



Immunization Update 2019

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Disclosures

- **The speaker is a federal government employee with no financial interest in or conflict with the manufacturer of any product named in this presentation**
- **The speaker will not discuss a vaccine not currently licensed by the FDA**
- **The speaker will discuss the off-label use of hepatitis A vaccine**

Disclosures

- The recommendations to be discussed are primarily those of the Advisory Committee on Immunization Practices (ACIP):
 - Composed of 15 nongovernment experts in clinical medicine and public health
 - Provides guidance on use of vaccines and other biologic products to DHHS, CDC, and the U.S. Public Health Service
- Watch the live webcast
 - <https://www.cdc.gov/vaccines/acip/meetings/webcast-instructions.html>

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ACIP Home

ACIP

The Advisory Committee on Immunization Practices (ACIP) is a group of medical and public health experts that develop recommendations on use of vaccines in the civilian population of the United States.

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Register for upcoming June ACIP meeting

June 21-22, 2017

Deadline for registration:

Non-US Citizens: May 22, 2017, 5:00pm ET (No exceptions)

US Citizens: June 7, 2017, 5:00pm ET

Registration is NOT required to watch the live meeting webcast or to listen via telephone.

Public Comment Instructions (1 page)

ACIP Meetings

- Meeting Information Recent ACIP meeting agendas, detailed meeting minutes, live meetings, and presentation slides.
- Upcoming Meetings List of scheduled ACIP meeting dates.
- Register for a Meeting Next meeting's registration details including deadline, driving directions and hotel choices.

Immunization Schedules

View current schedules for children, teens, and adults.

ACIP Recommendations

- Recommendations
- Complete list of ACIP recommendations published in the MMWR.
- Immunization Schedules
- Links to the childhood, adolescent, catch-up, and adult immunization schedules; plus vaccine recording

**Next ACIP meeting
June 2019**

Overview

- Vaccination coverage rates
- Vaccine Product Updates
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Vaccination Rates

Vaccine Products Updates

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FDA News Release

FDA approves expanded use of Gardasil 9 to include individuals 27 through 45 years old

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For Immediate Release

October 5, 2018

Release

[Español](#)

The U.S. Food and Drug Administration today approved a supplemental application for Gardasil 9 (Human Papillomavirus (HPV) 9-valent Vaccine, Recombinant) expanding the approved use of the vaccine to include women and men aged 27 through 45 years. Gardasil 9 prevents certain cancers and diseases caused by the nine HPV types covered by the vaccine.

Inquiries

Media

[✉ Megan McSeveney](#)
[☎ 240-402-4514](#)

Consumers

[☎ 888-INFO-FDA](#)

Related Information

- [HPV \(human papillomavirus\)](#)
- [Gardasil 9](#)
- [Gardasil](#)
- [FDA Sentinel study finds no association between venous thromboembolism and Gardasil](#)

Product Update: HPV

- Since the introduction of the HPV vaccines (4- and 9-types), there has been a significant decrease in the covered strains infection rates
- Prevalence of these same types have also decreased in women who were not vaccinated
 - Prevalence of vaccine types decreased by 40 percent in women who were not vaccinated—implying a herd immunity

Human Papillomavirus Vaccine Effectiveness and Herd Protection in Young Women

Chelse Spinner,^a Lili Ding,^{b,c} David I. Bernstein,^{b,c} Darron R. Brown,^d Eduardo L. Franco,^e Courtney Covert,^f Jessica A. Kahn, MD, MPH^{b,c}

abstract

BACKGROUND: Clinical trials of the 4-valent human papillomavirus (HPV) vaccine demonstrate high efficacy, but surveillance studies are essential to examine the long-term impact of vaccine introduction on HPV prevalence in community settings. The aims of this study were to determine during the 11 years after vaccine introduction the prevalence of (1) vaccine-type HPV in adolescent and young adult women who were vaccinated (to assess vaccine effectiveness) and (2) vaccine-type HPV in women who were unvaccinated (to assess herd protection).

METHODS: Young women 13 to 26 years of age were recruited from hospital-based and community health clinics for 4 surveillance studies from 2006 to 2017. We determined the proportion of vaccinated and unvaccinated women who were positive for vaccine-type HPV across the studies, and the odds of positivity for vaccine-type HPV using logistic regression; all analyses were propensity score–adjusted to control for between-wave differences in participant characteristics.

RESULTS: Vaccination rates increased from 0% to 84.3% (97% of study participants received the 4-valent vaccine). Among women who were vaccinated, 4-valent vaccine–type HPV detection decreased from 35% to 6.7% (80.9% decline; odds ratio 0.13, 95% confidence interval 0.08 to 0.22). Among women who were unvaccinated, 4-valent vaccine–type HPV detection decreased from 32.4% to 19.4% (40% decline; odds ratio 0.50, 95% confidence interval 0.26 to 0.97). Estimated vaccine effectiveness was 90.6% in wave 3 and 80.1% in wave 4.

CONCLUSIONS: In this study in which trends in HPV in a US community >10 years after 4-valent HPV vaccine introduction and after 9-valent vaccine introduction were examined, we found evidence of vaccine effectiveness and herd protection. Further research is needed to examine trends in 9-valent vaccine–type HPV after higher rates of vaccination are achieved.



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Ms Spinner assisted with the design of the analyses, did the literature search, interpreted the results, and codrafted the initial manuscript; Dr Ding designed and conducted the statistical analyses, interpreted the results, and critically revised the manuscript for intellectual content; Drs Bernstein and Franco assisted with study conceptualization and design, interpreted the results, and critically revised the manuscript for intellectual content; Dr Brown assisted with study conceptualization and design, conducted the human papillomavirus DNA analyses, interpreted the results, and critically revised the manuscript for intellectual content; Ms Covert recruited participants for the study and interpreted the results; Dr Kahn conceptualized and designed the study, obtained funding for the study, interpreted the results, codrafted the initial

WHAT'S KNOWN ON THIS SUBJECT: Researchers in clinical trials of the 4-valent human papillomavirus (HPV) vaccine demonstrate high efficacy, but surveillance studies are essential to examine the long-term impact of vaccine introduction on HPV prevalence in community settings.

WHAT THIS STUDY ADDS: In this study in which trends in HPV in a US community >10 years after 4-valent HPV vaccine introduction and after 9-valent vaccine introduction are examined, we found evidence of vaccine effectiveness and herd protection.

Pediatric Vaccine Supply: Recombivax HB

- Merck anticipates having a limited supply of pediatric monovalent hepatitis B vaccine through 2019
- GSK can address the gap in pediatric hepatitis B vaccine using a mix of single-component hepatitis B vaccine and DTaP-HepB-IPV (Pediarix)

Pediatric Hepatitis B Vaccination Guidance during the 2018 Supply Shortage

Merck's supply of pediatric hepatitis B vaccine (Recombivax HB[®]) will continue to be limited for the remainder of 2018 due to a manufacturing issue. To supplement current vaccine availability, GSK will continue to make an increased amount of pediatric hepatitis B-containing vaccine available, including both single-component vaccine (Engerix-B[®]) and combination vaccine (Pediarix[®]).

This increase is sufficient to address the gap in supply related to Merck's manufacturing issue so that infants and young children can continue to receive their recommended hepatitis B vaccine series on time. Importantly, sufficient single-component hepatitis B vaccine will be available to ensure that all infants and young children receive their recommended hepatitis B vaccine series on time.

CDC has provided general guidance for giving vaccine during this time.

Pediatric hepatitis B vaccine general recommendations for hepatitis B

The recommendations for hepatitis B

Providers should continue with the recommended ACIP hepatitis B vaccine recommendations.

- Only single-component hepatitis B vaccine should be given at the birth dose.
- During this time, providers should continue to use the ACIP hepatitis B vaccine recommendations for infants whose mothers are hepatitis B surface antigen (HBsAg) negative.
- Administer single-component hepatitis B vaccine to infants:
 - Weighing 2,000 grams (4 pounds, 6.5 ounces) or more at birth
 - Weighing less than 2,000 grams (4 pounds, 6.5 ounces) at birth
- The third HepB dose can be administered at 12–15 months of age.
- In populations with high rates of hepatitis B, such as families from Asia, Africa, and the Pacific Islands, HepB vaccine should be administered at 12–15 months of age.

For infants whose mothers are HBsAg negative

- Administer single-component hepatitis B vaccine at birth and two additional doses at 2, 4, and 6 months of age.
- For infants weighing less than 2,000 grams (4 pounds, 6.5 ounces) at birth, vaccine given at birth should NOT be counted as part of the vaccine series. Three additional doses (for a total of 4 doses) should be administered beginning when the infant reaches 1 month of age. Complete the series within 6 months.

For considerations of serology testing prior to vaccination in infants 12–15 months of age, see [the HepB or Younger²](#).

For additional information, see the [Recombinant Hepatitis B Vaccine \(Recombivax HB\) Product Information](#).

¹ ACIP hepatitis B vaccine recommendations: <https://www.cdc.gov/mmwr/volumes/67/wr/mm6701a1.htm>

² Recommended Immunization Schedule for Children 12–15 Months of Age or Younger can be found at: <https://www.cdc.gov/vaccines/schedule/combined-schedule.pdf>.

These sample immunization schedules apply to infants born to hepatitis B surface antigen-negative mothers

- Using Pediarix for all doses after the birth dose

Birth ¹	2 months	4 months	6 months ²	12–15 months	15–18 months
HepB	Pediarix DTaP-HepB-IPV	Pediarix DTaP-HepB-IPV	Pediarix DTaP-HepB-IPV		DTaP ³
	Hib	Hib	Hib ⁴	Hib	

- Using Pediarix and single-component DTaP and IPV

Birth ¹	2 months	4 months	6 months ²	12–15 months	15–18 months
HepB	Pediarix DTaP-HepB-IPV	DTaP IPV	Pediarix DTaP-HepB-IPV		DTaP ³
		Hib	Hib ⁴	Hib	

- Using Pentacel[®] and single-component HepB vaccine

Birth ¹	2 months	4 months	6 months ²	12–15 months	15–18 months
HepB	HepB			HepB	
	Pentacel DTaP-IPV/Hib	Pentacel DTaP-IPV/Hib	Pentacel DTaP-IPV/Hib		DTaP ³
				Hib	

- Completing the hepatitis B series using all single-component vaccines

Birth ¹	2 months	4 months	6 months ²	12–15 months	15–18 months
HepB	HepB			HepB	
	DTaP	DTaP	DTaP		DTaP ³
	IPV	IPV	IPV		
	Hib	Hib	Hib ⁴	Hib	

¹For infants weighing less than 2,000 grams (4 pounds, 6.5 ounces) at birth, vaccine given at birth should NOT be counted as part of the vaccine series. Three additional doses (for a total of 4 doses) should be administered beginning when the infant reaches 1 month of age. Complete the series within 6 months.

²For infants weighing 2,000 grams (4 pounds, 6.5 ounces) or more at birth, vaccine given at birth DOES count as part of the vaccine series. Two additional doses (for a total of 3 doses) should be administered. A series that includes 4 doses is acceptable, but not required. Complete the series within 6 months.

³The 4th dose of DTaP may be administered as early as age 12 months, provided at least 6 months have elapsed since the 3rd dose.

⁴If using PedvaxHIB a dose at 6 months is not needed.

CDC Current Vaccine Shortages and Delays www.cdc.gov/vaccines/hcp/clinical-resources/shortages.html, Accessed 03/21/2019

Clinical job aid: Pediatric Hepatitis B Vaccination Guidance during the 2018 Supply Shortage www.cdc.gov/vaccines/hcp/clinical-resources/downloads/2018-Pediatric-Hepatitis-B-Vaccine-Supply-Update-and-Guidance-Table.pdf

Adult Vaccine Supply: Recombivax HB

- Merck is not currently distributing its adult hepatitis B vaccine and does not expect to be distributing adult hepatitis B vaccine throughout 2019
- GSK has sufficient supplies of adult hepatitis B vaccines to address the anticipated gap in Merck's supply of adult hepatitis B vaccine during this period
- In addition, Dynavax makes an adult hepatitis B vaccine (Heplisav-B) that is available for use

Adult Vaccine Supply: Shingrix

- Due to high levels of demand for GSK's Shingrix vaccine, GSK has implemented order limits and providers have experienced shipping delays
- Order limits and shipping delays will continue throughout 2019
- GSK has increased the U.S. supply available and plans to release more doses on a consistent and reliable basis in 2019

ACIP Immunization Schedule Updates

2019 Immunization Schedules

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

UNITED STATES
2019

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	HepA	Havrix Vaqta
Hepatitis B vaccine	HepB	Engerix-B Recombivax HB
Human papillomavirus vaccine	HPV	Gardasil 9
Influenza vaccine (inactivated)	IIV	Multiple
Influenza vaccine (live, attenuated)	LAIV	FluMist
Measles, mumps, and rubella vaccine	MMR	M-M-R II
Meningococcal serogroups A, C, W, Y vaccine	MenACWY-D MenACWY-CRM	Menactra Menveo
Meningococcal serogroup B vaccine	MenB-4C MenB-FHbp	Bexsero Trumenba
Pneumococcal 13-valent conjugate vaccine	PCV13	Prevnar 13
Pneumococcal 23-valent polysaccharide vaccine	PPSV23	Pneumovax
Poliovirus vaccine (inactivated)	IPV	IPOl
Rotavirus vaccine	RV1 RV5	Rotarix RotaTeq
Tetanus, diphtheria, and acellular pertussis vaccine	Tdap	Adacel Boostrix
Tetanus and diphtheria vaccine	Td	Tenivac Td vaccine
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 Quadacel
Measles, mumps, rubella, and varicella vaccines	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 ACIP 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), and American College of Obstetricians and Gynecologists (www.acog.org).

Report

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



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

Table 1 Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger
United States, 2019

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 in Table 1. 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		← 3 rd 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							
Haemophilus influenzae 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)	Annual vaccination 1 or 2 doses										Annual vaccination 1 dose only						
Influenza (LAIV)	Annual vaccination 1 or 2 doses										Annual vaccination 1 dose only						
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	2-dose series, See Notes											
Meningococcal (MenACWY-D ≥9 mos; MenACWY-CRM ≥2 mos)			See Notes											1 st dose		2 nd dose	
Tetanus, diphtheria, & acellular pertussis (Tdap: ≥7 yrs)															Tdap		
Human papillomavirus (HPV)															See Notes		
Meningococcal B															See Notes		
Pneumococcal polysaccharide (PPSV23)												See Notes					

 Range of recommended ages for all children
 Range of recommended ages for catch-up immunization
 Range of recommended ages for certain high-risk groups
 Range of recommended ages for non-high-risk groups that may receive vaccine, subject to individual clinical decision-making
 No recommendation

Table 2 Catch-up immunization schedule for persons aged 4 months–18 years who start late or who are more than 1 month behind, United States, 2019

The figure below provides catch-up schedules and minimum intervals between doses for children whose vaccinations have been delayed. A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Use the section appropriate for the child's age. Always use this table in conjunction with 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 <i>and</i> 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
<i>Haemophilus influenzae</i> 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 <i>and</i> first dose was administered at younger than age 7 months, <i>and</i> 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 <i>and</i> first dose was administered at age 7 through 11 months; OR if current age is 12 through 59 months <i>and</i> first dose was administered before the 1 st birthday, <i>and</i> second dose administered at younger than 15 months; OR if both doses were PRP-OMP (PedvaxHIB; Comvax) <i>and</i> 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 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 administered at age 24 months or older. 4 weeks if current age is younger than 12 months and previous dose given at <7 months old. 8 weeks (as final dose for healthy children) if previous dose given between 7-11 months (wait until at least 12 months old); OR if current age is 12 months or older and at least 1 dose was given before age 12 months.	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	2 months MenACWY-CRM 9 months MenACWY-D	8 weeks	See Notes	See Notes	
Children and adolescents age 7 through 18 years					
Meningococcal	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 <i>and</i> 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, 2019**

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

■ 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.
 ■ Contraindicated or use not recommended—vaccine should not be administered because of risk for serious adverse reaction
 ■ Precaution—vaccine might be indicated if benefit of protection outweighs risk of adverse reaction
 ■ Delay vaccination until after pregnancy if vaccine indicated
 ■ No recommendation

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

² Severe Combined Immunodeficiency

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

Recommended Adult Immunization Schedule for ages 19 years or older

UNITED STATES
2019

How to use the adult immunization schedule

- 1 Determine recommended vaccinations by age (**Table 1**)
- 2 Assess need for additional recommended vaccinations by medical condition and other indications (**Table 2**)
- 3 Review vaccine types, frequencies, and 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 College of Physicians (www.acponline.org), Academy of Family Physicians (www.aafp.org), American College of Obstetricians and Gynecologists (www.acog.org), and American College of Nurse-Midwives (www.midwife.org).

Vaccines in the Adult Immunization Schedule*

Vaccines	Abbreviations	Trade names
<i>Haemophilus influenzae</i> type b vaccine	Hib	ActHIB Hiberix
Hepatitis A vaccine	HepA	Havrix Vaqta
Hepatitis A and hepatitis B vaccine	HepA-HepB	Twinrix
Hepatitis B vaccine	HepB	Engerix-B Recombivax HB Heplisav-B
Human papillomavirus vaccine	HPV vaccine	Gardasil 9
Influenza vaccine, inactivated	IIV	Many brands
Influenza vaccine, live attenuated	LAIV	FluMist Quadrivalent
Influenza vaccine, recombinant	RIV	Flublok Quadrivalent
Measles, mumps, and rubella vaccine	MMR	M-M-R II
Meningococcal serogroups A, C, W, Y vaccine	MenACWY	Menactra Menveo
Meningococcal serogroup B vaccine	MenB-4C MenB-FHbp	Bexsero Trumenba
Pneumococcal 13-valent conjugate vaccine	PCV13	Prevnar 13
Pneumococcal 23-valent polysaccharide vaccine	PPSV23	Pneumovax
Tetanus and diphtheria toxoids	Td	Tenivac Td vaccine
Tetanus and diphtheria toxoids and acellular pertussis vaccine	Tdap	Adacel Boostrix
Varicella vaccine	VAR	Varivax
Zoster vaccine, recombinant	RZV	Shingrix
Zoster vaccine live	ZVL	Zostavax

*Administer recommended vaccines if vaccination history is incomplete or unknown. Do not restart or add doses to vaccine series for extended intervals between doses. The use of trade names is for identification purposes only and does not imply endorsement by the ACIP or CDC.

Report

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

Injury claims

All vaccines included in the adult immunization schedule except pneumococcal 23-valent polysaccharide and zoster vaccines are covered by the Vaccine Injury Compensation Program. Information on how to file a vaccine injury claim is available at www.hrsa.gov/vaccinecompensation or 800-338-2382.

Questions or comments

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



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

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
- Vaccine Information Statements: www.cdc.gov/vaccines/hcp/vis/index.html
- Manual for the Surveillance of Vaccine-Preventable Diseases (including case identification and outbreak response): www.cdc.gov/vaccines/pubs/surv-manual
- Travel vaccine recommendations: www.cdc.gov/travel
- Recommended Child and Adolescent Immunization Schedule, United States, 2019: www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html



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

Table 1 Recommended Adult Immunization Schedule by Age Group
United States, 2019

Vaccine	19–21 years	22–26 years	27–49 years	50–64 years	≥65 years
Influenza inactivated (IIV) or Influenza recombinant (RIV) ^{or} Influenza live attenuated (LAIV)	1 dose annually ^{or} 1 dose annually				
Tetanus, diphtheria, pertussis (Tdap or Td)	1 dose Tdap, then Td booster every 10 yrs				
Measles, mumps, rubella (MMR)	1 or 2 doses depending on indication (if born in 1957 or later)				
Varicella (VAR)	2 doses (if born in 1980 or later)				
Zoster recombinant (RZV) (preferred) ^{or} Zoster live (ZVL)	2 doses ^{or} 1 dose				
Human papillomavirus (HPV) Female	2 or 3 doses depending on age at initial vaccination				
Human papillomavirus (HPV) Male	2 or 3 doses depending on age at initial vaccination				
Pneumococcal conjugate (PCV13)	1 dose				
Pneumococcal polysaccharide (PPSV23)	1 or 2 doses depending on indication				
Hepatitis A (HepA)	2 or 3 doses depending on vaccine				
Hepatitis B (HepB)	2 or 3 doses depending on vaccine				
Meningococcal A, C, W, Y (MenACWY)	1 or 2 doses depending on indication, then booster every 5 yrs if risk remains				
Meningococcal B (MenB)	2 or 3 doses depending on vaccine and indication				
Haemophilus influenzae type b (Hib)	1 or 3 doses depending on indication				

Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection
 Recommended vaccination for adults with an additional risk factor or another indication
 No recommendation

Table 2 Recommended Adult Immunization Schedule by Medical Condition and Other Indications
United States, 2019

Vaccine	Pregnancy	Immuno-compromised (excluding HIV infection)	HIV infection CD4 count		Asplenia, complement deficiencies	End-stage renal disease, on hemodialysis	Heart or lung disease, alcoholism ¹	Chronic liver disease	Diabetes	Health care personnel ²	Men who have sex with men	
			<200	≥200								
IIV or RIV or LAIV	1 dose annually											
	CONTRAINDICATED					PRECAUTION				1 dose annually		
Tdap or Td	1 dose Tdap each pregnancy	1 dose Tdap, then Td booster every 10 yrs										
MMR	CONTRAINDICATED			1 or 2 doses depending on indication								
VAR	CONTRAINDICATED			2 doses								
RZV (preferred) or ZVL	DELAY				2 doses at age ≥50 yrs							
	CONTRAINDICATED				1 dose at age ≥60 yrs							
HPV Female	DELAY	3 doses through age 26 yrs			2 or 3 doses through age 26 yrs							
HPV Male		3 doses through age 26 yrs			2 or 3 doses through age 21 yrs						2 or 3 doses through age 26 yrs	
PCV13		1 dose										
PPSV23		1, 2, or 3 doses depending on age and indication										
HepA		2 or 3 doses depending on vaccine										
HepB										2 or 3 doses depending on vaccine		
MenACWY		1 or 2 doses depending on indication, then booster every 5 yrs if risk remains										
MenB	PRECAUTION	2 or 3 doses depending on vaccine and indication										
Hib		3 doses HSCT ³ recipients only		1 dose								

 Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection
 Recommended vaccination for adults with an additional risk factor or another indication
 Precaution—vaccine might be indicated if benefit of protection outweighs risk of adverse reaction
 Delay vaccination until after pregnancy if vaccine is indicated
 Contraindicated—vaccine should not be administered because of risk for serious adverse reaction
 No recommendation

1. Precaution for LAIV does not apply to alcoholism. 2. See notes for influenza; hepatitis B; measles, mumps, and rubella; and varicella vaccinations. 3. Hematopoietic stem cell transplant.
02/19/19 Centers for Disease Control and Prevention | Recommended Adult Immunization Schedule, United States, 2019 | Page 3

Haemophilus influenzae type b vaccination**Special situations**

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

Hepatitis A vaccination**Routine vaccination**

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

Special situations

- **At risk for hepatitis A virus infection:** 2-dose series HepA or 3-dose series HepA-HepB as above
 - **Chronic liver disease**
 - **Clotting factor disorders**
 - **Men who have sex with men**
 - **Injection or non-injection drug use**
 - **Homelessness**
 - **Work with hepatitis A virus** in research laboratory or nonhuman primates with hepatitis A virus infection
 - **Travel in countries with high or intermediate endemic hepatitis A**
 - **Close personal contact with international adoptee** (e.g., household, regular babysitting) in first 60 days after arrival from country with high or intermediate endemic hepatitis A (administer dose 1 as soon as adoption is planned, at least 2 weeks before adoptee's arrival)

Hepatitis B vaccination**Routine vaccination**

- **Not at risk but want protection from hepatitis B** (identification of risk factor not required): 2- or 3-dose series HepB (2-dose series Hepsiv-B at least 4 weeks apart [2-dose series HepB only applies when 2 doses of Hepsiv-B are used at least 4 weeks apart] or 3-dose series Engerix-B or Recombivax HB at 0, 1, 6 months [minimum intervals: 4 weeks between doses 1 and 2, 8 weeks between doses 2 and 3, 16 weeks between doses 1 and 3]) or 3-dose series HepA-HepB (Twinrix at 0, 1, 6 months [minimum intervals: 4 weeks between doses 1 and 2, 5 months between doses 2 and 3])

Special situations

- **At risk for hepatitis B virus infection:** 2-dose (Hepsiv-B) or 3-dose (Engerix-B, Recombivax HB) series HepB, or 3-dose series HepA-HepB as above
 - **Hepatitis C virus infection**
 - **Chronic liver disease** (e.g., cirrhosis, fatty liver disease, alcoholic liver disease, autoimmune hepatitis, alanine aminotransferase [ALT] or aspartate aminotransferase [AST] level greater than twice upper limit of normal)
 - **HIV infection**
 - **Sexual exposure risk** (e.g., sex partners of hepatitis B surface antigen (HBsAg)-positive persons; sexually active persons not in mutually monogamous relationships, persons seeking evaluation or treatment for a sexually transmitted infection, men who have sex with men)
 - **Current or recent injection drug use**
 - **Percutaneous or mucosal risk for exposure to blood** (e.g., household contacts of HBsAg-positive persons; residents and staff of facilities for developmentally disabled persons; health care and public safety personnel with reasonably anticipated risk for exposure to blood or blood-contaminated body fluids; hemodialysis, peritoneal dialysis, home dialysis, and predialysis patients; persons with diabetes mellitus age younger than 60 years and, at discretion of treating clinician, those age 60 years or older)
 - **Incarcerated persons**
 - **Travel in countries with high or intermediate endemic hepatitis B**

Human papillomavirus vaccination**Routine vaccination**

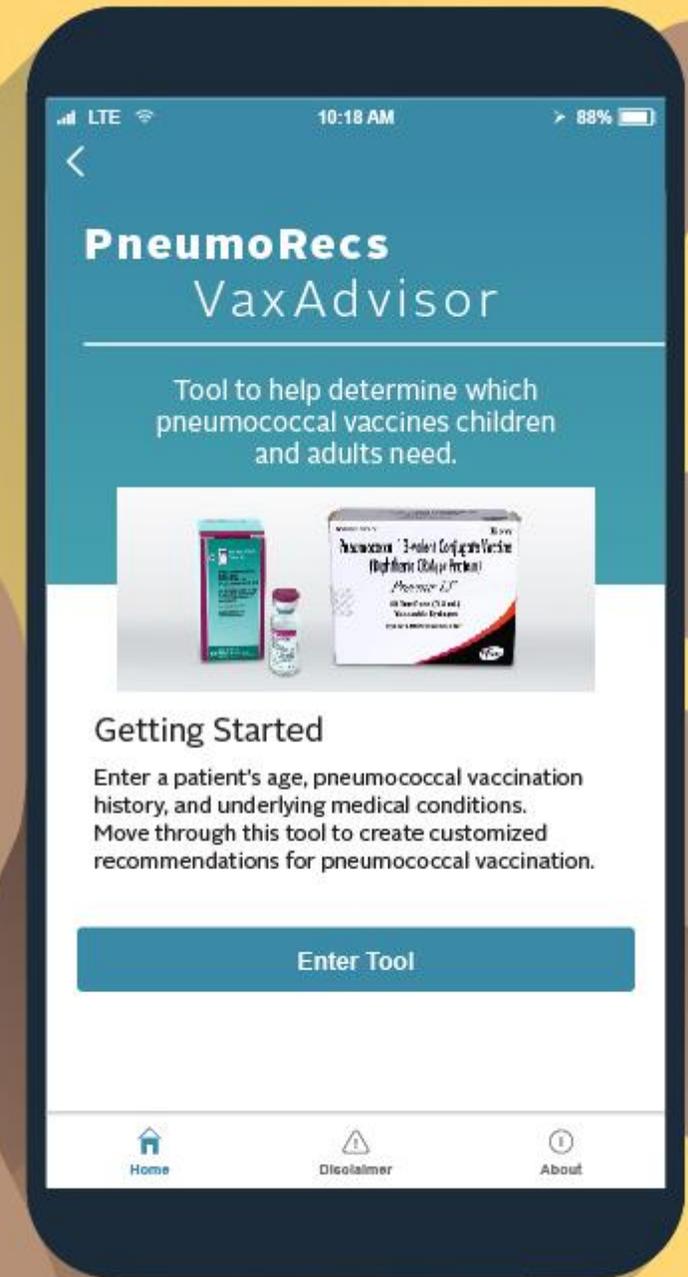
- **Females through age 26 years and males through age 21 years:** 2- or 3-dose series HPV vaccine depending on age at initial vaccination; males age 22 through 26 years may be vaccinated based on individual clinical decision (HPV vaccination routinely recommended at age 11–12 years)
- **Age 15 years or older at initial vaccination:** 3-dose series HPV vaccine at 0, 1–2, 6 months (minimum intervals: 4 weeks between doses 1 and 2, 12 weeks between doses 2 and 3, 5 months between doses 1 and 3; repeat dose if administered too soon)
- **Age 9 through 14 years at initial vaccination and received 1 dose, or 2 doses less than 5 months apart:** 1 dose HPV vaccine
- **Age 9 through 14 years at initial vaccination and received 2 doses at least 5 months apart:** HPV vaccination complete, no additional dose needed
- If completed valid vaccination series with any HPV vaccine, no additional doses needed

Special situations

- **Immunocompromising conditions (including HIV infection) through age 26 years:** 3-dose series HPV vaccine at 0, 1–2, 6 months as above
- **Men who have sex with men and transgender persons through age 26 years:** 2- or 3-dose series HPV vaccine depending on age at initial vaccination as above
- **Pregnancy through age 26 years:** HPV vaccination not recommended until after pregnancy; no intervention needed if vaccinated while pregnant; pregnancy testing not needed before vaccination

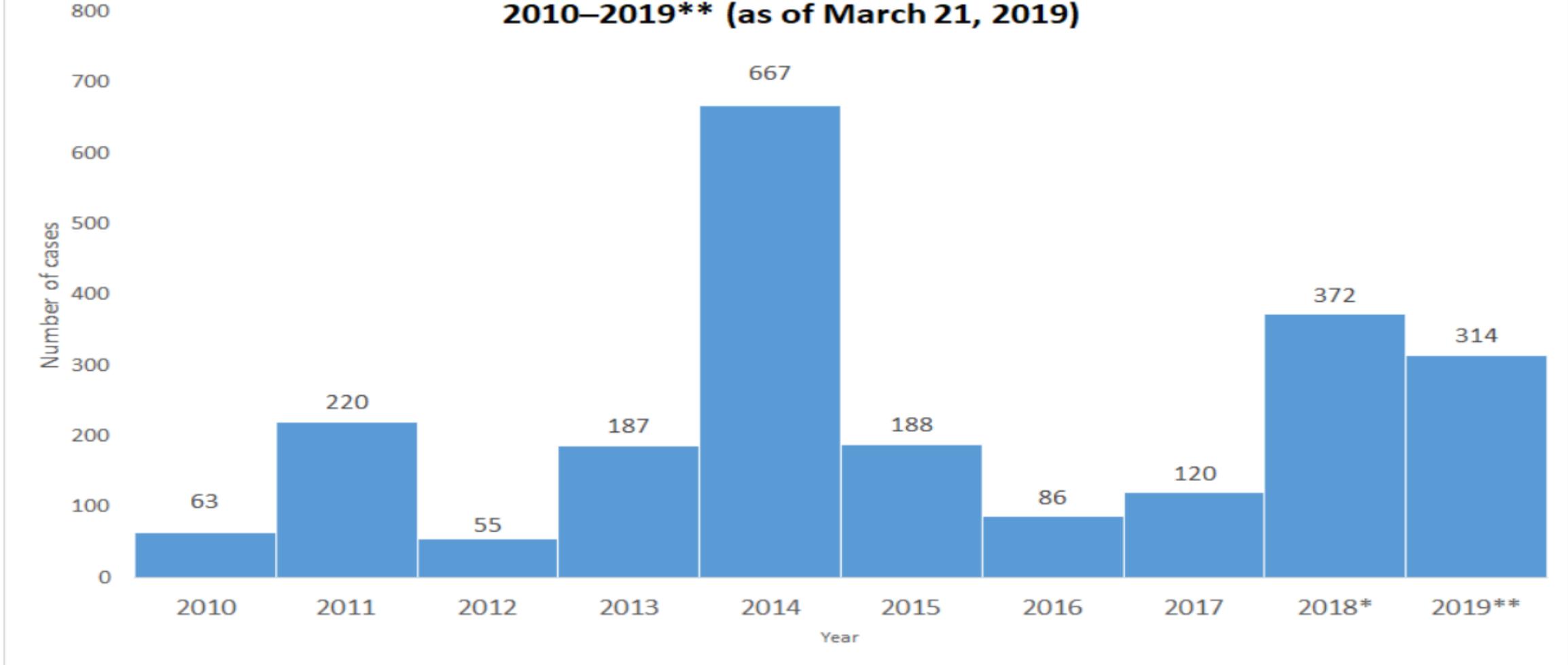
New Mobile App: PneumoRecs VaxAdvisor

- Quickly and easily see which pneumo needs and when
 - Enter a patient's age (works for all ages)
 - Note any underlying medical conditions
 - Get patient-specific guidance consistent with CDC
- iOS and Android devices
- [cdc.gov/vaccines/pneumoapp](https://www.cdc.gov/vaccines/pneumoapp)



Measles Update

NUMBER OF MEASLES CASES REPORTED BY YEAR 2010–2019** (as of March 21, 2019)



*Cases as of December 29, 2018. Case count is preliminary and subject to change.

Cases as of March 21, 2019. Case count is preliminary and subject to change. **Data are updated weekly.

Guidance for Health Care Personnel

www.cdc.gov/measles/hcp/index.html

- **Be vigilant about measles**
- **Consider measles in patients with febrile rash illness and clinically compatible measles symptoms—cough, coryza, and conjunctivitis**
- **Ask patients about:**
 - Recent international travel
 - Recent travel to domestic venues frequented by international travelers
 - Recent contact with international travelers
 - History of measles in the community
- **Promptly isolate patients with suspected measles**

MMR Vaccination Recommendations*

- **Ensure all patients are up to date or have acceptable evidence of immunity**
 - Routine recommendations:
 - Children: Dose 1 at 12-15 months; Dose 2 at 4-6 years of age
 - Adults: Health care personnel, college and other students need 2 doses, separated by at least 4 weeks, and all other adults need 1 dose
 - International travel:
 - Infants 6 through 11 months should receive 1 dose of MMR**
 - Previously vaccinated children 1 through 3 years can receive a second dose of MMR at least 4 weeks after the first dose
 - Persons 4 years of age and older should receive 2 doses, separated by at least 4 weeks
- **People who received 2 doses of MMR vaccine as children according to the U.S. vaccination schedule are considered protected for life.**

*Without evidence of immunity

**ACIP off-label recommendation

MMWR 2013;62(RR-4)

Evidence of Measles Immunity

- **Evidence of measles immunity:**
 - 2 appropriately spaced and documented doses of MMR vaccine,
 - Laboratory evidence of immunity, or
 - Laboratory confirmation of disease.
- **No additional doses are indicated or recommended**
- **No serologic testing is recommended.**
- **For unvaccinated personnel born before 1957 who lack laboratory evidence of measles, mumps, or rubella immunity or laboratory confirmation of disease, facilities should consider vaccinating with 2 doses of MMR at the appropriate interval (for measles and mumps) or 1 dose of MMR (for rubella)**

2018–19 Influenza Season

2018–19 Influenza Season and Disease Burden Estimates

34.9 million – 40.1 million
flu **illnesses**



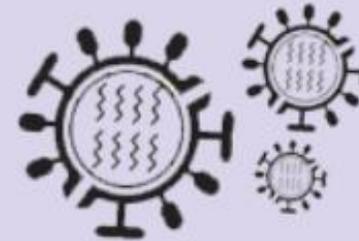
16.1 million – 18.8 million
flu **medical visits**



482,000 – 585,000
flu **hospitalizations**

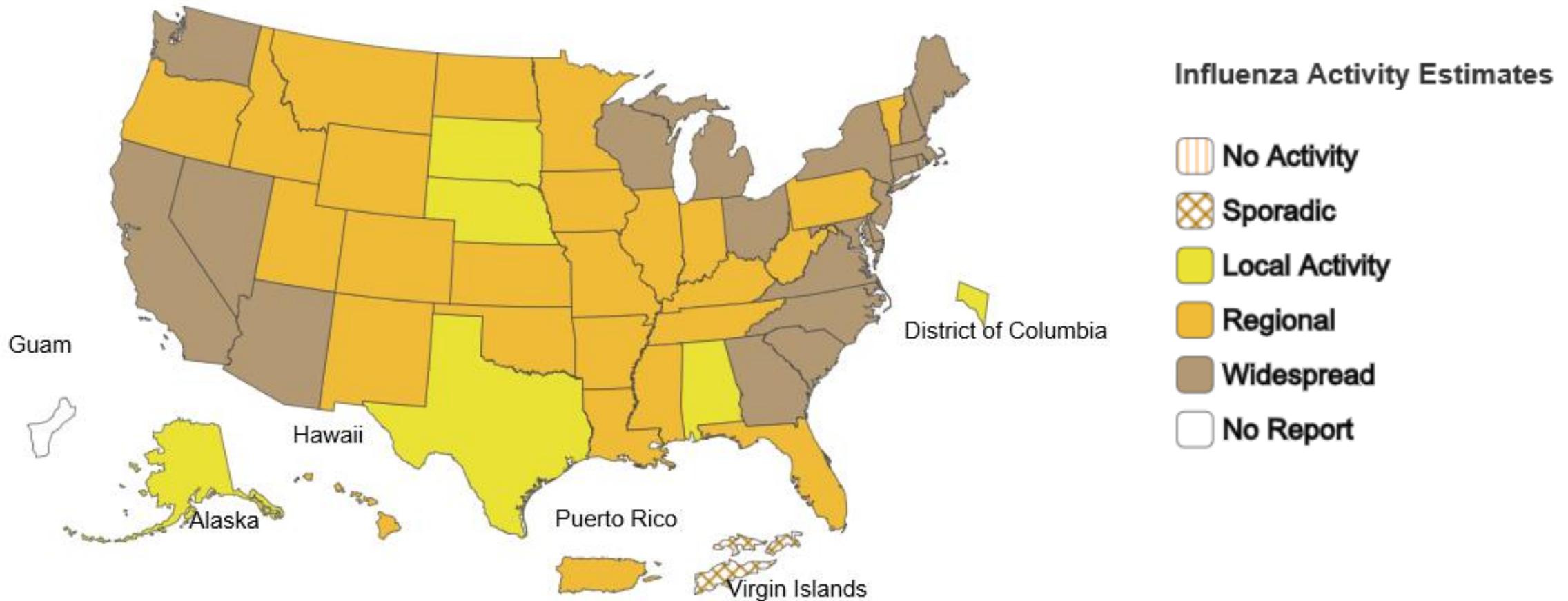


32,900 – 54,800
flu **deaths**



Influenza Estimates Reported by States and Territories

Week Ending April 6, 2019



What Do We Know? Week 14 ending April 6, 2019

- Influenza activity continues to decrease but remains elevated in the United States.
- Influenza A(H1N1)pdm09 viruses predominated October to mid-February, and influenza A(H3N2) viruses more commonly identified since late February. Small numbers of influenza B viruses also reported.
- 86 influenza-associated pediatric deaths have been reported
- Continue to vaccinate—don't stop!

Interim Estimates of 2018–19 Seasonal Influenza Vaccine Effectiveness — United States, February 2019

Influenza A and B	Vaccine effectiveness* Adjusted % (95% CI)†
Overall	47 (34 to 57)§
Age group	
6 mos–17 yrs	61 (44 to 73)§
18–49 yrs	37 (9 to 56)§
≥50 yrs	24 (-15 to 51)

* Vaccine effectiveness was estimated as $100\% \times (1 - \text{odds ratio} [\text{ratio of odds of being vaccinated among outpatients with influenza-positive test results to the odds of being vaccinated among outpatients with influenza-negative test results}])$; odds ratios were estimated using logistic regression.

† Adjusted for study site, age group, sex, race/ethnicity, self-rated general health, number of days from illness onset to enrollment, and month of illness (4-week intervals) using logistic regression.

§ Statistically significant at $p < 0.05$.

Looking Ahead

- **ACIP to vote on recommendations in June**
- **Many products will be available—IIV3, IIV4, and LAIV**
 - Indications vary by product, including age, formulation, and type
 - More than one product may be appropriate for any given person
- **ACIP/CDC express no preferences for any one type of influenza vaccine product if more than one is appropriate and available**
- **FDA approved 0.5 mL dose of Fluzone® in children as young as 6 months of age**

Dosages (Volume) of Pediatric Flu Vaccine Products for Children

Age	Product	Dosage (Amount)
6 through 35 months	Afluria	0.25 mL
	Fluzone	0.25 mL or 0.5 mL
	Fluarix	0.5 mL
	FluLaval	0.5 mL
3 years and older*	All products	0.5 mL

FDA approved 0.5 mL dose of Fluzone in children as young as 6 months of age

*Product eligibility may vary based on the FDA approved age indications

World Health Organization

2019–2020 Northern Hemisphere Vaccine Strains

- For 2019–2020, trivalent (three-component) vaccines are recommended to contain:
 - A/Brisbane/02/2018 (H1N1)pdm09-like virus*
 - A/Kansas/14/2017 (H3N2)-like virus*
 - B/Colorado/06/2017-like virus (Victoria lineage)
- **Quadrivalent (four-component) vaccines, which protect against a second lineage of B viruses, include:**
 - B/Phuket/3073/2013-like virus (Yamagata lineage)

Advisory Committee on Immunization Practices (ACIP) Updates and *MMWR* Publications

Updates in ACIP Recommendations for Adults

Policy Statements Published 2018/2019

- Hepatitis A (Oct 2018)
 - Doshani et al. *MMWR* Feb 2019;68(6);153–156
 - Added homelessness as indication for HepA
 - Nelson et al. *MMWR* Nov 2018; 67(43);1216–1220
 - Recommendations for postexposure prophylaxis and preexposure prophylaxis for international travel
- Hepatitis B (Feb 2018 ACIP Meeting)
 - Schillie et al. *MMWR* Apr 2018;67(15):455–458
 - Recommended use of CpG-adjuvanted HepB
- Tdap (Summary)
 - Liang et al. *MMWR* Apr 2018;67(2):1–44
- Influenza (Jun 2018)
 - Grohskopf et al. *MMWR* Aug 2018;67(3):1–20
 - Updated use of LAIV as option for 2018–2019

ACIP Recommendations: Hepatitis A Vaccine

HEPATITIS A VIRUS INFECTION

- CAUSES LIVER DISEASE
- EASILY SPREADS
- PREVENTABLE WITH A VACCINE



SPREADING PERSON-TO-PERSON

AMONG PERSONS REPORTING DRUG USE OR HOMELESSNESS



71%
HOSPITALIZED
3%
DIED

1,521
CASES
4
STATES
2017



INCREASE VACCINATION

- PEOPLE WHO USE DRUGS
- PEOPLE EXPERIENCING HOMELESSNESS
- OTHER AT-RISK GROUPS*



*CDC hepatitis A vaccine recommendations: bit.ly/CDChepA

Data from 2017 outbreaks as reported to CDC from California, Michigan, Kentucky, and Utah and published in Foster et al, *MMWR* 2018. bit.ly/MMWRhepA
#8291

[WWW.CDC.GOV](https://www.cdc.gov)

Updated Hepatitis A Recommendations

- The Advisory Committee on Immunization Practices updated hepatitis A recommendations for children and adults during the recent meetings
- Updated recommendations were published in the *MMWR* on 11/2/2018

MMWR 2018;67(No. 43):1208–10

MMWR 2018;67(No.43):1216–20

Morbidity and Mortality Weekly Report

Update: Recommendations of the Advisory Committee on Immunization Practices for Use of Hepatitis A Vaccine for Postexposure Prophylaxis and for Preexposure Prophylaxis for International Travel

Noele P. Nelson, MD, PhD¹; Ruth Link-Gelles, PhD¹; Megan G. Hofmeister, MD¹; José R. Romero, MD²; Kelly L. Moore, MD³; John W. Ward, MD¹; Sarah F. Schillie, MD¹

Postexposure prophylaxis (PEP) with hepatitis A (HepA) vaccine or immune globulin (IG) effectively prevents infection with hepatitis A virus (HAV) when administered within 2 weeks of exposure. Preexposure prophylaxis against HAV infection through the administration of HepA vaccine or IG provides protection for unvaccinated persons traveling to or working in countries that have high or intermediate HAV endemicity. The Advisory Committee on Immunization Practices (ACIP) Hepatitis Vaccines Work Group conducted a systematic review of the evidence for administering vaccine for PEP to persons aged >40 years and reviewed the HepA vaccine efficacy and safety in infants and the benefits of protection against HAV before international travel. The February 21, 2018, ACIP recommendations update and supersede previous ACIP recommendations for HepA vaccine for PEP and for international travel. Current recommendations include that HepA vaccine should be administered to all persons aged ≥12 months for PEP. In addition to HepA vaccine, IG may be administered to persons aged >40 years depending on the provider's risk assessment. ACIP also recommended that HepA vaccine be administered to infants aged 6–11 months traveling outside the United States when protection against HAV is recommended. The travel-related dose for infants aged 6–11 months should not be counted toward the routine 2-dose series. The dosage of IG has been updated where applicable (0.1 mL/kg). HepA vaccine for PEP provides advantages over IG, including induction of active immunity, longer duration of protection, ease of administration, and greater acceptability and availability.

Introduction

Postexposure prophylaxis (PEP) with hepatitis A (HepA) vaccine or immune globulin (IG) effectively prevents infection with hepatitis A virus (HAV) when administered within 2 weeks of exposure (1,2). The efficacy of IG or vaccine when administered >2 weeks after exposure has not been established.

Previous ACIP* recommendations for PEP included HepA vaccine for persons aged 1–40 years and IG for persons outside this age range; if IG was not available for persons aged >40 years, HepA vaccine could be administered (1). Preexposure prophylaxis against HAV infection through the administration of HepA vaccine or IG is also recommended for unvaccinated persons traveling to or working in countries that have high or intermediate HAV endemicity (3). Because HepA vaccine is not licensed for use in children aged <1 year, IG has historically been recommended for travelers in this age group; however, IG cannot be administered simultaneously with measles, mumps, and rubella (MMR) vaccine, which is also recommended for infants aged 6–11 months traveling internationally from the United States (4–6). This report provides recommendations for PEP use of HepA vaccine and IG, and use of HepA vaccine and IG for preexposure protection for persons who will be traveling internationally, including infants aged 6–11 months. This report updates and supersedes previous ACIP recommendations for HepA vaccine for PEP and for international travel (1).

Methods

During November 2016–February 2018, the ACIP Hepatitis Work Group[†] held monthly conference calls to review and

*Recommendations for routine use of vaccines in children, adolescents, and adults are developed by the Advisory Committee on Immunization Practices (ACIP). ACIP is chartered as a federal advisory committee to provide expert external advice and guidance to the Director of CDC on use of vaccines and related agents for the control of vaccine-preventable diseases in the civilian U.S. population. Recommendations for routine use of vaccines in children and adolescents are harmonized to the greatest extent possible with recommendations made by the American Academy of Pediatrics (AAP), the American Academy of Family Physicians (AAFP), and the American College of Obstetricians and Gynecologists (ACOG). Recommendations for routine use of vaccines in adults are harmonized with the recommendations of AAFP, ACOG, and the American College of Physicians (ACP). ACIP recommendations approved by the CDC Director become agency guidelines on the date published in the Morbidity and Mortality Weekly Report (MMWR). <https://www.cdc.gov/vaccines/acip>.

[†]The ACIP Hepatitis Vaccines Work Group comprises professionals from academic medicine (family medicine, internal medicine, pediatrics, obstetrics, infectious disease, occupational health, and preventive medicine specialists), federal and state public health entities, and medical societies.

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Hepatitis A Immunization Recommendations

- ACIP updated recommendations to add homelessness as an indication for routine hepatitis A vaccination during the October meeting
- Increasing vaccination coverage among all at-risk groups recommended

Morbidity and Mortality Weekly Report

Hepatitis A Virus Outbreaks Associated with Drug Use and Homelessness — California, Kentucky, Michigan, and Utah, 2017

Monique Foster, MD¹; Sumathi Ramachandran, PhD²; Katie Myatt, MS³; Danielle Donovan, MS³; Susan Bohm, MS³; Jay Fiedler, MS³; Bre Barberou, MPH⁴; Jim Collins, MPH⁵; Douglas Thoroughman, PhD⁶; Eric McDonald, MD⁷; Jonathan Ballant, MD⁷; Jeffrey Eason, MPH⁸; Cynthia Joergensen, DrPH¹

During 2017, CDC received 1,521 reports of acute hepatitis A virus (HAV) infections from California, Kentucky, Michigan, and Utah; the majority of infections were among persons reporting injection or noninjection drug use or homelessness. Investigations conducted by local and state health departments indicated that direct person-to-person transmission of HAV infections was occurring, differing from other recent, large HAV outbreaks attributed to consumption of contaminated commercial food products. Outbreaks with direct HAV transmission among persons reporting drug use or homelessness signals a shift in HAV infection epidemiology in the United States, and vaccination of these populations at high risk can prevent future outbreaks.

Epidemiologic Investigation

Outbreak cases were defined as those meeting the 2012 CDC-Council of State and Territorial Epidemiologists' (CSTE) definition of acute hepatitis A infection,* having a specimen matching an outbreak strain, or an epidemiologic link to a previously identified case. Local and state health department personnel reviewed clinical charts and interviewed patients using standard questionnaires that evaluated risk factors associated with infection, including recent drug use, sexual history, housing status, recent international travel, and contact with another person with HAV infection.

Among states reporting increases in HAV infections to CDC outside or inside the National Notifiable Disease Surveillance System, only California, Kentucky, Michigan, and Utah reported sustained within-state transmission. This report includes outbreaks that occurred during 2017 in these four states. Additional cases reported from other states were excluded because they were attributed to HAV exposure during travel to one of the four outbreak states, and because prolonged, ongoing transmission did not occur in the other states.

During 2017, a total of 1,521 outbreak-associated HAV cases were reported from California, Kentucky, Michigan, and Utah, with 1,073 (71%) hospitalizations and 41 (3%) deaths (Table 1). Among patients for whom clinical or laboratory records were available for review, 42 (3%) had confirmed or probable hepatitis B virus coinfection, and 341 (22%) had confirmed or probable hepatitis C virus coinfection. Overall, 866 (57%) patients reported drug use, homelessness, or both (Table 2). Among all cases, 818 (54%) had an indication for hepatitis A vaccination before becoming infected (i.e., using drugs or being men who had sex with men [MSM]) as recommended by the Advisory Committee on Immunization Practices (ACIP) (1).

Laboratory Investigation

When available, serum specimens from patients who met the CSTE case definition were sent to CDC's Division of Viral Hepatitis laboratory for HAV RNA isolation, genotyping, and genetic characterization. HAV RNA was extracted from immunoglobulin M antibody-positive serum samples and used to amplify and Sanger-sequence a 315–base-pair fragment of the VP1/P2B region (2). During 2017, 1,169 specimens from outbreak-associated cases from the four affected states were sent to CDC for additional testing. A total of 1,054 (90%) specimens had HAV confirmed by polymerase chain reaction, 1,014 (96%) of which tested positive for a genotype 1b viral strain. The strains circulating in California, Kentucky, and Utah were genetically different from those circulating in Michigan.

Public Health Response

CDC worked with affected local and state health departments to apply control measures through health advisories, public education, and vaccination clinics that provided outreach and vaccination to the targeted populations. Vaccine was administered in jails, emergency departments, syringe exchange programs, drug treatment facilities, and homeless shelters. In certain jurisdictions, investigation teams also visited homeless encampments to educate and vaccinate unsheltered homeless groups. Although reporting of new outbreak cases in California has ended, new case investigations continue in Kentucky, Michigan, and Utah. Vaccination campaigns also continue for MSM and persons who use drugs or report homelessness in the affected states.

Discussion

After the introduction of hepatitis A vaccine in 1996, the incidence of reported HAV infection steadily decreased in the United States until 2011 and then stabilized at an annual

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*<https://www.cdc.gov/nndss/conditions/hepatitis-a/acute/case-definition/2012>

Updated Hepatitis A Immunization Recommendations: Children and Adults

- **Recommended for adults who have a specific risk or lack a risk factor but want protection**
 - **Homelessness**
 - Travel to or work in countries with high or intermediate hepatitis A endemicity
 - Men who have sex with men
 - Injection or noninjection drug use
 - Clotting factor disorders
 - Chronic liver disease
 - Close, personal contact with an international adoptee
 - Healthy adults through age 40 years who have recently been exposed to hepatitis A virus
 - Work with hepatitis A virus in a research laboratory or with nonhuman primates infected with hepatitis A virus

Hepatitis A Immunization Recommendations for Children

- **Routinely recommended for children 12 through 23 months of age**
 - 2-dose schedule (0, 6 months)
- **Vaccination should be integrated into the routine vaccination schedule**
- **Children who are not vaccinated by 2 years of age can be vaccinated at subsequent visits**

International Travel and Infants: 6 Through 11 Months of Age

- **International travel recommendations* for children 6 through 11 months of age:**
 - Hepatitis A: IG (previous)
 - Measles, mumps, rubella: MMR vaccine
- **Problematic if both are indicated as IG and live, attenuated vaccines cannot be administered simultaneously**

*Countries with high or intermediate hepatitis A endemicity

Hepatitis A Vaccine for International Travelers: Infants

- Administer a single dose of HepA vaccine to infants 6–11 months of age
- Infants should restart the 2-dose series of HepA vaccine at 12 months of age or older as recommended

Vaccine Recommendations and Guidelines of the ACIP

ACIP Recs Home

Vaccine-Specific Recommendations

- Anthrax
- BCG
- Cholera
- DTaP/Tdap/Td
- Hepatitis A**
- Hepatitis B
- Hib
- HPV
- Influenza
- Japanese Encephalitis
- MMR
- MMRV
- Meningococcal
- Pneumococcal
- Polio
- Rabies
- Rotavirus
- Smallpox

CDC > ACIP Recs Home > Vaccine-Specific Recommendations

Hepatitis A ACIP Vaccine Recommendations

Advisory Committee on Immunization Practices (ACIP)

MMWR as Published in *Morbidity and Mortality Weekly Report (MMWR)*

The [Advisory Committee on Immunization Practices \(ACIP\)](#) provides advice and guidance to the Director of the CDC regarding use of vaccines and related agents for control of vaccine-preventable diseases in the civilian population of the United States. Recommendations made by the ACIP are reviewed by the CDC Director and, if adopted, are published as official CDC/HHS recommendations in the *Morbidity and Mortality Weekly Report (MMWR)*.

CURRENT Hepatitis A Vaccine Recommendations

- *MMWR*, September 18, 2009, Vol 58, #36
[Updated Recommendations from the ACIP for Use of Hepatitis A Vaccine in Close Contacts of Newly Arriving International Adoptees](#)
[Print version](#)  (1.78 MB, 36 pages)
- *MMWR*, October 19, 2007, Vol 56, #41
[Update: Prevention of Hepatitis A After Exposure to Hepatitis A Virus and in International Travelers: Updated Recommendations of the ACIP](#)
[Print version](#)  (32 pages)
- *MMWR*, October 12, 2007, Vol 56, #40
[Notice to Readers: FDA Approval of an Alternate Dosing Schedule for a Combined Hepatitis A and B Vaccine \(Twinrix®\)](#)
[Print version](#)  (28 pages)
- *MMWR*, May 19, 2006, Vol 55, #RR-07
[Prevention of Hepatitis A Through Active or Passive Immunization](#)
[Print version](#)  (1.18 MB, 30 pages)

See also:

- [ACIP VFC Resolution](#)

On This Page

- [Current Recommendations](#)
- [Archived](#)

Summary: Hepatitis A Vaccine Recommendations and International Travel

Age	
Infants 5 months of age or younger	IG
Infants 6 through 11 months of age	Vaccine (or IG ¹)
Healthy persons 1 year of age or older	Vaccine
Special Populations	
Persons with a vaccine contraindication	IG
Immunocompromised persons	Vaccine with addition of IG ²
Persons with chronic liver disease	Vaccine
Pregnant women	Vaccine

¹Based on provider risk assessment and availability of vaccine or IG

²If measles is not endemic in the destination area

What Do You Think?

- **Achal is 13 months old. A dose of hepatitis A vaccine was administered at 10 months of age due to international travel. When should the next dose of vaccine be administered?**
 - 15 months of age
 - 18 months of age
 - Now

ACIP Recommendations: Hepatitis B Vaccine

Heplisav-B (HepB-CpG)

Storage

Store in the refrigerator between 2°C and 8°C (36°F and 46°F)

Ages

18 years of age and older

Schedule

Administer 2 doses separated by 4 weeks

Administration

Intramuscular (IM) injection in the deltoid
Can be administered at the same clinical visit as other vaccines. Administer in separate injection sites, 1 inch apart (if possible)

Contraindication

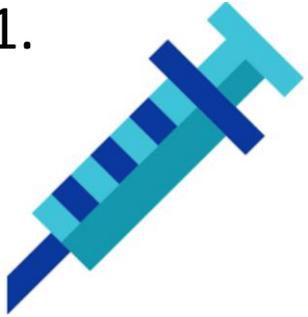
History of severe allergic reaction (e.g., anaphylaxis) after a previous dose of any hepatitis B vaccine or to any component of Heplisav-B, including yeast

Additional Heplisav-B Considerations

- **2-dose HepB series only applies when BOTH doses are Heplisav-B, administered at least 4 weeks apart**
 - Any 2 doses of Heplisav-B separated by 4 weeks is considered complete, even if the patient has had other HepB vaccine products
- **Until safety data are available for Heplisav-B, providers should vaccinate pregnant women needing HepB vaccination with Engerix-B or Recombivax HB**

Scenarios

1.



HepB
Engerix-B or RecombivaxHB
01/01/2018



HepB-CpG
Heplisav-B
01/02/2018



HepB-CpG
Heplisav-B
02/02/2018

Completed series
No additional doses
are needed

2.



HepB
Engerix-B or RecombivaxHB
01/01/2018



HepB-CpG
Heplisav-B
02/01/2018



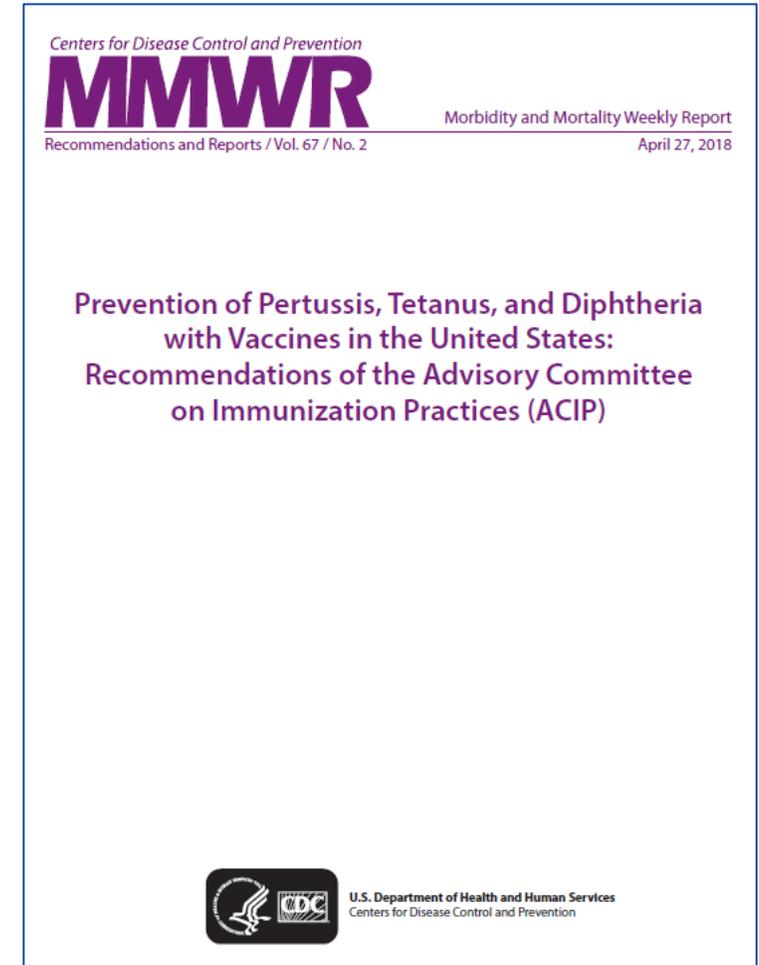
HepB
Engerix-B or RecombivaxHB
05/01/2018

Completed series
No additional doses
are needed

ACIP Recommendations: Tdap Vaccine

ACIP Recommendations: DTaP and Tdap

- DTaP/Tdap recommendations were published on April 27, 2018
- Compiles and summarizes all previously published ACIP recommendations regarding prevention and control of pertussis, tetanus, and diphtheria, specifically after the introduction of acellular pertussis vaccines, DTaP and Tdap vaccines



ACIP Adolescent Recommendations: Tdap

- **Routinely recommended at 11–12 years of age**
 - Don't forget MenACWY, too!
- **Catch-up adolescents 13 years of age and older who were not vaccinated**
- **Adolescents who received Tdap inadvertently or as part of the catch-up series between 7–10 years of age should be given the routine adolescent Tdap dose at 11–12 years of age**

Adolescents and Catch-Up

■ Strategies:

- Use the IIS
 - Assess at every encounter
 - Check for needed vaccines in the IIS *BEFORE* determining vaccine to administer
- Use standing orders
- Have resources and printable guidance available for staff

The screenshot displays the Immunization Action Coalition website. At the top, there is a navigation bar with the site name, a newsletter sign-up button, a search bar, and a menu with categories: Favorites, Handouts & Staff Materials, Clinic Tools, Vaccine Information Statements, Vaccines, and Talking about Vaccines. Below the navigation bar, the page title is 'Handouts: Topic Index' and the sub-section is 'Standing Orders Templates for Administering Vaccines'. A left sidebar lists various handout categories such as 'Administering Vaccines', 'Adolescent Vaccination', and 'Adult Vaccination'. The main content area features three handout preview cards: '10 Steps to implementing standing orders for immunization in your practice setting', 'Using Standing Orders for Administering Vaccines: What You Should Know', and 'Diphtheria, tetanus, acellular pertussis vaccine (DTaP) - children'. A fourth card on the right is titled 'Guidance for Developing Admission Orders in Labor & Delivery and Newborn Units to Prevent Hepatitis B Virus Transmission'.

ACIP Adult Recommendations: Tdap

- **Administer Tdap vaccine to persons 11 years of age and older who were NOT *previously vaccinated* and to those with unknown vaccination status**
 - Persons who were vaccinated with Tdap during adolescence (or at another time) = *previously vaccinated*, including:
 - Health care personnel
 - New fathers
 - Close contacts of newborns
 - Day care workers or babysitters
 - No additional doses are recommended

No Additional Doses of Tdap for the General Population

- ACIP recognizes the increasing burden of pertussis and the need for an effective strategy to reduce this burden
- A study evaluating additional doses of Tdap administered at either a 5- or 10-year interval suggested that the reduction in pertussis disease burden would be limited
- ACIP concluded that the data do not support a general recommendation for a routine second dose of Tdap, and that the public health impact of routinely recommending a second dose of Tdap would be limited

ACIP Recommendations for Pregnant Women

■ Pregnant women:

- Administer Tdap during each pregnancy, preferably at 27 through 36 weeks' gestation
- If not administered during pregnancy, Tdap should be administered immediately postpartum to women **not previously vaccinated** with Tdap
- Additional doses of Tdap are not indicated for previously vaccinated postpartum women
 - History of an adolescent dose (or Tdap given at another time) = previously vaccinated

Tdap and Pregnant Women

■ Vaccination coverage for pregnant women:

- 2010 and earlier <1%
- 2013 28%
- 2015 53%

■ 96% of Tdap vaccinations were administered in physicians' offices or clinics

Maternal Vaccination



Resources for healthcare professionals

Vaccines help keep your pregnant patients and their growing families healthy.

Last Updated September, 2016

Vaccine	Before pregnancy	During pregnancy	After pregnancy	Type of vaccine
Influenza	Yes	Yes, during flu season	Yes	Inactivated
Tdap	May be recommended; it is better to vaccinate during pregnancy when possible	Yes, during each pregnancy	Yes, immediately postpartum, if Tdap never received in lifetime; it is better to vaccinate during pregnancy	Toxoid/ Inactivated
Td	May be recommended	May be recommended, but Tdap is preferred	May be recommended	Toxoid
Hepatitis A	May be recommended	May be recommended	May be recommended	Inactivated
Hepatitis B	May be recommended	May be recommended	May be recommended	Inactivated
Meningococcal	May be recommended	Base decision on risk vs. benefit; inadequate data for specific recommendation	May be recommended	Inactivated
Pneumococcal	May be recommended	Base decision on risk vs. benefit; inadequate data for specific recommendation	May be recommended	Inactivated
HPV	May be recommended (through 26 years of age)	No	May be recommended (through 26 years of age)	Inactivated
MMR	May be recommended; once received, avoid conception for 4 weeks	No	May be recommended	Live
Varicella	May be recommended; once received, avoid conception for 4 weeks	No	May be recommended	Live

For more information, visit: www.cdc.gov/vaccines/pregnancy

Get an answer to your specific question by e-mailing cdcinfo@cdc.gov or calling 800-CDC-INFO (232-4636)



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

CS-1409215-100-104 09/27/2016

CDC Clinical Resources for Health Care Personnel: Tdap

- Pink Book webinar series with free CE www.cdc.gov/vaccines/ed/webinar-epv/index.html
- Updated ACIP recommendations www.cdc.gov/mmwr/volumes/67/rr/pdfs/rr6702a1-H.pdf
- Catch-up guidance for children 7 through 18 years of age www.cdc.gov/vaccines/schedules/downloads/child/job-aids/tdap.pdf
- HCP materials on vaccinating pregnant women www.cdc.gov/vaccines/pregnancy/hcp/index.html

Catch-Up Guidance for Children 7 through 18 Years of Age Tetanus, Diphtheria, and Pertussis-Containing Vaccines: Tdap/Td¹

IF current age is	AND # of previous Doses of DTaP, DT, Td or Tdap is	AND ²	AND	AND ²	THEN	Next Dose Due
7 through 18 years of age ³	3	Dose 1 was given before 12 months of age	It has been at least 6 calendar months since Dose 2	Any dose was Tdap	Give Dose 4 (Td) today	Td in 10 years
			No dose was	No dose was	Give Dose 4	

IF current age is	AND # of previous Doses of DTaP, DT, Td or Tdap is	AND ²	AND	AND ²	THEN	Next Dose Due
7 through 18 years of age ³	3	Dose 1 was given at 12 months of age or older	7-10 years of age	4	11 years of age or older	

¹Vaccine information: Tdap: Administer to persons 7 or pertussis-containing vaccine. Tdap products not vaccinated with Tdap or with a contraindication to Tdap or Td given as doses 1-3 prior to 7 years of age.
²For children who received Tdap between 7 through a dose of Td should be given 10 years after the dose.
³Tdap may be administered regardless of the interval.
⁴Tdap may be administered regardless of the interval.
Reference: Recommended immunization schedule schedules/downloads/child/0-18yrs-child-combine

Maternal Vaccination

Resources for healthcare professionals

Vaccines help keep your pregnant patients and their growing families healthy.

Last Updated September, 2016

Vaccine	Before pregnancy	During pregnancy	After pregnancy	Type of vaccine
Influenza	Yes	Yes, during flu season	Yes	Inactivated
Tdap	May be recommended; it is better to vaccinate during pregnancy when possible	Yes, during pregnancy	Yes, immediately postpartum, if Tdap never received in lifetime; it is better to vaccinate during pregnancy	Toxoid/ Inactivated
Td	May be recommended	May be recommended, but Tdap is preferred	May be recommended	Toxoid
Hepatitis A	May be recommended	May be recommended	May be recommended	Inactivated
Hepatitis B	May be recommended	May be recommended	May be recommended	Inactivated
Meningococcal	May be recommended	Base decision on risk vs. benefit; inadequate data for specific recommendation	May be recommended	Inactivated
Pneumococcal	May be recommended	Base decision on risk vs. benefit; inadequate data for specific recommendation	May be recommended	Inactivated
HPV	May be recommended (through 26 years of age)	No	May be recommended (through 26 years of age)	Inactivated
MMR	May be recommended; once received, avoid conception for 4 weeks	No	May be recommended	Live
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For more information, visit: www.cdc.gov/vaccines/pregnancy
Get an answer to your specific question by e-mailing cdcinfo@cdc.gov or calling 800-CDC-INFO (232-4636)



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

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What Do You Think?

- **Lauren (age 24) and her new baby are being discharged today. She was not vaccinated with Tdap vaccine during the pregnancy. Her immunization history includes Tdap at age 16**
- **Should you administer Tdap prior to discharge?**
 - a) Yes
 - b) No

ACIP Recommendations: Shingrix

Vaccines for Prevention of Zoster (Shingles)

Product (ACIP Abbreviation)	Type	ACIP Age Recommendations
Zostavax (ZVL)	Live, attenuated	60 years of age and older*
Shingrix (RZV)	Inactivated, adjuvanted	50 years of age and older

*Zostavax is FDA approved for persons 50 years of age and older

RZV Zoster Vaccine: Shingrix

- **Storage:** Store vaccine AND diluent between 2°C and 8°C (36°F and 46°F)
- **Preparation:** Use the adjuvanted diluent supplied by the manufacturer to reconstitute the vaccine just before administering
- **Schedule:** 2 doses, 2 to 6 months apart
- **Route: IM injection**
 - Site: Deltoid or the thigh may be used if necessary
 - Needle gauge: 22–25 gauge
 - Needle length: Varies by weight and injection technique
- **May administer during the same clinical visit as other needed vaccines**
 - Administer in a separate limb from other vaccines, if possible

Protect your patients with the new shingles vaccine

CDC recommends new shingles vaccine (Shingrix) for adults 50 and older

patients: 50+ years old	doses: 2-6 months apart	administer: intra- muscular in the deltoid	storage: 36°-46° refrigerate
--------------------------------------	--------------------------------------	---	---

Who should get Shingrix

Give Shingrix (Recombinant Zoster Vaccine) to immunocompetent adults 50 years and older, including those who

- had shingles in the past
- received Zostavax® (Zoster Vaccine Live) at least 8 weeks prior
- have health conditions, such as chronic renal failure, diabetes mellitus, rheumatoid arthritis, or chronic pulmonary disease
- are receiving other vaccines, such as influenza and pneumococcal vaccines, at the same visit
- are taking low-dose immunosuppressive therapy

While Shingrix is not contraindicated in immunocompromised people, it is not recommended by the Advisory Committee on Immunization Practices (ACIP) at this time. ACIP will review evidence for Shingrix in immunocompromised people as it becomes available.

Who should not get Shingrix

You should not give Shingrix to a patient who has ever had a severe allergic reaction, such as anaphylaxis, to a component of this vaccine, or after a dose of Shingrix. Consider delaying vaccination if your patient is pregnant, lactating, or experiencing an acute episode of shingles.

Administering and storing Shingrix

- Adults 50 years and older should receive 2 doses of Shingrix. Give the second dose 2 to 6 months after the first.
- Administer Shingrix intramuscularly in the deltoid region of the upper arm with a 1- to 1.5-inch needle.
- Both vials of Shingrix must be refrigerated at a temperature of 36-46° F. Do not use if exposed to temperatures below 36° F.

Reconstitution

- Prepare Shingrix by reconstituting the antigen component with the adjuvant suspension component.
- Either administer it immediately, or store it in the refrigerator and use it within 6 hours of reconstitution. Otherwise, discard it.

Cost and insurance

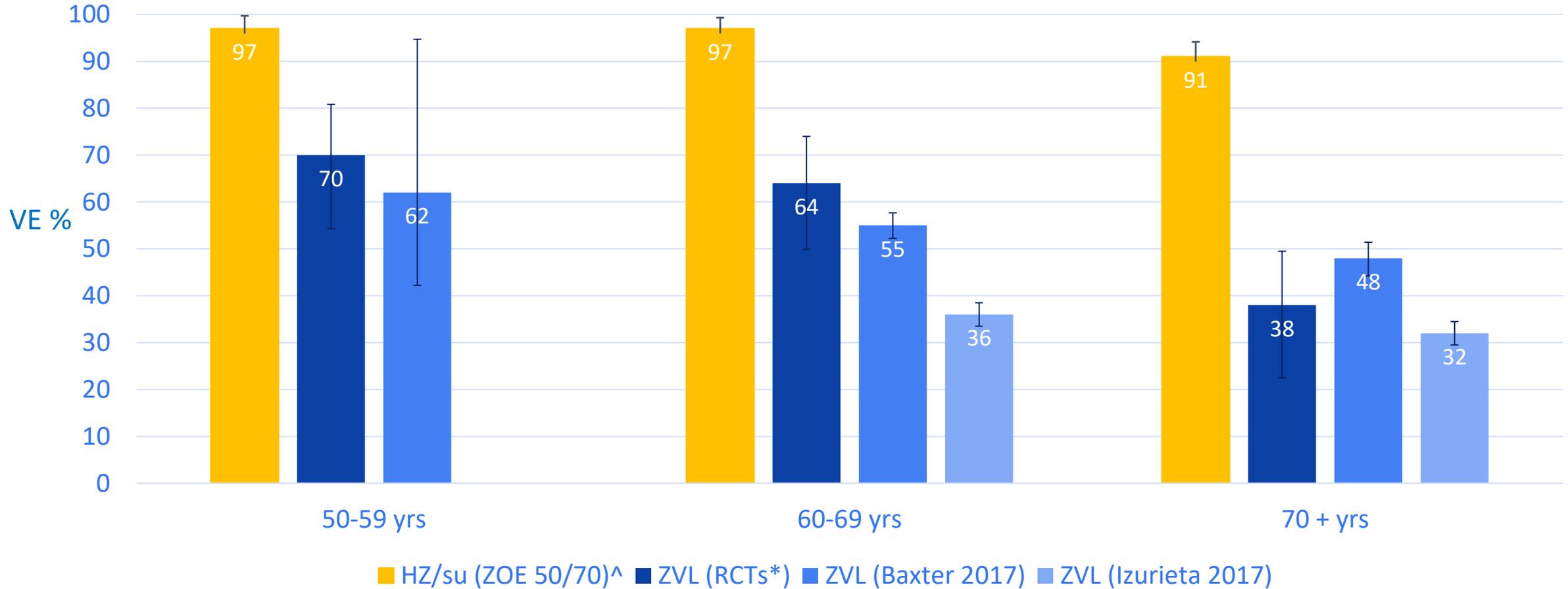
Shingrix is now covered by most health insurance plans. Tell your patients to contact their health insurance providers ahead of time to see if they will cover the vaccine



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www.cdc.gov/shingles/vaccination
National Center for Immunization and Respiratory Diseases (NCIRD)

Vaccine Efficacy and Effectiveness against HZ for HZ/su and ZVL, by Age Group, During the First 4[‡] Years Following Vaccination



[‡]Median follow-up may be less than 3 yrs: Schmader 2012= 1.3 yrs
[^]ZOE 50/70= 50–59 and 60–69 yrs: Lal 2015, 70+ yrs: Cunningham 2016
^{*}RCTs= 50–59 yrs: Schmader 2012, 60-69 and 70+ yrs: Oxman 2005

ACIP Zoster Recommendations

- **Persons 50 years of age and older should be vaccinated with zoster vaccine**
- **Shingrix is preferred to Zostavax for persons 60 years and older**
- **Administer 2 doses of Shingrix to immunocompetent persons**
 - Regardless of previous history of vaccination with varicella-containing vaccines—Varivax or Zostavax
 - Separate Shingrix and varicella-containing vaccines by at least 8 weeks

Ensure Your Patients Get Both Doses!

- There are currently ordering limits and intermittent shipping delays for Glaxo Shingrix vaccine
- Use proven strategies to help patients complete the series, including:
 - Use a reminder and recall system to contact patients when you have Shingrix
 - Give first consideration to patients due for their second dose of Shingrix
 - If you are out of Shingrix and a patient needs a second dose, refer the patient to another provider in the community that has Shingrix
 - Be sure to enter your patients' current vaccination information into your state's immunization information system (IIS)
 - As supply becomes less constrained, notify eligible patients so they can come in to get their first dose of Shingrix

RZV (Shingrix) Adverse Reactions

Local reactions	49%
Local reactions – Grade 3	9.4%
Systemic reactions (headache, malaise, fatigue)	45–78%
Systemic reactions (headache, malaise, fatigue) – Grade 3	11%

Adverse Reactions after Shingrix

- **Educate patients regarding:**
 - Potential adverse reactions, including injection site and systemic reactions
 - The need for a second dose—even if s/he has an adverse reaction
- **Offer comfort measures and strategies**



CDC Clinical Resources for Health Care Personnel: Zoster

- **Pink Book webinar series with free CE**
<https://www.cdc.gov/vaccines/ed/webinar-epv/index.html>
- **Shingles (Herpes Zoster) vaccination information for health care providers** www.cdc.gov/vaccines/vpd/shingles/hcp/index.html
- **Shingrix fact sheet**
www.cdc.gov/shingles/downloads/shingles-factsheet-hcp.pdf
- **FAQs on Shingrix** www.cdc.gov/vaccines/vpd/shingles/hcp/shingrix/faqs.html
- **Everything you need to know about Shingrix video**
www.medscape.com/viewarticle/895228?src=par_cdc_stm_mscpedt&faf=1

What Do You Think?

- **There are 2 zoster vaccines. Shingrix is administered as a 2-dose series. Can a documented dose of Zostavax count toward completion of the series if proper spacing is followed?**
 - a) Yes
 - b) No

CDC Immunization Resources for HCP

New Design for Schedule Web Pages

Immunization Schedules

CDC > Schedules Home > For Health Care Providers



Table 1. Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2019

Always make recommendations by determining needed vaccines based on age (Table 1), determining appropriate intervals for catch-up, if needed (Table 2), assessing for medical indications (Table 3), and reviewing special situations (Notes).

[Get Email Updates](#)

- Table 1. By age
- Table 2. Catch-up schedule
- Table 3. By medical indications
- Changes to this year's schedule
- Parent-friendly schedule
- Resources for health care providers

- [8.5"x11" print color](#) [8 pages]
- [8.5"x11" print black and white](#) [8 pages]
- [Compliant version of this schedule](#)
- [Vaccines in the Child and Adolescent Immunization Schedule](#)
- [Learn how to display current schedules from your website.](#)

[Download Schedules App](#)

Legend

- Range of recommended ages for all children
- Range of recommended ages for catch-up immunization
- Range of recommended ages for certain high-risk groups
- Range of recommended ages for non-high-risk groups that may receive vaccine, subject to individual clinical decision-making
- No recommendation

For Health Care Providers

Child and Adolescent Immunization Schedule (birth through 18 years of age)

Table 1. Recommended Child and Adolescent Immunization Schedule, United States, 2019

For Parents & Adolescents

Parent-Friendly Schedule for Infants and Children

For Health Care Providers

Immunization Practices

Immunization Schedules for Invasive Pneumococcal Vaccines

Reviewed: February 5, 2019
Immunization and Respiratory Diseases

Table 2. Catch-up immunization schedule for persons aged 4 months–18 years who start late or who are more than 1 month behind, United States, 2019

Always make recommendations by determining needed vaccines based on age (Table 1), determining appropriate intervals for catch-up, if needed (Table 2), assessing for medical indications (Table 3), and reviewing special situations (Notes).

 [Get Email Updates](#)

The tables below provide 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.

Navigation menu with buttons for:

- Table 1. By age
- Table 2. Catch-up schedule** (highlighted with a red border)
- Table 3. By medical indications
- Changes to this year's schedule
- Parent-friendly schedule
- Resources for health care providers

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[Download Schedules App](#) 

Vaccine Catch-Up Guidance

CDC has developed catch-up guidance job aids to assist health care providers in interpreting Table 2 in the childhood and adolescent immunization schedule.

- [Pneumococcal Conjugate Vaccine \(PCV\) Catch-Up Guidance for Children 4 Months through 4 Years of Age](#)  [3 pages]
- [Haemophilus influenzae type b-Containing Vaccines Catch-Up Guidance for Children 4 Months through 4 Years of Age](#)
 - [Hib vaccine products: ActHIB, Pentacel, Hiberix, or unknown](#)  [3 pages]
 - [Hib vaccine products: PedvaxHIB vaccine only](#)  [2 pages]
- [Diphtheria-, Tetanus-, and Pertussis-Containing Vaccines Catch-Up Guidance for Children 4 Months through 6 Years of Age](#)  [2 pages]
- [Tetanus-, Diphtheria-, and Pertussis-Containing Vaccines Catch-Up Guidance for Children 7 through 18 Years of Age](#)  [2 pages]

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Table 1. By age | **Table 2. Catch-up schedule** | Table 3. By medical indications | Changes to this year's schedule | Parent-friendly schedule | Resources for health care providers

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Catch-Up Guidance for Healthy¹ Children 4 Months through 4 Years of Age

Pneumococcal Conjugate Vaccine: PCV

The table below provides guidance for children whose vaccinations have been delayed. Start with the child's age and information on previous doses (previous doses must be documented and must meet minimum age requirements and minimum intervals between doses). Use this table in conjunction with table 2 of the Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger, found at www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html.

IF current age is	AND # of previous doses is	AND		THEN	Next dose due
4 through 6 months	0 or unknown	→	→	Give Dose 1 today	Give Dose 2 at least 4 weeks after Dose 1
	1	→	It has been at least 4 weeks since Dose 1	Give Dose 2 today	Give Dose 3 at least 4 weeks after Dose 2
		→	It has not been at least 4 weeks since Dose 1	No dose today	Give Dose 2 at least 4 weeks after Dose 1
	2	→	It has been at least 4 weeks since Dose 2	Give Dose 3 today	Give Dose 4 (Final Dose) at 12 months of age or older
		→	It has not been at least 4 weeks since Dose 2	No dose today	Give Dose 3 at least 4 weeks after Dose 2
	7 through 11 months	0	→	→	Give Dose 1 today
1		Dose 1 was given before 7 months of age	It has been at least 4 weeks since Dose 1	Give Dose 2 today	Give Dose 3 (Final Dose) at least 8 weeks after Dose 2 and at 12 months of age or older
			It has not been 4 weeks since Dose 1	No dose today	Give Dose 2 at least 4 weeks after Dose 1
		Dose 1 was given at 7 months or older	It has been at least 4 weeks since Dose 1	Give Dose 2 today	Give Dose 3 (Final Dose) at least 8 weeks after Dose 2 and at 12 months of age or older
			It has not been 4 weeks since Dose 1	No dose today	Give Dose 2 at least 4 weeks after Dose 1
2		Dose 2 was given before 7 months of age	It has been at least 4 weeks since Dose 2	Give Dose 3 today	Give Dose 4 (Final Dose) at least 8 weeks after Dose 3 and at 12 months of age or older
			It has not been 4 weeks since Dose 2	No dose today	Give Dose 3 at least 4 weeks after Dose 2
		Dose 2 was given at 7 months or older	→	No dose today	Give Dose 3 (Final Dose) at least 8 weeks after Dose 2 and at 12 months of age or older

¹Refer to the notes of the 2019 Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger for immunization guidance for children at increased risk for pneumococcal disease.

Reference: Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger—United States, 2019. www.cdc.gov/vaccines/schedules/downloads/child/0-18yrs-child-combined-schedule.pdf.



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Catch-Up Guidance for Healthy¹ Children 4 Months through 4 Years of Age

Haemophilus influenzae type B Vaccines: ActHIB, Pentacel, Hiberix, or Unknown

The table below provides guidance for children whose vaccinations have been delayed. Start with the child's age and information on previous doses (previous doses must be documented and must meet minimum age requirements and minimum intervals between doses). Use this table in conjunction with table 2 of the Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger, found at www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html.

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It has not been 4 weeks since Dose 2		No dose today	Give Dose 3 at least 4 weeks after Dose 2	
7 through 11 months	Unknown or 0	→	Give Dose 1 today	Give Dose 2 at least 4 weeks after Dose 1
	1	It has been at least 4 weeks since Dose 1	Give Dose 2 today	IF Dose 1 was given before 7 months of age, give Dose 3 at least 4 weeks after Dose 2
				IF Dose 1 was given at 7 months of age or older, give Dose 3 (Final Dose) at least 8 weeks after Dose 2 and no earlier than 12 months of age or older
	1	It has not been 4 weeks since Dose 1	No dose today	Give Dose 2 at least 4 weeks after Dose 1
		2	Dose 1 was given before 7 months of age	Give Dose 3 today
	It has not been 4 weeks since Dose 2			
2	Dose 1 was given at 7 months of age or older	→	No dose today	Give Dose 3 (Final Dose) at least 8 weeks after Dose 2, and no earlier than 12 months of age or older

¹ Refer to notes of the Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger – United States, 2019, for immunization guidance for children at increased risk for *Haemophilus influenzae* type b disease. Reference: Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger—United States, 2019, www.cdc.gov/vaccines/schedules/downloads/child/0-18yrs-child-combined-schedule.pdf



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

Catch-Up Guidance for Healthy¹ Children 4 Months through 4 Years of Age

Haemophilus influenzae type b Vaccines: PedvaxHIB Vaccine Only

The table below provides guidance for children whose vaccinations have been delayed. Start with the child's age and information on previous doses (previous doses must be documented and must meet minimum age requirements and minimum intervals between doses). Use this table in conjunction with table 2 of the Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger, found at www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html.

IF current age is	AND # of previous doses is	AND	AND	THEN	Next Dose Due
4 through 6 months	0	→	→	Give Dose 1 today	Give Dose 2 at least 4 weeks after Dose 1
	1	→	It has been at least 4 weeks since Dose 1	Give Dose 2 today	Give Dose 3 (Final Dose) at 12 months of age or older
			It has not been 4 weeks since Dose 1	No dose today	Give Dose 2 at least 4 weeks after Dose 1
7 through 11 months	0	→	→	Give Dose 1 today	Give Dose 2 at least 4 weeks after Dose 1
	1	→	It has been at least 4 weeks since Dose 1	Give Dose 2 today	Give Dose 3 (Final Dose) at least 8 weeks after Dose 2 and at 12 months of age or older
			It has not been 4 weeks since Dose 1	No dose today	Give Dose 2 at least 4 weeks after Dose 1
12 through 14 months	0	→	→	Give Dose 1 today	Give Dose 2 (Final Dose) at least 8 weeks after Dose 1
	1	Dose 1 was given before 12 months of age	It has been at least 4 weeks since Dose 1	Give Dose 2 today	Give Dose 3 (Final Dose) at least 8 weeks after Dose 2
			It has not been 4 weeks since Dose 1	No dose today	Give Dose 2 at least 4 weeks after Dose 1
	1	Dose 1 was given at 12 months of age or older	It has been at least 8 weeks since Dose 1	Give Dose 2 (Final Dose) today	No additional doses needed
			It has not been 8 weeks since Dose 1	No dose today	Give Dose 2 (Final Dose) at least 8 weeks after Dose 1
	2	Dose 1 was given before 12 months of age	It has been at least 8 weeks since Dose 2	Give Dose 3 (Final Dose) today	No additional doses needed
It has not been 8 weeks since Dose 2			No dose today	Give Dose 3 (Final Dose) at least 8 weeks after Dose 2	
2	Dose 1 was given at 12 months of age or older	→	No dose today	No additional doses needed	

¹ Refer to notes of the Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger – United States, 2019 for immunization guidance for children at increased risk for *Haemophilus influenzae* type b disease.

Reference: Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger – United States, 2019 www.cdc.gov/vaccines/schedules/downloads/child/0-18yrs-child-combined-schedule.pdf



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Catch-Up Guidance for Children 4 Months through 6 Years of Age

Diphtheria-, Tetanus-, and Pertussis-Containing Vaccines: DTaP/DT¹

The table below provides guidance for children whose vaccinations have been delayed. Start with the child's age and information on previous doses (previous doses must be documented and must meet minimum age requirements and minimum intervals between doses). Use this table in conjunction with table 2 of the Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger, found at www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html.

IF current age is	AND # of previous doses of DTaP or DT is	AND	THEN	Next dose due
4 months through 11 months	Unknown or 0	→	Give Dose 1 (DTaP) today	Give Dose 2 (DTaP) at least 4 weeks after Dose 1
	1	It has been at least 4 weeks since Dose 1	Give Dose 2 (DTaP) today	Give Dose 3 (DTaP) at least 4 weeks after Dose 2
		It has not been at least 4 weeks since Dose 1	No dose today	Give Dose 2 (DTaP) at least 4 weeks after Dose 1
	2	It has been at least 4 weeks since Dose 2	Give Dose 3 (DTaP) today	Give Dose 4 (DTaP) at least 6 calendar months after Dose 3 and at 15 months of age or older ²
It has not been at least 4 weeks since Dose 2		No dose today	Give Dose 3 (DTaP) at least 4 weeks after Dose 2	
1 through 3 years	Unknown or 0	→	Give Dose 1 (DTaP) today	Give Dose 2 (DTaP) at least 4 weeks after Dose 1
	1	It has been at least 4 weeks since Dose 1	Give Dose 2 (DTaP) today	Give Dose 3 (DTaP) at least 4 weeks after Dose 2
		It has not been at least 4 weeks since Dose 1	No dose today	Give Dose 2 (DTaP) at least 4 weeks after Dose 1
	2	It has been at least 4 weeks since Dose 2	Give Dose 3 (DTaP) today	Give Dose 4 (DTaP) at least 6 calendar months after Dose 3
		It has not been at least 4 weeks since Dose 2	No dose today	Give Dose 3 (DTaP) at least 4 weeks after Dose 2
	3	It has been at least 6 calendar months since Dose 3	If 12 through 14 months of age, no dose today ²	Give Dose 4 (DTaP) at 15 through 18 months of age
			If 15 months of age or older, give Dose 4 (DTaP) today	Give Dose 5 (DTaP) at least 6 months after Dose 4 and at 4 through 6 years of age
		It has not been 6 calendar months since Dose 3	No dose today	Give Dose 4 (DTaP) at least 6 months after Dose 3

¹Vaccine information: DTaP—Administer to children 6 weeks through 6 years of age without a contraindication or precaution to diphtheria, tetanus, or pertussis vaccine. DTaP products include Daptacel, Kinrix, Infanrix, Pediarix, Pentacel, and Quadacel. Use the correct product based on the approved age indications. DT—Administer to children 6 weeks through 6 years of age with a contraindication to pertussis vaccine.

²The fourth dose may be administered as early as age 12 months, provided at least 6 months have elapsed since the third dose.

Reference: Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger—United States, 2019. www.cdc.gov/vaccines/schedules/downloads/child/0-18yrs-child-combined-schedule.pdf



U.S. Department of Health and Human Services
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Catch-Up Guidance for Children 7 through 18 Years of Age

Tetanus-, Diphtheria-, and Pertussis-Containing Vaccines: Tdap/Td¹

The table below provides guidance for children whose vaccinations have been delayed. Start with the child's age and information on previous doses (previous doses must be documented and must meet minimum age requirements and minimum intervals between doses). Use this table in conjunction with table 2 of the Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger, found at www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html.

IF current age is	AND # of previous doses of DTaP, DT, Td, or Tdap is	AND ²	AND	AND ²	THEN	Next dose due
7 through 18 years of age ^{2,3}	Unknown or 0	→	→	→	Give Dose 1 (Tdap) today	Give Dose 2 (Td) at least 4 weeks after Dose 1
	1	Dose 1 was given before 12 months of age	→	→	Give Dose 2 (Tdap) today	Give Dose 3 (Td) at least 4 weeks after Dose 2
			It has been at least 4 weeks since Dose 1	Dose 1 was Tdap	Give Dose 2 (Td) today	Give Dose 3 (Td) at least 6 calendar months after Dose 2
		Dose 1 was given at 12 months of age or older	It has not been 4 weeks since Dose 1	Dose 1 was not Tdap	Give Dose 2 (Td) today	Give Dose 2 (Td) at least 4 weeks after Dose 1
	2	Dose 1 was given before 12 months of age	It has been at least 4 weeks since Dose 2	Any dose was Tdap ³	Give Dose 3 (Td) today	Give Dose 4 (Td) at least 6 calendar months after Dose 3
				No dose was Tdap	Give Dose 3 (Tdap) today	Give Dose 3 (Td) at least 4 weeks after Dose 2
			It has not been 4 weeks since Dose 2	Any dose was Tdap	No dose today	Give Dose 3 (Td) at least 4 weeks after Dose 2
		Dose 1 was given at 12 months of age or older	It has been at least 6 calendar months since Dose 2	Any dose was Tdap ³	Give Dose 3 (Td) today	Give Td in 10 years ³
				No dose was Tdap	Give Dose 3 (Tdap) today	
			It has not been 6 calendar months since Dose 2	Any dose was Tdap ³	No dose today	Give Dose 3 (Td) at least 6 calendar months after Dose 2 ⁴
No dose was Tdap	No dose today	Give Dose 3 (Tdap) at least 6 calendar months after Dose 2				

¹Vaccine information: Tdap—Administer to persons 7 years of age and older without a contraindication or precaution to tetanus-, diphtheria-, or pertussis-containing vaccine. Tdap products include Adacel and Boostrix. Td—Administer to persons 7 years of age and older previously vaccinated with Tdap or with a contraindication to pertussis vaccine.

²Tdap or Td given as doses 1–3 prior to 7 years of age should not be counted.

³For persons age 7–10 years who receive a dose of Tdap as part of the catch-up series, an adolescent Tdap vaccine dose should be administered at age 11–12 years. If Tdap is administered inadvertently, the Tdap dose should not be counted as valid. The adolescent Tdap dose should be administered as recommended when the child is age 11–12 years.

Reference: Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger—United States, 2019. www.cdc.gov/vaccines/schedules/downloads/child/0-18yrs-child-combined-schedule.pdf



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CDC Resources for Staff Education

- **Multiple education products available free through the CDC website:**
 - Immunization courses (webcasts and online self-study)
 - *You Call the Shots* self-study modules
- **Continuing education available**

Immunization Education & Training

[Education and Training Home](#)

- You Call The Shots
- Current Issues in Immunization NetConferences (CIINC)
- Immunization Courses +
- Continuing Education
- Pink Book Webinars

[<< Back to Vaccines Home](#)



CDC offers numerous education and training programs for healthcare personnel. A variety of topics and formats are available. All are based on vaccine recommendations made by the Advisory Committee on Immunization Practice (ACIP).

Physicians, nurses, health educators, pharmacists, and other healthcare professionals are invited to apply for continuing education credits/contact

Expert Commentary



Running Time: 5:07 mins
Date Released: 06/27/2011
[CDC Commentary - Make No Mistake: Vaccine Administration](#)

Current Issues in Immunization Netconferences (CIINC) and 2019 EpiVac Pink Book Webinars

- Provide clinicians with the most up-to-date information on immunizations
- Archived versions available
- Sign up for e-mail alerts at
 - www.cdc.gov/vaccines/ed/ciinc/index.html
 - www.cdc.gov/vaccines/ed/webinar-epv/index.html



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What's this?

Submit

Immunization Questions?

- Questions? E-mail CDC nipinfo@cdc.gov or www.cdc.gov/cdcinfo
- Vaccines and Immunizations website www.cdc.gov/vaccines
- HCP education www.cdc.gov/vaccines/hcp.htm
- Twitter [@DrNancyM_CDC](https://twitter.com/DrNancyM_CDC)
- Influenza www.cdc.gov/flu
- Vaccine safety www.cdc.gov/vaccinesafety

CDC Immunization Apps for Health Care Personnel



Childhood and adult immunization schedules

www.cdc.gov/vaccines/schedules/hcp/schedule-app.html



Influenza information

www.cdc.gov/flu/apps/cdc-influenza-hcp.html



Morbidity and Mortality Weekly Report (MMWR)

www.cdc.gov/mobile/applications/mobileframework/mmwrpromo.html



PneumoRecs VaxAdvisor

www.cdc.gov/vaccines/vpd/pneumo/hcp/pneumoapp.html

Additional Slides

FYI – PEP for Hepatitis A

- **PEP with HepA or IG is effective when administered within 2 weeks of exposure**
- **Persons 1–40y should receive HepA, persons >40y may also receive IG depending on risk**
- **Persons ≥ 1 y with immunocompromising conditions or chronic liver disease should receive HepA and IG at same time**
- **Completing 2-dose series HepA not necessary for PEP; however, for long-term immunity, second dose HepA should be administered ≥ 6 mos**