and completeness of information
- Lack of unvaccinated comparison group
- Not designed to assess causality

- **VAERS accepts all reports from everyone** regardless of the plausibility of the vaccine causing the event or the clinical seriousness of the event.
- As a hypothesis generating system, VAERS identifies potential vaccine safety concerns that can be studied in more robust data systems.



CISA

Clinical Immunization Safety Assessment (CISA) Project



7 participating medical
research centers with
vaccine safety experts

- **clinical consult services[†]**
- **clinical research**

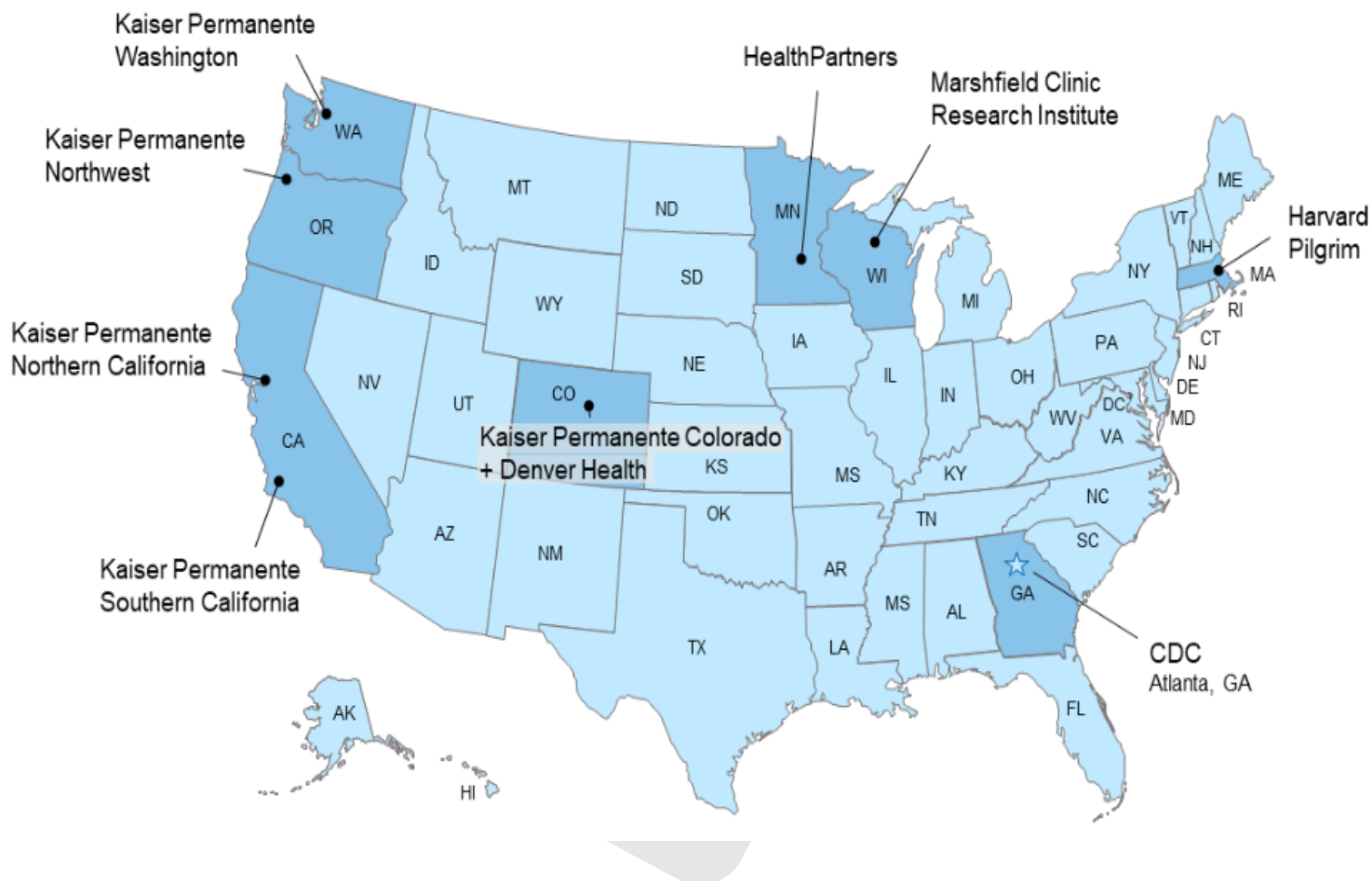
[†]More information about clinical consults available at
<http://www.cdc.gov/vaccinesafety/Activities/CISA.html>



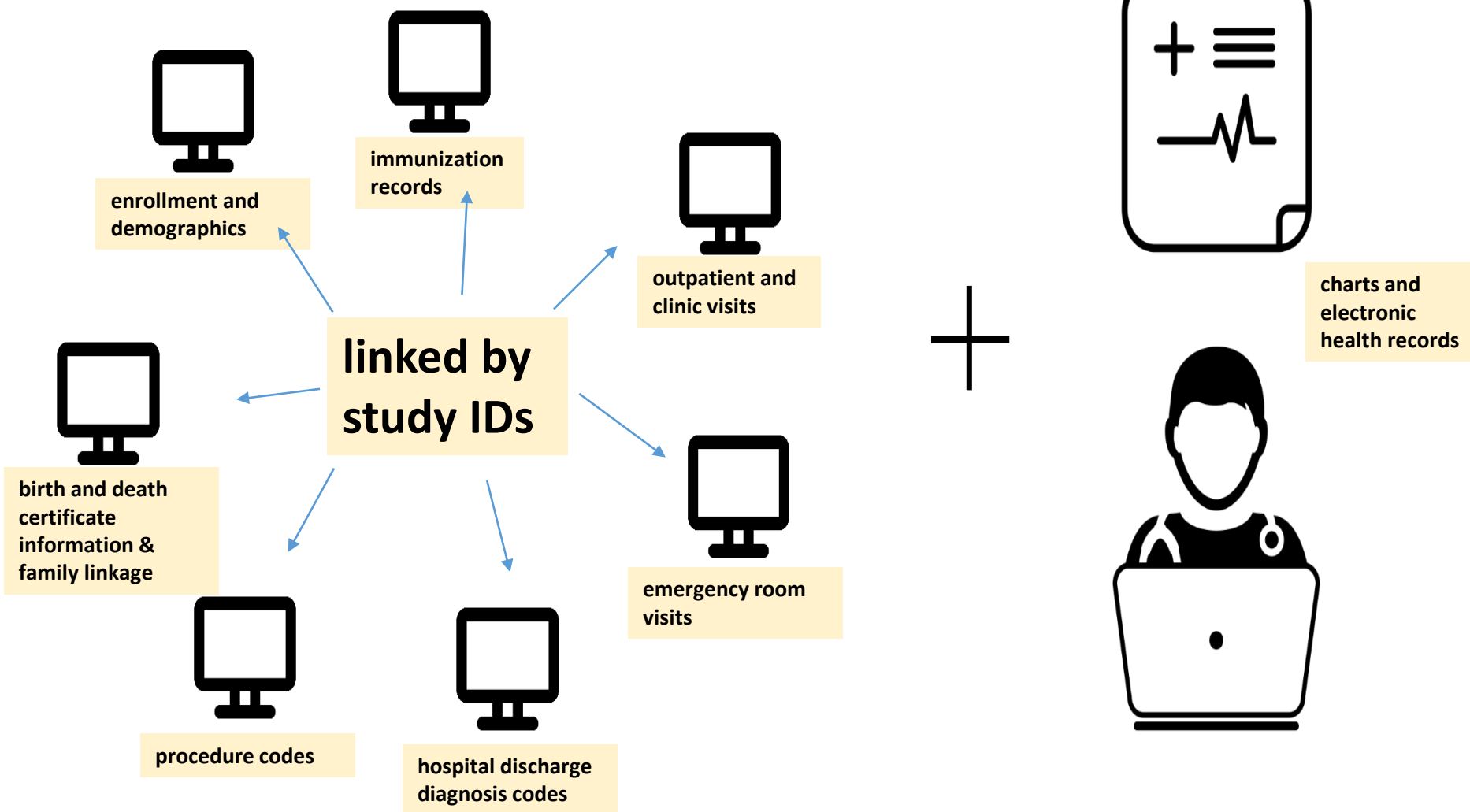
VSD

Vaccine Safety Datalink

9 participating
integrated
healthcare
organizations data
on over **12 million**
persons per year



Types of information in VSD



REPORT OF THE COMMITTEE
ON
IMMUNIZATION PROCEDURES
OF THE
AMERICAN ACADEMY
OF PEDIATRICS

•

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January, 1938

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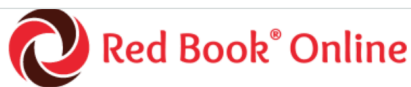
**RED
BOOK®**

2021–2024
Report of the Committee
on Infectious Diseases

32nd Edition

American Academy of Pediatrics
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Red Book® Report of the Committee on Infectious Diseases

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① Resources Tour

VIDEO: Watch a guided tour of the resources available on Red Book Online



Are you an AAP
member?



Immunization Schedules

Recommended immunization schedules and catch-up schedules for infants, children, adolescents, and young adults.



Visual Library

More than 2,500 infectious disease images for use in diagnosis and presentations, including clinical manifestations, disease vectors, and etiology



Vaccine Status Table

Current information about recently submitted, licensed, and recommended vaccines and biologics, including status of the FDA licensure process and related AAP/CDC recommendations.



Influenza Resources

A comprehensive list of influenza resources for vaccine guidance, prevention, treatment, payment, policies, news, and other information pertaining to influenza for infants, children, adolescents, and young adults.

AAP News articles on COVID-19

- [AAP: Limit visitors to hospitalized children during COVID-19 pandemic 7/1/20](#)
- [AAP updates child care guidance on sanitizing spaces, screening staff 6/29/20](#)
- [AAP interim guidance on school re-entry focuses on mitigating COVID-19 risks 6/26/20](#)
- [More](#)

CDC Webinar - Acute Flaccid Myelitis: What Healthcare Providers Need to Know in 2020

Table 1: Status of Recently Submitted, Licensed, and Recommended Vaccines & Biologics**

Click on disease names for current Red Book® recommendations. General Best Practice Guidelines for Immunization - cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html
Vaccine supply shortages may result in changes to recommendations. Please consult cdc.gov/vaccines/vac-gen/shortages/default.htm

Vaccines	Abbreviation (Brand Name)	Manufacturer	FDA licensure	FDA age indications***	CDC/AAP recommendation	Further Information****
Dengue	N/A (Dengvaxia®)	Sanofi	May 2019	9 through 16 years of age who have serologic evidence of prior infection	Pending	https://www.cdc.gov/dengue/prevention/dengue-vaccine.html
DTaP/IPV/Hep B/Hib	DTaP/IPV/Hep B/Hib (Vaxelis®)	Sanofi-Merck	December 2018	6 weeks through 4 years of age	Pending	Vaccine not available until 2021
Ebola	N/A (Ervebo®)	Merck	December 2019	18 years and older	Pending	https://www.cdc.gov/vhf/ebola/prevention/index.html
Hepatitis A	HepA (Havrix®; VAXTA®)	GSK; Merck	n/a	12 months of age and older	a) Routine catch up vaccination for all children 1 through 18 years of age b) HIV infection and homelessness are indications for vaccination for all persons 1 year of age and older	https://www.cdc.gov/mmwr/volumes/69/rr/rr6905a1.htm
Human Papillomavirus	HPV (Gardasil®)	Merck	October 2018	27 years through 45 years of age	a) Routine immunization of both men and women through age 26 years. b) Immunization of adults 27 through 45 years of age based on shared clinical decision making.	CDC: https://www.cdc.gov/mmwr/volumes/68/wr/mm6832a3.htm
Influenza		several	varies	See Influenza Vaccine Table		See Influenza Vaccine Table
Japanese Encephalitis	N/A (Ixiaro®)	Valneva Austria GmbH	October 2018 (accelerated schedule) and April 2018 (pediatric booster dose)	2 months of age and older	a) Adults 18 years of age and older: accelerated primary series with dose #2 7-28 days after dose #1 b) Adults and children 2 months of age and older: Booster dose should be given 1 year or more after completion of the primary series if ongoing exposure	CDC: https://www.cdc.gov/mmwr/volumes/68/rr/rr6802a1.htm
Meningococcal ACWY	MenACWY-TT (Menquadfi)	Sanofi Pasteur	April 23, 2020	2 years of age and older	a) Routine vaccination for adolescents aged 11 or 12 years, with a booster dose at age 16 years. b) Routine vaccination for persons aged ≥2 years at increased risk for meningococcal disease caused by serogroups A, C, W, or Y	https://www.cdc.gov/mmwr/volumes/69/rr/rr6909a1.htm
Meningococcal Group B	MenB-FHbp (Trumenba®); Men B-4C (Bexero®)	Pfizer/Wyeth; GSK	April 2016; Jan 2015	10 years through 25 years of age	a) MenB series for adolescents and young adults aged 16–23 years on the basis of shared clinical decision-making b) Routine use among persons aged ≥10 years who are at increased risk for serogroup B meningococcal disease c) Booster dose 1 year after primary series for those at high risk (includes individuals in outbreak settings)	https://www.cdc.gov/mmwr/volumes/69/rr/rr6909a1.htm
PCV13	PCV13 (Prevnar 13®)	Wyeth	n/a	6 weeks of age and older	Immunization of adults 65 years of age and older based on shared decision making rather than routine	https://www.cdc.gov/mmwr/volumes/68/wr/mm6846a5.htm
Tdap	Tdap (Adacel®)	Sanofi Pasteur	Jan 2019	10 through 64 years of age, booster dose ≥ 8 years after prior dose	Tdap may now be substituted for Td for the decennial tetanus-diphtheria booster, for wound prophylaxis, and for catch-up immunization.	CDC: https://www.cdc.gov/mmwr/volumes/69/wr/mm6903a5.htm

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