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NEEDLE TIPS

from the Immunization Action Coalition — www.immunize.org

What's In This Issue

New ACIP recommendations for HPV, influenza, MenB, typhoid, and yellow fever vaccines. Make sure you're up to date!

An abundance of new guidance has recently been issued for the use of vaccines by the Centers for Disease Control and Prevention's (CDC) Advisory Committee on Immunization Practices (ACIP) in 2015 and more will be published soon. The guidance covers the use of 9-valent human papillomavirus vaccine (9vHPV, Gardasil 9, Merck); meningococcal serotype B vaccines (MenB: Bexsero, GlaxoSmithKline; Trumenba, Pfizer); influenza vaccines, typhoid vaccines (Typhim Vi, Sanofi Pasteur; Vivotif, PaxVax) and yellow fever vaccine (YF, YF-VAX, Sanofi-Pasteur).

The following provides a brief summary of the recent changes voted upon at the February ACIP meeting, as well as recommendations recently published in *Morbidity and Mortality Weekly Report (MMWR)*.

Human papillomavirus vaccine

On March 27, *MMWR* published "Use of 9-Valent Human Papillomavirus (HPV) Vaccine: Updated HPV Vaccination Recommendations of the ACIP."

The new 9vHPV vaccine is recommended for use along with the other HPV vaccines already recommended for use by ACIP. The recommendations include HPV vaccination of all boys and girls at age 11 or 12 years, with HPV vaccine use recommended for females through age 26 and for males through age 21, as well as for men through age 26 who are immunocompromised or who have sex with men. For females, the 2-valent (2vHPV, Cervarix, GlaxoSmithKline), 4-valent (4vHPV, Gardasil, Merck), or 9-valent (9vHPV) HPV vaccines may be used. For males, either 4vHPV or 9vHPV should be administered. Any recommended HPV vaccine, including 9vHPV, may be used to complete a previously begun HPV vaccine series. Updated ACIP HPV recommendations are available online at www.cdc.gov/mmwr/pdf/wk/mm6411.pdf, pages 300–304.

Influenza vaccine

At its February meeting, ACIP voted to approve its annual influenza vaccine recommendations for the 2015–2016 influenza season. The committee reaffirmed the need for annual influenza vaccination for all people age 6 months and older. Based on new data, ACIP removed the previously recommended preference for the use of live attenuated influenza vaccine (LAIV, FluMist, AstraZeneca) in children age 2 through 8 years, noting

Recommendations… *continued on page 5* ▶

Ask the Experts

The Immunization Action Coalition extends thanks to our experts, medical officer Andrew T. Kroger, MD, MPH, and nurse educator Donna L. Weaver, RN, MN, both with the National Center for Immunization and Respiratory Diseases at the Centers for Disease Control and Prevention (CDC).

HPV vaccine

Which types of HPV are most likely to cause disease?

Of the annual average of 26,900 HPV-related cancers in the United States, approximately 64% are attributable to HPV 16 or 18 (65% for females; 63% for males; approximately 21,300 cases annually), which are included in all three HPV vaccines. Approximately 10% are attributable to HPV types 31, 33, 45, 52, and 58 (14% for females; 4% for males; approximately 3,400 cases annually), which are included in the 9-valent HPV vaccine. HPV type 16, 18, 31, 33, 45, 52, or 58 account for about 81% of cervical cancers in the United States.

Approximately 50% of cervical precancers (CIN2 or greater) are caused by HPV 16 or 18 and 25% by HPV 31, 33, 45, 52, or 58. HPV 6 or 11 cause 90% of anogenital warts (condylomata) and most cases of recurrent respiratory papillomatosis.

More information about HPV and HPV-related cancers is available in the 2014 HPV ACIP statement at www.cdc.gov/mmwr/pdf/rr/rr6305.pdf.

Are healthcare personnel at risk of occupational infection with HPV?

Occupational infection with HPV is possible. Some HPV-associated conditions (including anogenital and oral warts, anogenital intraepithelial neoplasias, and recurrent respiratory papillomatosis) are treated with laser or electrosurgical procedures that could produce airborne particles. These procedures should be performed in an appropriately ventilated room using standard precautions and local exhaust ventilation. Workers in HPV research laboratories who handle wild-type virus or "quasi virions" might be at risk of acquiring HPV from occupational exposures. In

Ask the Experts… *continued on page 22* ▶

Immunization questions?

- ▶ Email nipinfo@cdc.gov
- ▶ Call your state health department (phone numbers at www.immunize.org/coordinators)

Needle Tips

online at www.immunize.org/nt

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IAC publishes a free email news service *(IAC Express)* and two free periodicals *(Needle Tips* and *Vaccinate Adults)*. To subscribe, go to www.immunize.org/subscribe.

IAC, a 501(c)(3) charitable organization, publishes practical immunization information for health professionals to help increase immunization rates and prevent disease.

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IAC maintains strict editorial independence in its publications.

Need help responding to vaccine-hesitant parents? Visit IAC's redesigned "Talking About Vaccines" web section for practical tips and key resources!

According to a recent study published in the journal *Pediatrics*, virtually all providers receive requests to spread out the vaccine schedule in a typical month.[1] In medical practices across the nation, healthcare professionals (HCP) are called upon to attest to the safety of vaccines, the importance of vaccination, and the potentially grave consequences of not vaccinating. With appreciation for the challenges facing busy HCP, IAC has redesigned its "Talking About Vaccines" web section (www.immunize.org/talking-about-vaccines) to provide HCP with background information and practical resources that will help them efficiently and easily discuss immunization with parents and patients.

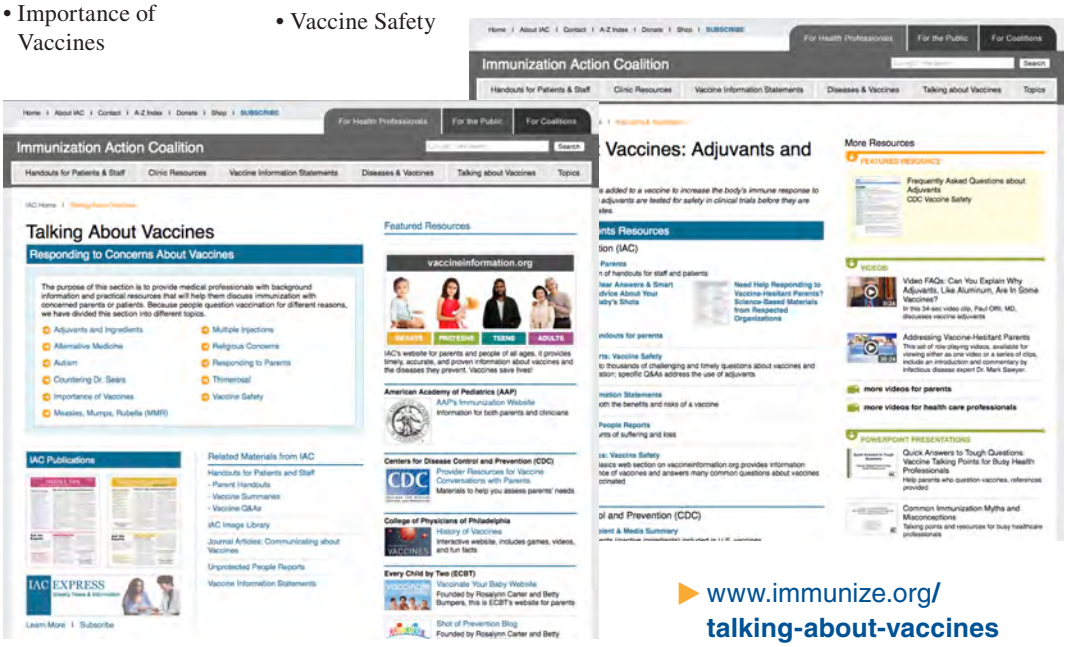
"Talking About Vaccines" includes the following specific topics:

- Adjuvants and Ingredients
- Alternative Medicine
- Autism
- Countering Dr. Sears
- Importance of Vaccines
- MMR
- Religious Concerns
- Responding to Parents
- Thimerosal
- Too Many Vaccines?
- Vaccine Safety

The updated web section gathers a curated collection of educational print materials, videos, podcasts, blogs, journal articles, PowerPoint presentations, websites, and more, from many trusted sources such as the Immunization Action Coalition, Centers for Disease Control and Prevention, American Academy of Pediatrics, Every Child By Two, Institute of Medicine, and Vaccine Education Center at Children's Hospital of Philadelphia. Please visit often!

We also recommend you subscribe to our weekly email news service, *IAC Express*, if you're not already on our e-mail list of 50,000 recipients. It's free! Once you complete the sign-up form at www.immunize.org/subscribe, you'll start receiving email announcements every Tuesday about important developments related to immunization.

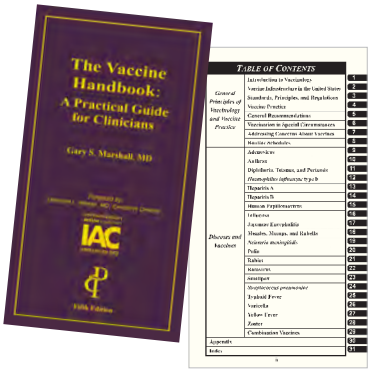
[1] Kempe A, O'Leary ST, Kennedy A, et al. Physician Response to Parental Requests to Spread Out the Recommended Vaccine Schedule. *Pediatrics*, April 2015;135(4): 666–677.



▶ www.immunize.org/talking-about-vaccines

Subscribe to *IAC Express*, the Immunization Action Coalition's e-news and information service at www.immunize.org/subscribe

The Vaccine Handbook: A Practical Guide for Clinicians ("The Purple Book") by Gary Marshall, MD



NEW! Fifth edition extensively updated for 2015

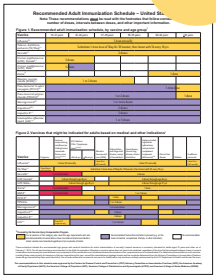
Purchase *The Vaccine Handbook* (560 pages) from IAC at www.immunize.org/vaccine-handbook.

$29.95 + shipping • Discount pricing available!

Laminated child and adult immunization schedules Order one of each for every exam room

2015

The 2015 versions of the ACIP/AAP/AAFP-approved immunization schedule for people ages 0 through 18 years (8-sided) and the ACIP/AAFP/ACOG/ACNM-approved schedule for adults (6-sided). Both are laminated and washable for heavy-duty use, complete with essential footnotes, and printed in color for easy reading.



▶ To order, visit www.immunize.org/shop, or use the order form on page 24.

Quantity discounts are available.

Schedules: $7.50 each

Wallet-sized immunization record cards for all ages: For children and teens, for adults, and for a lifetime!

Record Cards: $45/box

Now you can give any patient a permanent vaccination record card designed specifically for their age group: child and teen, adult, or lifetime. These brightly colored cards are printed on durable rip-, smudge-, and water-proof paper. Each box contains 250 cards.

▶ To order, visit www.immunize.org/shop, or use the order form on page 24.

Quantity discounts are available. To receive sample cards, contact us: admininfo@immunize.org

Training Video: "Immunization Techniques – Best Practices with Infants, Children, and Adults"

DVD: $17 each

The California Department of Public Health, Immunization Branch, updated its award-winning training video, "Immunization Techniques: Best Practices with Infants, Children, and Adults." The 25-minute DVD can be used to train new employees and to refresh the skills of experienced staff on administering injectable, oral, and nasal-spray vaccines to children, teens, and adults.

▶ To order, visit www.immunize.org/shop, or use the order form on page 24.

For healthcare settings in California, contact your local health department immunization program for a free copy.

Vaccine Highlights

Recommendations, schedules, and more

Editor's note: The information in Vaccine Highlights is current as of May 15, 2015.

Next ACIP meetings

The Advisory Committee on Immunization Practices (ACIP) is comprised of 15 national experts who advise CDC on the appropriate use of vaccines. ACIP meets three times a year in Atlanta; meetings are open to the public and available online via live webcast. The next meetings will be held on June 24–25 and October 21–22. For more information, visit www.cdc.gov/vaccines/acip. ACIP periodically issues recommendations on the use of vaccines; they are published and readily available in the *Morbidity and Mortality Weekly Report (MMWR)*. Clinicians who vaccinate should have a current set for reference. Here are sources:

- Download from IAC's website: www.immunize.org/acip
- Download from CDC's website: www.cdc.gov/vaccines/hcp/acip-recs

In addition, extensive information on ACIP meetings is available at www.cdc.gov/vaccines/acip/meetings/meetings-info.html.

For details about the vaccine recommendations voted upon by ACIP at its February 26 meeting, see the lead story on page 1.

HPV vaccine news

On March 27, CDC published "Use of 9-Valent Human Papillomavirus (HPV) Vaccine: Updated HPV Vaccination Recommendations of the ACIP" in *MMWR*. The new 9-valent HPV vaccine (9vHPV, Gardasil 9, Merck) is recommended for use along with the other HPV vaccines already recommended for use by ACIP. Access the recommendations at www.cdc.gov/mmwr/pdf/wk/mm6411.pdf, pages 300–304. A new VIS for 9vHPV was released on April 15.

Influenza vaccine news

At its February meeting, ACIP voted to approve its annual influenza vaccine recommendations for the 2015–2016 influenza season. The committee reaffirmed the need for annual influenza vaccination for all people age 6 months and older. Based on new data, ACIP removed the previously recommended preference for the use of live attenuated influenza vaccine (LAIV, FluMist, AstraZeneca) in children age 2 through 8 years, noting that both LAIV and inactivated influenza vaccine (IIV) are equally acceptable to use in this age group. Access a related CDC press release at www.cdc.gov/media/releases/2015/s0226-acip.html.

Typhoid vaccine news

On March 27, CDC published "Updated Recommendations for the Use of Typhoid Vaccine – ACIP, U.S., 2015" in *MMWR*. Access the recommendations at www.cdc.gov/mmwr/pdf/wk/mm6411.pdf, pages 305–308.

VIS news

Since February 24, CDC has released six new or updated Vaccine Information Statements (VISs):

- *Haemophilus influenzae* type b (Hib) VIS, April 2, 2015
- Gardasil 9 VIS, April 15, 2015
- Pneumococcal Polysaccharide (PPSV23) VIS, April 24, 2015
- Rotavirus VIS, dated April 15, 2015
- Td VIS, dated February 24, 2015
- Tdap VIS, dated February 24, 2015

For all VISs in up to 40 languages, visit www.immunize.org/vis.

FDA news

On March 24, the Food and Drug Administration (FDA) announced the approval of Quadracel (Sanofi Pasteur), a DTaP-IPV combination vaccine. A single dose of Quadracel is approved for use in children age 4 through 6 years as a fifth dose in the diphtheria, tetanus, pertussis vaccination (DTaP) series, and as a fourth or fifth dose in the inactivated poliovirus vaccination (IPV) series, in children who have received 4 doses of Pentacel (DTaP-IPV-Hib, Sanofi) and/or Daptacel (DTaP-IPV, Sanofi) vaccine. Additional information about Quadracel is available on FDA's website at www.fda.gov/BiologicsBloodVaccines/Vaccines/ApprovedProducts/ucm439856.htm.

Measles news

On April 17, CDC published a report on measles in the U.S. from January 4 to April 2 in *MMWR* . According to CDC, more than 80% of measles cases occurred among people who were unvaccinated/unknown status. Access the article at www.cdc.gov/mmwr/pdf/wk/mm6414.pdf, pages 373–376.

Rotavirus news

On April 10, CDC published "Sustained Decrease in Laboratory Detection of Rotavirus after Implementation of Routine Vaccination—United States, 2000–2014" in *MMWR* (pages 337–342). Access the article at www.cdc.gov/mmwr/pdf/wk/mm6413.pdf, pages 337–342.

Vaccine error news

On March 26, 2015, the Institute for Safe Medication Practices (ISMP) published an article titled "Recommendations for Practitioners to Prevent Vaccine Errors Part 2: Analysis of ISMP Vaccine Errors Reporting Program." Access the report at www.ismp.org/newsletters/acutecare/showarticle.aspx?id=104.

Current VIS dates

Check the dates on your supply of Vaccine Information Statements (VISs). If any are outdated, get current versions and VISs in more than 30 languages at www.immunize.org/vis.

Adenovirus	6/11/14	MMRV	5/21/10
Anthrax	3/10/10	Meningococcal	10/14/11
Chickenpox	3/13/08	Multi-vaccine	10/22/14
DTaP	5/17/07	PCV13	2/27/13
Hib	4/2/15	PPSV	4/24/15
Hepatitis A	10/25/11	Polio	11/8/11
Hepatitis B	2/2/12	Rabies	10/6/09
HPV-Cervarix	5/3/11	Rotavirus	4/15/15
HPV-Gardasil	5/17/13	Shingles	10/6/09
HPV-Gardasil 9	4/15/15	Td	2/24/15
Influenza	8/19/14	Tdap	2/24/15
Japanese enceph	1/24/14	Typhoid	5/29/12
MMR	4/20/12	Yellow fever	3/30/11

For a ready-to-print version of this table for posting in your practice, go to www.immunize.org/catg.d/p2029.pdf.

Recommendations… *continued from page 1*

that both LAIV and inactivated influenza vaccine (IIV) are equally acceptable to use in this age group. Access a related CDC press release at www.cdc.gov/media/releases/2015/s0226-acip.html.

Meningococcal B vaccine

Also in February, ACIP voted that a series of either of the recently licensed MenB vaccines should be administered to people 10 years of age and older who are at increased risk of meningococcal disease. These individuals include:

- People with persistent complement component deficiencies, including inherited or chronic deficiencies in C3, C5-9, properdin, factor D, factor H, or taking eculizumab;
- People with anatomic or functional asplenia, including sickle cell disease;
- Microbiologists routinely exposed to isolates of *Neisseria meningitidis*; and
- People identified to be at increased risk because of a meningococcal B outbreak.

No preference was stated on the use of one MenB vaccine over the other.

ACIP delayed its discussion about the use of MenB vaccine in adolescents and college students until the June meeting.

Typhoid vaccine

On March 27, CDC published "Updated Recommendations for the Use of Typhoid Vaccine – ACIP, U.S., 2015" in *MMWR* (www.cdc.gov/mmwr/pdf/wk/mm6411.pdf, pages 305–308).

These revised ACIP recommendations include updated information on the two currently available typhoid vaccines and on vaccine safety. Routine typhoid vaccination is not recommended in the U.S. The vaccine is recommended for international travelers to specific areas, as well as for those who are routinely exposed to *Salmonella* serotype Typhi (i.e., microbiologists/laboratory workers and intimate contacts of documented chronic carriers).

Yellow fever vaccine

ACIP voted to recommend that a single dose of yellow fever (YF) vaccine provides long-lasting protection and is adequate for most travelers. ACIP also stated that additional doses of YF vaccine may be indicated for certain populations. A booster dose of YF vaccine may be considered for travelers who received their last dose at least 10 years previously and who will be in a higher-risk setting based on season, location, activities, and duration of their travel. For more details, see IAC's ACIP meeting summary in "Technically Speaking," April 2015, www.immunize.org/technically-speaking/20150401.asp.

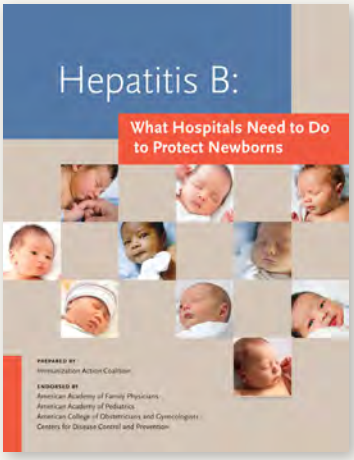
Apply for IAC's Influenza Vaccination Honor Roll

Join more than 500 healthcare settings already honored!

This honor roll recognizes healthcare settings that have implemented mandatory vaccination policies for healthcare personnel (HCP).

To find the healthcare settings listed by state, visit www.immunize.org/honor-roll/influenza-mandates/honorees.asp

To read position statements supporting mandatory HCP vaccination from leading healthcare organizations and professional medical societies or to apply, visit www.immunize.org/honor-roll/influenza-mandates



IAC'S COMPLETE GUIDE

Hepatitis B: What Hospitals Need to Do to Protect Newborns

is a complete resource to help birthing institutions establish, implement, and optimize their birth dose policies.

Endorsed by AAFP, AAP, ACOG, and CDC, IAC's e-book breaks new ground as a policy and best practice guide for newborn hepatitis B immunization.

DOWNLOAD THE GUIDE AT www.immunize.org/protect-newborns

Apply for IAC's Hepatitis B Birth Dose Honor Roll

Join nearly 200 hospitals already honored!

This honor roll recognizes hospitals and birthing centers that have attained high coverage rates for administering hepatitis B vaccine at birth.

To find hospitals listed by state, visit www.immunize.org/honor-roll/birthdose/honorees.asp

To find out more about the birth dose honor roll, visit www.immunize.org/honor-roll/birthdose

To apply, visit www.immunize.org/honor-roll/birthdose/apply.aspx

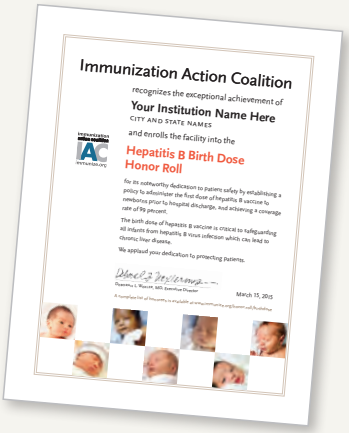
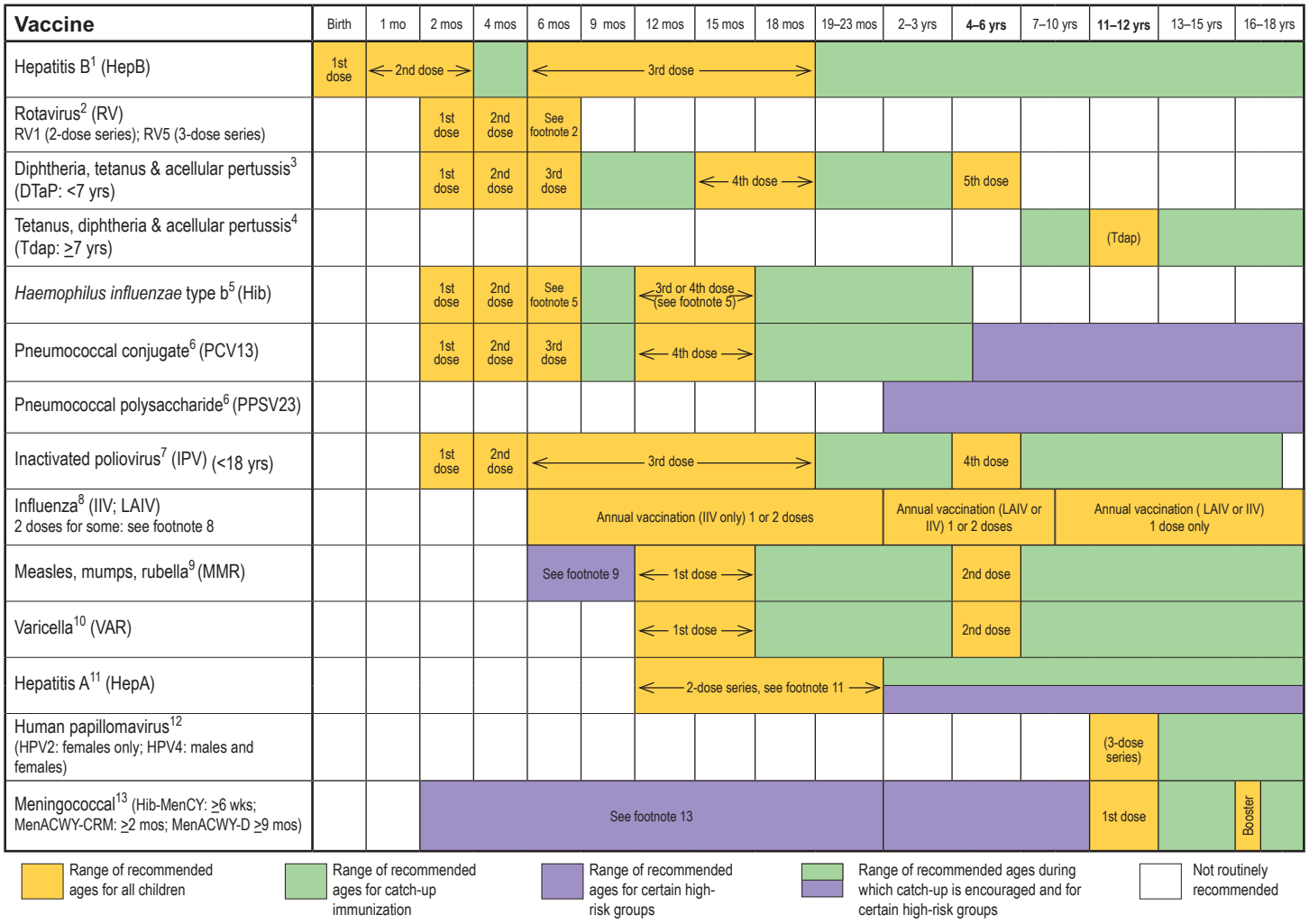


Figure 1. Recommended Immunization Schedule for Persons Ages 0 through 18 Years, United States, 2015

These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1. To determine minimum intervals between doses, see the catch-up schedule (Figure 2). School entry and adolescent vaccine age groups are in bold.



This schedule includes recommendations in effect as of January 1, 2015. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Vaccination providers should consult the relevant Advisory Committee on Immunization Practices (ACIP) statement for detailed recommendations, available online at www.cdc.gov/vaccines/hcp/acip-recs/index.html. Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online (www.vaers.hhs.gov) or by telephone (800-822-7967). Suspected cases of vaccine-preventable diseases should be reported to the state or local health department. Additional information, including precautions and contraindications for vaccination, is available from CDC online (www.cdc.gov/vaccines/recs/vac-admin/contraindications.htm) or by telephone (800-CDC-INFO [800-232-4636]).

Additional Vaccine Information

- For contraindications and precautions to use of a vaccine and for additional information regarding that vaccine, vaccination providers should consult the relevant ACIP statement available online at www.cdc.gov/vaccines/hcp/acip-recs/index.html.
- For the purposes of calculating intervals between doses, 4 weeks = 28 days. Intervals of 4 months or greater are determined by calendar months.
- Vaccine doses administered 4 days or less before the minimum interval are considered valid. Doses of any vaccine administered ≥5 days earlier than the minimum interval or minimum age should not be counted as valid doses and should be repeated as age appropriate. The repeat dose should be spaced after the invalid dose by the recommended minimum interval. For further details, see *MMWR,* General Recommendations on Immunization and Reports/Vol.60/No.2; Table 1. *Recommended and minimum ages and intervals between vaccine doses* available on-line at www.cdc.gov/mmwr/pdf/rr/rr6002.pdf.
- Information on travel vaccine requirements and recommendations is available at wwwnc.cdc.gov/travel/destinations/list.
- For vaccination of persons with primary and secondary immunodeficiencies, see Table 13, "Vaccination of persons with primary and secondary immunodeficiencies," in General Recommendations on Immunization (ACIP), available at www.cdc.gov/mmwr/pdf/rr/rr6002.pdf; and American Academy of Pediatrics. Immunization in Special Clinical Circumstances, in: Pickering LK, Baker CJ, Kimberlin DW, Long SS, eds. *Red Book: 2012 Report of the Committee on Infectious Disease.* 29th ed. Elk Grove Village, IL: American Academy of Pediatrics.

This schedule is approved by the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/acip), the American Academy of Pediatrics (www.aap.org), the American Academy of Family Physicians (www.aafp.org), and the American College of Obstetricians and Gynecologists (www.acog.org).

Figure 2. Catch-up Immunization Schedule for Persons Ages 4 Months through 18 Years Who Start Late or Who Are More Than 1 Month Behind, United States, 2015

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 Figure 2 in conjunction with Figure 1 and the footnotes that follow.

Children ages 4 months through 6 years					
Vaccine	**Minimum Age for dose 1**	**Minimum Interval Between Doses**			
		Dose 1 to dose 2	**Dose 2 to dose 3**	**Dose 3 to dose 4**	**Dose 4 to dose 5**
Hepatitis B[1]	Birth	4 weeks	8 weeks *and* at least 16 weeks after first dose. Minimum age for the final dose is 24 wks.		
Rotavirus[2]	6 wks	4 weeks	4 weeks[2]		
Diphtheria, tetanus, and acellular pertussis[3]	6 wks	4 weeks	4 weeks	6 months	6 months[3]
***Haemophilus influenzae* type b**[5]	6 wks	**4 weeks** if first dose was administered before the 1st birthday **8 weeks (as final dose)** if first dose was administered at age 12 through 14 months **No further doses needed** if first dose was administered at age 15 months or older	**4 weeks**[5] if current age is younger than 12 mos **and** first dose was administered at younger than age 7 mos, **and** at least 1 previous dose was PRP-T (ActHib, Penacel) or unknown. **8 weeks *and* age 12 through 59 mos (as final dose)**[5] • if current age is younger than 12 mos **and** first dose was administered at age 7 through 11 months; **or** • if current age is 12 through 59 months **and** first dose was administered before the 1st birthday, **and** second dose administered at younger than 15 months; **or** • if both doses were PRP-OMP (PedvaxHIB; Comvax) **and** were administered before the 1st birthday. **No further doses needed** if previous dose was administered at age 15 mos or older.	**8 weeks (as final dose)** This dose only necessary for children ages 12 through 59 months who received 3 doses before the 1st birthday	
Pneumococcal[6]	6 wks	**4 weeks** if first administered before the 1st birthday. **8 weeks (as final dose for healthy children)** if first was administered on or after the 1st birthday. **No further doses needed** for healthy children if first dose administered at age 24 mos or older.	**4 weeks** if current age is younger than 12 months and previous dose administered before age 7 months. **8 weeks (as final dose for healthy children)** • if previous dose given at 7 through 11 months (wait until at least age 12 months) or • if current age is 12 months or older and at least 1 dose was given before age 12 months. **No further doses needed** for healthy children if previous dose administered at age 24 months or older.	**8 weeks (as final dose)** This dose only necessary for children ages 12 through 59 mos who received 3 doses before age 12 mos or for children at high risk who received 3 doses at any age.	
Inactivated poliovirus[7]	6 wks	4 weeks[7]	4 weeks[7]	6 months[7] (minimum age 4 years for final dose)	
Meningococcal[13]	6 wks	8 weeks[13]	see footnote 13	see footnote 13	
Measles, mumps, rubella[9]	12 mos	4 weeks			
Varicella[10]	12 mos	3 months			
Hepatitis A[11]	12 mos	6 months			
Children and adolescents ages 7 through 18 years					
Tetanus, diphtheria; tetanus, diphtheria, and acellular pertussis[4]	7 yrs[4]	4 weeks	**4 weeks** if first dose of DTaP/DT was administered before the 1st birthday **6 months (as final dose)** if first dose of DTaP/DT was administered at age 12 mos or older	**6 months** if first dose of DTaP/DT was administered before the 1st birthday	
Human papillomavirus[12]	9 yrs	**Routine dosing intervals are recommended**[12]			
Hepatitis A[11]	Not applicable (N/A)	6 months			
Hepatitis B[1]	N/A	4 weeks	**8 weeks** and at least 16 wks after first dose		
Inactivated poliovirus[7]	N/A	4 weeks	4 weeks[7]	6 months[7]	
Meningococcal[13]	N/A	8 weeks[13]			
Measles, mumps, rubella[9]	N/A	4 weeks			
Varicella[10]	N/A	**3 months** if person is younger than age 13 yrs **4 weeks** if person is age 13 yrs or older			

(continued)

Footnotes: Recommended Immunization Schedule for Persons Ages 0 through 18 Years, United States, 2015

For further guidance on the use of the vaccines mentioned below, see www.cdc.gov/vaccines/hcp/acip-recs/index.html.
For vaccine recommendations for persons age 19 years and older, see the Recommended Adult Immunization Schedule.

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

Routine vaccination:

At birth:

- Administer monovalent HepB to all newborns before hospital discharge.
- For infants born to hepatitis B surface antigen (HBsAg)-positive mothers, administer HepB vaccine and 0.5 mL of hepatitis B immune globulin (HBIG) within 12 hours of birth. These infants should be tested for HBsAg and antibody to HBsAg (anti-HBs) 1 to 2 months after completion of the HepB series at age 9 through 18 months (preferably at the next well-child visit).
- If mother's HBsAg status is unknown, within 12 hours of birth administer HepB vaccine regardless of birth weight. For infants weighing less than 2,000 grams, administer HBIG in addition to HepB vaccine within 12 hours of birth. Determine mother's HBsAg status as soon as possible and, if mother is HBsAg positive, also administer HBIG for infants weighing 2,000 grams or more as soon as possible, but no later than age 7 days.

Doses following the birth dose:

- The second dose should be administered at age 1 or 2 months. Monovalent HepB vaccine should be used for doses administered before age 6 weeks.
- Infants who did not receive a birth dose should receive 3 doses of a HepB-containing vaccine on a schedule of 0, 1 to 2 months, and 6 months starting as soon as feasible (see Figure 2).
- Administer the second dose 1 to 2 months after the first dose (minimum interval of 4 weeks), administer the third dose at least 8 weeks after the second dose and at least 16 weeks after the first dose. The final (third or fourth) dose in the HepB vaccine series should be administered no earlier than age 24 weeks.
- Administration of a total of 4 doses of HepB vaccine is permitted when a combination vaccine containing HepB is administered after the birth dose.

Catch-up vaccination:

- Unvaccinated persons should complete a 3-dose series.
- A 2-dose series (doses separated by at least 4 months) of adult formulation Recombivax HB is licensed for use in children age 11 through 15 years.
- For other catch-up guidance, see Figure 2.

2. Rotavirus (RV) vaccines. (Minimum age: 6 weeks for both RV1 [Rotarix] and RV5 [RotaTeq])

Routine vaccination:

- Administer a series of RV vaccine to all infants as follows:
  1. If Rotarix is used, administer a 2-dose series at ages 2 and 4 months;
  2. If RotaTeq is used, administer a 3-dose series at ages 2, 4, and 6 months;
  3. If any dose in series was RotaTeq or vaccine product is unknown for any dose in the series, a total of 3 doses of RV vaccine should be administered.

Catch-up vaccination:

- The maximum age for the first dose in the series is 14 weeks, 6 days; vaccination should not be initiated for infants ages 15 weeks 0 days or older.
- The maximum age for the final dose in the series is 8 months, 0 days.
- For other catch-up guidance, see Figure 2.

3. Diphtheria and tetanus toxoids and acellular pertussis (DTaP) vaccine. (Minimum age: 6 weeks. Exception: DTaP-IPV [Kinrix]: 4 years)

Routine vaccination:

- Administer a 5-dose series of DTaP vaccine at ages 2, 4, 6, 15 through 18 months, and 4 through 6 years. The fourth dose may be administered as early as age 12 months, provided at least 6 months have elapsed since the third dose. However, the fourth dose of DTaP need not be repeated if it was administered at least 4 months after the third dose of DTaP.

Catch-up vaccination:

- The fifth dose of DTaP is not necessary if the fourth dose was administered at age 4 years or older.
- For other catch-up guidance, see Figure 2.

4. Tetanus and diphtheria toxoids and acellular pertussis (Tdap) vaccine. (Minimum age: 10 years for both Boostrix and Adacel).

Routine vaccination:

- Administer 1 dose of Tdap vaccine to all adolescents ages 11 through 12 years.
- Tdap may be administered regardless of the interval since the last tetanus and diphtheria toxoid-containing vaccine.
- Administer 1 dose of Tdap vaccine to pregnant adolescents during each pregnancy (preferred during 27 through 36 weeks' gestation) regardless of time since prior Td or Tdap vaccination.

Catch-up vaccination:

- Persons ages 7 years and older who are not fully immunized with DTaP vaccine should receive Tdap vaccine as 1 dose (preferably the first) in the catch-up series; if additional doses are needed, use Td vaccine. For children age 7 through 10 years who receive a dose of Tdap as part of their catch-up series, an adolescent Tdap vaccine dose at age 11 through 12 years should not be administered. Td should be administered instead 10 years after the Tdap dose.
- Persons ages 11 through 18 years who have not received Tdap vaccine should receive a dose followed by tetanus and diphtheria (Td) booster doses every 10 years thereafter.
- Inadvertent doses of DTaP vaccine: 1) If administered inadvertently to a child ages 7 through 10 years, the dose may count as part of the catch-up series. This dose may count as the adolescent Tdap dose, or the child can later receive a Tdap booster dose at age 11 through 12 years. 2) If administered inadvertently to an adolescent ages 11 through 18 years, the dose should be counted as the adolescent Tdap booster.
- For other catch-up guidance, see Figure 2.

5. *Haemophilus influenzae* type b (Hib) conjugate vaccine. (Minimum age: 6 weeks for PRP-T [ActHIB, DTaP-IPV/Hib (Pentacel) and Hib-MenCY (MenHibrix)], PRP-OMP [PedvaxHIB or COMVAX],12 months for PRP-T [Hiberix])

Routine vaccination:

- Administer a 2- or 3-dose Hib vaccine primary series and a booster dose (dose 3 or 4, depending on vaccine used in primary series) at age 12 through 15 months to complete a full Hib vaccine series.
- The primary series with ActHIB, MenHibrix or Pentacel consists of 3 doses and should be administered at ages 2, 4, and 6 months. The primary series with PedvaxHib or COMVAX consists of 2 doses and should be administered at ages 2 and 4 months; a dose at age 6 months is not indicated.
- One booster dose (dose 3 or 4, depending on the vaccine used in primary series) of any Hib vaccine should be administered at age 12 through 15 months. An exception is Hiberix vaccine. Hiberix should only be used for the booster (final) dose in children ages 12 months through 4 years who have received at least 1 prior dose of Hib-containing vaccine.
- For recommendations on the use of MenHibrix in patients at increased risk for meningococcal disease, refer to the meningococcal vaccine footnote and also to *MMWR* February 28, 2014; 62 (RR01):1–13, available at www.cdc.gov/mmwr/pdf/rr/rr6301.pdf.

Catch-up vaccination:

- If dose 1 was administered at ages 12 through 14 months, administer a second (final) dose at least 8 weeks after dose 1, regardless of Hib vaccine used in the primary series.
- If the first 2 doses were PRP-OMP (PedvaxHIB or COMVAX), and were administered before the first birthday, the third (and final) dose at age 12 through 15 months or 8 weeks after second dose.
- If the first dose was administered at age 7 through 11 months, administer the second dose at least 4 weeks later and a third (and final) dose at age 12 through 15 months or 8 weeks after the second dose, whichever is later.
- If the first dose was administered before the first birthday and second dose administered at younger than 15 months, a third (and final) dose should be administered 8 weeks later.
- For unvaccinated children ages 15 months or older, administer only 1 dose.
- For other catch-up guidance, see Figure 2. For catch-up guidance related to MenHibrix, refer to the meningococcal vaccine footnotes and also *MMWR* March 22, 2013; 62 (RR02):1–22, available at www.cdc.gov/mmwr/pdf/rr/rr6202.pdf.

Vaccination of persons with high-risk conditions:

- Children ages 12 through 59 months who are at increased risk for Hib disease, including chemotherapy recipients and those with anatomic or functional asplenia (including sickle cell disease), human immunodeficiency virus (HIV) infection, immunoglobulin deficiency, or early component complement deficiency, who have received either no doses or only 1 dose of Hib vaccine before age 12 months, should receive 2 additional doses of Hib vaccine 8 weeks apart; children who received 2 or more doses of Hib vaccine before age 12 months should receive 1 additional dose.
- For patients younger than age 5 years undergoing chemotherapy or radiation treatment who received a Hib vaccine dose(s) within 14 days of starting therapy or during therapy, repeat the dose(s) at least 3 months following therapy completion.
- Recipients of hematopoietic stem cell transplant (HSCT) should be revaccinated with a 3-dose regimen of Hib vaccine starting 6 to 12 months after successful transplant, regardless of vaccination history; doses should be administered at least 4 weeks apart.
- A single dose of any Hib-containing vaccine should be administered to unimmunized* children and adolescents age 15 months and older undergoing an elective splenectomy; if possible, vaccine should be administered at least 14 days before procedure.
- Hib vaccine is not routinely recommended for patients ages 5 years or older. However, 1 dose of Hib vaccine should be administered to unimmunized* persons ages 5 years or older who have anatomic or functional asplenia (including sickle cell disease) and unimmunized* persons ages 5 through 18 years with HIV infection.

**Patients who have not received a primary series and booster dose or at least 1 dose of Hib vaccine after 14 months of age are considered unimmunized.*

6. Pneumococcal vaccines. (Minimum age: 6 weeks for PCV13, 2 years for PPSV23)

Routine vaccination with PCV13:

- Administer a 4-dose series of PCV13 vaccine at ages 2, 4, and 6 months and at age 12 through15 months.
- For children ages 14 through 59 months who have received an age-appropriate series of 7-valent PCV (PCV7), administer a single supplemental dose of 13-valent PCV (PCV13).

Catch-up vaccination:

- Administer 1 dose of PCV13 to all healthy children ages 24 through 59 months who are not completely vaccinated for their age.
- For other catch-up guidance, see Figure 2.

Vaccination of persons with high-risk conditions with PCV13 and PPSV23:

- All recommended PCV13 doses should be administered prior to PPSV23 vaccination if possible.
- For children ages 2 through 5 years with any of the following conditions: chronic heart disease (particularly cyanotic congenital heart disease and cardiac failure); chronic lung disease (including asthma if treated with high-dose oral corticosteroid therapy); diabetes mellitus; cerebrospinal fluid leak; cochlear implant; sickle cell disease and other hemoglobinopathies; anatomic or functional asplenia; HIV infection; chronic renal failure; nephrotic syndrome; diseases associated with treatment with immunosuppressive drugs or radiation therapy, including malignant neoplasms, leukemias, lymphomas, and Hodgkin's disease; solid organ transplantation; or congenital immunodeficiency:
  1. Administer 1 dose of PCV13 if any incomplete schedule of 3 doses of PCV (PCV7 and/or PCV13) were received previously.
  2. Administer 2 doses of PCV13 at least 8 weeks apart if unvaccinated or any incomplete schedule of fewer than 3 doses of PCV (PCV7 and/or PCV13) were received previously.

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3. Administer 1 supplemental dose of PCV13 if 4 doses of PCV7 or other age-appropriate complete PCV7 series was received previously.
4. The minimum interval between doses of PCV (PCV7 or PCV13) is 8 weeks.
5. For children with no history of PPSV23 vaccination, administer PPSV23 at least 8 weeks after the most recent dose of PCV13.

- For children ages 6 through 18 years who have cerebrospinal fluid leak; cochlear implant; sickle cell disease and other hemoglobinopathies; anatomic or functional asplenia; congenital or acquired immunodeficiencies; HIV infection; chronic renal failure; nephrotic syndrome; diseases associated with treatment with immunosuppressive drugs or radiation therapy, including malignant neoplasms, leukemias, lymphomas, and Hodgkin's disease; generalized malignancy; solid organ transplantation; or multiple myeloma:
  1. If neither PCV13 nor PPSV23 has been received preciously, administer 1 dose of PCV13 now and 1 dose of PPSV23 at least 8 weeks later.
  2. If PCV13 has been received previously but PPSV23 has not, administer 1 dose of PPSV23 at least 8 weeks after the most recent dose of PCV13.
  3. If PPSV23 has been received but PCV13 has not, administer 1 dose of PCV13 at least 8 weeks after the most recent dose of PPSV23.
- For children ages 6 through 18 years with chronic heart disease (particularly cyanotic congenital heart disease and cardiac failure), chronic lung disease (including asthma if treated with high-dose oral corticosteroid therapy), diabetes melliltus, alcoholism, or chronic liver disease, who have not received PPSV23, administer 1 dose of PPSV23. If PCV13 has been received previously, then PPSV23 should be administered at least 8 weeks after any prior PCV13 dose.
- A single revaccination with PPSV23 should be administered 5 years after the first dose to children with sickle cell disease or other hemoglobinopathies; anatomic or functional asplenia; congenital or acquired immunodeficiencies; HIV infection; chronic renal failure; nephrotic syndrome; diseases associated with treatment with immunosuppressive drugs or radiation therapy, including malignant neoplasms, leukemias, lymphomas, and Hodgkin's disease; generalized malignancy; solid organ transplantation; or multiple myeloma.

7. Inactivated poliovirus vaccine (IPV). (Minimum age: 6 weeks)

Routine vaccination:

- Administer a 4-dose series of IPV at ages 2, 4, 6 through 18 months, and 4 through 6 years. The final dose in the series should be administered on or after the fourth birthday and at least 6 months after the previous dose.

Catch-up vaccination:

- In the first 6 months of life, minimum age and minimum intervals are only recommended if the person is at risk for imminent exposure to circulating poliovirus (i.e., travel to a polio-endemic region or during an outbreak).
- If 4 or more doses are administered before age 4 years, an additional dose should be administered at age 4 through 6 years and at least 6 months after the previous dose.
- 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.
- If both OPV and IPV were administered as part of a series, a total of 4 doses should be administered, regardless of the child's current age.
- IPV is not routinely recommended for U.S. residents ages 18 years or older.
- For other catch-up guidance, see Figure 2.

8. Influenza vaccines. (Minimum age: 6 months for inactivated influenza vaccine [IIV]; 2 years for live, attenuated influenza vaccine [LAIV])

Routine vaccination:

- Administer influenza vaccine annually to all children beginning at age 6 months. For most healthy, non-pregnant persons ages 2 through 49 years, either LAIV or IIV may be used. However, LAIV should not be administered to some persons, including 1) persons who have experienced severe allergic reactions to LAIV, any of its components, or to a previous dose of any other influenza vaccine; 2) children ages 2 through 17 years receiving aspirin or aspirin-containing products; 3) persons who are allergic to eggs; 4) pregnant women; 5) immunosuppressed persons; 6) children 2 through 4 years with asthma or who had wheezing in the past 12 months, or 7) persons who have taken influenza antiviral medications in the previous 48 hours. For all other contraindications and precautions to use of LAIV, see *MMWR* August 15, 2014/63(32); see pages 691–697, available at www.cdc.gov/mmwr/pdf/rr/mm6332.pdf.

For children ages 6 months through 8 years:

- For the 2014–15 season, administer 2 doses (separated by at least 4 weeks) to children who are receiving influenza vaccine for the first time. Some children in this age group who have been vaccinated previously will also need 2 doses. For additional guidance, follow dosing guidelines in the 2014–2015 ACIP influenza vaccine recommendations, *MMWR* August 15, 2014/63(32); see pages 691–697, available at www.cdc.gov/mmwr/pdf/rr/mm6332.pdf.
- For the 2015–16 season, follow dosing guidelines in the 2015 ACIP influenza vaccine recommendations.

For persons ages 9 years and older:

- Administer 1 dose.

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

Routine vaccination:

- Administer a 2-dose series of MMR vaccine at age 12 through 15 months and 4 through 6 years. The second dose may be administered before age 4 years, provided at least 4 weeks have elapsed since the first dose.
- Administer 1 dose of MMR vaccine to infants ages 6 through 11 months before departure from the United States for international travel. These children should be revaccinated with 2 doses of MMR vaccine, the first at ages 12 through 15 months (12 months if the child remains in an area where disease risk is high) and the second dose at least 4 weeks later.
- Administer 2 doses of MMR vaccine to children ages 12 months and older before departure from the United States for international travel. The first dose should be administered on or after age 12 months and the second dose at least 4 weeks later.

Catch-up vaccination:

- Ensure that all school-aged children and adolescents have had 2 doses of MMR vaccine; the minimum interval between the 2 doses is 4 weeks.

10. Varicella (VAR) vaccine. (Minimum age: 12 months)

Routine vaccination:

- Administer a 2-dose series of VAR vaccine at age 12 through 15 months and 4 through 6 years. The second dose may be administered before age 4 years, provided at least 3 months have elapsed since the first dose. If the second dose was administered at least 4 weeks after the first dose, it can be accepted as valid.

Catch-up vaccination:

- Ensure that all persons ages 7 through 18 years without evidence of immunity (see *MMWR* 2007;56 [No. RR-4], available at www.cdc.gov/mmwr/pdf/rr/rr5604.pdf) have 2 doses of varicella vaccine. For children ages 7 through 12 years, the recommended minimum interval between doses is 3 months (if the second dose was administered at least 4 weeks after the first dose, it can be accepted as valid); for persons ages 13 years and older, the minimum interval between doses is 4 weeks.

11. Hepatitis A (HepA) vaccine. (Minimum age: 12 months)

Routine vaccination:

- Initiate the 2-dose HepA vaccine series at ages 12 through 23 months; separate the 2 doses by 6 to 18 months.
- Children who have received 1 dose of HepA vaccine before age 24 months should receive a second dose 6 to 18 months after the first dose.
- For any person age 2 years or older who has not already received the HepA vaccine series, 2 doses of HepA vaccine separated by 6 to 18 months may be administered if immunity against hepatitis A virus infection is desired.

Catch-up vaccination:

- The minimum interval between the 2 doses is 6 months.

Special populations:

- Administer 2 doses of HepA vaccine at least 6 months apart to previously unvaccinated persons who live in areas where vaccination programs target older children, or who are at increased risk for infection. This includes persons traveling to or working in countries that have high or intermediate endemicity of infection; men having sex with men; users of injection and non-injection illicit drugs; persons who work with HAV-infected primates or with HAV in a research laboratory setting; persons with clotting-factor disorders; persons with chronic liver disease; and persons who anticipate close personal contact (e.g., household or regular babysitting) with an international adoptee during the first 60 days after arrival in the United States from a country with high or intermediate endemicity. The first dose should be administered as soon as the adoption is planned, ideally 2 or more weeks before arrival of the adoptee.

12. Human papillomavirus (HPV) vaccines. (Minimum age: 9 years for HPV2 [Cervarix] and HPV4 [Gardasil])

Routine vaccination:

- Administer a 3-dose series of HPV vaccine on a schedule of 0, 1–2 and 6 months to all adolescents ages 11 through 12 years. Either HPV4 or HPV2 may be used for females, and only HPV4 may be used for males.
- The vaccine series may be started at age 9 years.
- Administer the second dose 1 to 2 months after the first dose (minimum interval of 4 weeks); administer the third dose 24 weeks after the first dose and 16 weeks after the second dose (minimum interval of 12 weeks).

Catch-up vaccination:

- Administer the vaccine series to females (either HPV2 or HPV4) and males (HPV4) at age 13 through 18 years if not previously vaccinated.
- Use recommended routine dosing intervals (see *Routine vaccination* above) for vaccine series catch-up.

13. Meningococcal conjugate vaccines. (Minimum age: 6 weeks for Hib-MenCY [MenHibrix]; 2 months for MenACWY-CRM [Menveo]; 9 months for MenACWY-D [Menactra])

Routine vaccination:

- Administer a single dose of Menactra or Menveo vaccine at age 11 through 12 years, with a booster dose at age 16 years.
- Adolescents ages 11 through 18 years with human immunodeficiency virus (HIV) infection should receive a 2-dose primary series of Menactra or Menveo with at least 8 weeks between doses.
- For children ages 2 months through 18 years with high-risk conditions, see below.

Catch-up vaccination:

- Administer Menactra or Menveo vaccine at age 13 through 18 years if not previously vaccinated.
- If the first dose is administered at age 13 through 15 years, a booster dose should be administered at age 16 through 18 years with a minimum interval of at least 8 weeks between doses.
- If the first dose is administered at age 16 years or older, a booster dose is not needed.
- For other catch-up guidance, see Figure 2.

Vaccination of persons with high-risk conditions and other persons at increased risk of disease:

- Children with anatomic or functional asplenia (including sickle cell disease):
  1. Menveo
     - Children who initiate vaccination at 8 weeks through 6 months: Administer doses at ages 2, 4, 6, and 12 months.
     - Unvaccinated children 7 through 23 months: Administer 2 doses, with the 2nd dose at least 12 weeks after the first dose and after the first birthday.
     - Children 24 months and older who have not received a complete series: Administer 2 primary doses at least 8 weeks apart.
  2. MenHibrix
     - Children 6 weeks through 18 months: Administer doses at ages 2, 4, 6, and 12 through 15 months.
     - If the first dose of MenHibrix is given at or after age 12 months, a total of 2 doses should be given at least 8 weeks apart to ensure protection against serogroups C and Y meningococcal disease.

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Meningococcal conjugate vaccines (footnote cont'd from page 5)

3. Menactra
   - Children 24 months and older who have not received a complete series: Administer 2 primary doses at least 8 weeks apart. If Menactra is administered to a child with asplenia (including sickle cell disease), do not administer Menactra until age 2 years and at least 4 weeks after the completion of all PCV13 doses.

- Children with persistent complement component deficiency:
  1. Menveo
     - Children who initiate vaccination at 8 weeks through 6 months: Administer 2 doses at ages 2, 4, 6, and 12 months.
     - Unvaccinated children 7 through 23 months: Administer 2 doses, with the second dose at least 12 weeks after the first dose and after the first birthday.
     - Children 24 months and older who have not received a complete series: Administer 2 primary doses at least 8 weeks apart.
  2. MenHibrix
     - Children 6 weeks through 18 months: Administer doses at ages 2, 4, 6, and 12 through 15 months.
     - If the first dose of MenHibrix is given at or after age 12 months, a total of 2 doses should be given at least 8 weeks apart to ensure protection against serogroups C and Y meningococcal disease.
  3. Menactra
     - Children 9 through 23 months: Administer 2 primary doses at least 12 weeks apart.
     - Children 24 months and older who have not received a complete series: Administer 2 primary doses at least 8 weeks apart.
- For children who travel to or reside in countries in which meningococcal disease is hyperendemic or epidemic, including countries in the African meningitis belt or the Hajj, administer an age-appropriate formulation and series of Menactra or Menveo for protection against serogroups A and W meningococcal disease. Prior receipt of MenHibrix is not sufficient for children traveling to the meningitis belt or the Hajj because it does not contain serogroups A or W.
- For children at risk during a community outbreak attributable to a vaccine serogroup, administer or complete an age- and formulation-appropriate series of MenHibrix, Menactra, or Menveo.
- For booster doses among persons with high-risk conditions, refer to *MMWR* 2013;62(RR02):1–22, available at www.cdc.gov/mmwr/pdf/rr/rr6202.pdf.

For other catch-up recommendations for these persons, and complete information on use of meningococcal vaccines, including guidance related to vaccination of persons at increased risk of infection, see *MMWR* March 22, 2013;62(RR02): 1–22, available at www.cdc.gov/mmwr/pdf/rr/rr6202.pdf.

Recommended Adult Immunization Schedule – United States, 2015

Note: These recommendations *must* be read with the footnotes that follow containing number of doses, intervals between doses, and other important information.

Figure 1. Recommended adult immunization schedule, by vaccine and age group[1]

Vaccine	19–21 years	22–26 years	27–49 years	50–59 years	60–64 years	≥65 years
Influenza[2,*]	1 dose annually					
Tetanus, diphtheria, pertussis (Td/Tdap)[3,*]	Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs					
Varicella[4,*]	2 doses					
Human papillomavirus (HPV) Female[5,*]	3 doses					
Human papillomavirus (HPV) Male[5,*]	3 doses					
Zoster[6]					1 dose	
Measles, mumps, rubella (MMR)[7,*]	1 or 2 doses					
Pneumococcal 13-valent conjugate (PCV13)[8,*]	1-time dose					
Pneumococcal polysaccharide (PPSV23)[8]	1 or 2 doses					1 dose
Meningococcal[9,*]	1 or more doses					
Hepatitis A[10,*]	2 doses					
Hepatitis B[11,*]	3 doses					
Haemophilus influenzae type b (Hib)[12,*]	1 or 3 doses					

Figure 2. Vaccines that might be indicated for adults based on medical and other indications[1]

Vaccine	Pregnancy	Immunocompromising conditions (excluding human immunodeficiency virus [HIV])[4,6,7,8,13]	HIV Infection CD4+ T lymphocyte count[4,6,7,8,13] <200 cells/μL	HIV Infection CD4+ T lymphocyte count[4,6,7,8,13] ≥200 cells/μL	Men who have sex with men (MSM)	Kidney failure, end-stage renal disease, receipt of hemodialysis	Heart disease, chronic lung disease, chronic alcoholism	Asplenia (including elective splenectomy and persistent complement component deficiencies)[8,12]	Chronic liver disease	Diabetes	Healthcare personnel
Influenza[2,*]	1 dose IIV annually				I dose IIV or LAIV annually	I dose IIV annually					I dose IIV or LAIV annually
Td/Tdap[3,*]	1 dose Tdap in each pregnancy	Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs									
Varicella[4,*]	Contraindicated			2 doses							
HPV Female[5,*]		3 doses through age 26 yrs				3 doses through age 26 yrs					
HPV Male[5,*]		3 doses through age 26 yrs				3 doses through age 21 yrs					
Zoster[6]	Contraindicated				1 dose						
MMR[7,*]	Contraindicated			1 or 2 doses							
PCV13[8,*]					1 dose						
PPSV23[8]					1 or 2 doses						
Meningococcal[9,*]	1 or more doses										
Hepatitis A[10,*]					2 doses						
Hepatitis B[11,*]			3 doses								
Hib[12,*]		Post-HSCT recipients only	1 or 3 doses								

***Covered by the Vaccine Injury Compensation Program.**

- For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection; zoster vaccine recommended regardless of prior episode of zoster
- Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indication)
- No recommendation

These schedules indicate the recommended age groups and medical indications for which administration of currently licensed vaccines is commonly indicated for adults ages 19 years and older, as of February 1, 2015. For all vaccines being recommended on the Adult Immunization Schedule: a vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Licensed combination vaccines may be used whenever any components of the combination are indicated and when the vaccine's other components are not contraindicated. For detailed recommendations on all vaccines, including those used primarily for travelers or that are issued during the year, consult the manufacturers' package inserts and the complete statements from the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/hcp/acip-recs/index.html). Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

Footnotes

1. Additional Information

- Additional guidance for the use of the vaccines described in this supplement is available at www. cdc.gov/vaccines/hcp/acip-recs/index.html.
- Information on vaccination recommendations when vaccination status is unknown and other general immunization information can be found in the General Recommendations on Immunization at www.cdc.gov/mmwr/preview/mmwrhtml/rr6002a1.htm.
- Information on travel vaccine requirements and recommendations (e.g., for hepatitis A and B, meningococcal, and other vaccines) is available at wwwnc.cdc.gov/travel/destinations/list.
- Additional information and resources regarding vaccination of pregnant women can be found at www.cdc.gov/vaccines/adults/rec-vac/pregnant.html.

2. Influenza vaccination.

- Annual vaccination against influenza is recommended for all persons age 6 months or older.
- Persons age 6 months and older, including pregnant women and persons with hives-only allergy to eggs, can receive the inactivated influenza vaccine (IIV). An age-appropriate IIV formulation should be used.
- Adults age 18 years or older can receive the recombinant influenza vaccine (RIV) (Flublok). RIV does not contain any egg protein and can be given to age-appropriate persons with egg allergy or any severity.
- Healthy, nonpregnant persons age 2 through 49 years without high-risk medical conditions can receive either intranasally administered live, attenuated influenza vaccine (LAIV) (FluMist), or IIV.
- Healthcare personnel who care for severely immunocompromised persons who require care in a protected environment should receive IIV or RIV; healthcare personnel who receive LAIV should avoid providing care for severely immunosuppressed persons for 7 days after vaccination.
- The intramuscularly or intradermally administered IIV are options for adults age 18 through 64 years.
- Adults age 65 years or older can receive the standard-dose IIV or the high-dose IIV (Fluzone High-Dose).
- A list of currently available influenza vaccines can be found at www.cdc.gov/flu/protect/vaccine/vaccines.htm.

3. Tetanus, diphtheria, and acellular pertussis (Td/Tdap) vaccination.

- Administer 1 dose of Tdap vaccine to pregnant women during each pregnancy (preferably during 27 to 36 weeks' gestation), regardless of interval since prior Td or Tdap vaccination.
- Persons age 11 years or older who have not received Tdap vaccine or for whom vaccine status is unknown should receive a dose of Tdap followed by tetanus and diphtheria toxoids (Td) booster doses every 10 years thereafter. Tdap can be administered regardless of interval since the most recent tetanus or diphtheria-toxoid containing vaccine.
- Adults with an unknown or incomplete history of completing a 3-dose primary vaccination series with Td-containing vaccines should begin or complete a primary vaccination series including a Tdap dose.
- For unvaccinated adults, administer the first 2 doses at least 4 weeks apart and the third dose 6 to 12 months after the second.
- For incompletely vaccinated (i.e., less than 3 doses) adults, administer remaining doses.
- Refer to the ACIP statement for recommendations for administering Td/Tdap as prophylaxis in wound management (see footnote 1).

4. Varicella vaccination.

- All adults without evidence of immunity to varicella (as defined below) should receive 2 doses of single-antigen varicella vaccine or a second dose if they have received only 1 dose.
- Vaccination should be emphasized for those who have close contact with persons at high risk for severe disease (e.g., healthcare personnel and family contacts of persons with immunocompromising conditions) or are at high risk for exposure or transmission (e.g., teachers; child care employees; residents and staff members of institutional settings, including correctional institutions; college students; military personnel; adolescents and adults living in households with children; nonpregnant women of childbearing age; and international travelers).
- Pregnant women should be assessed for evidence of varicella immunity. Women who do not have evidence of immunity should receive the first dose of varicella vaccine upon completion or termination of pregnancy and before discharge from the healthcare facility. The second dose should be administered 4 to 8 weeks after the first dose.
- Evidence of immunity to varicella in adults includes any of the following: 1) documentation of 2 doses of varicella vaccine at least 4 weeks apart; 2) U.S.-born before 1980, except healthcare personnel and pregnant women; 3) history of varicella based on diagnosis or verification of varicella disease by a healthcare provider; 4) history of herpes zoster based on diagnosis or verification of herpes zoster disease by a healthcare provider; or 5) laboratory evidence of immunity or laboratory confirmation of disease.

5. Human papillomavirus (HPV) vaccination.

- Two vaccines are licensed for use in females, bivalent HPV vaccine (HPV2) and quadrivalent HPV vaccine (HPV4), and one HPV vaccine for use in males (HPV4).
- For females, either HPV4 or HPV2 is recommended in a 3-dose series for routine vaccination at age 11 or 12 years, and for those age 13 through 26 years, if not previously vaccinated.
- For males, HPV4 is recommended in a 3-dose series for routine vaccination at age 11 or 12 years and for those age 13 through 21 years, if not previously vaccinated. Males age 22 through 26 years may be vaccinated.
- HPV4 is recommended for men who have sex with men through age 26 years for those who did not get any or all doses when they were younger.
- Vaccination is recommended for immunocompromised persons (including those with HIV infection) through age 26 years for those who did not get any or all doses when they were younger.
- A complete series for either HPV4 or HPV2 consists of 3 doses. The second dose should be administered 4 to 8 weeks (minimum interval of 4 weeks) after the first dose; the third dose should be administered 24 weeks after the first dose and 16 weeks after the second dose (minimum interval of at least 12 weeks).
- HPV vaccines are not recommended for use in pregnant women. However, pregnancy testing is not needed before vaccination. If a woman is found to be pregnant after initiating the vaccination series, no intervention is needed; the remainder of the 3-dose series should be delayed until completion or termination of pregnancy.

6. Zoster vaccination.

- A single dose of zoster vaccine is recommended for adults age 60 years or older regardless of whether they report a prior episode of herpes zoster. Although the vaccine is licensed by the U.S. Food and Drug Administration for use among and can be administered to persons age 50 years or older, ACIP recommends that vaccination begin at age 60 years.
- Persons age 60 years and older with chronic medical conditions may be vaccinated unless their condition constitutes a contraindication, such as pregnancy or severe immunodeficiency.

7. Measles, mumps, rubella (MMR) vaccination.

- Adults born before 1957 are generally considered immune to measles and mumps. All adults born in 1957 or later should have documentation of 1 or more doses of MMR vaccine unless they have a medical contraindication to the vaccine or laboratory evidence of immunity to each of the three diseases. Documentation of provider-diagnosed disease is not considered acceptable evidence of immunity for measles, mumps, or rubella.
- *Measles component:* A routine second dose of MMR vaccine, administered a minimum of 28 days after the first dose, is recommended for adults who: 1) are students in postsecondary educational institutions, 2) work in a healthcare facility, or 3) plan to travel internationally. Persons who received inactivated (killed) measles vaccine or measles vaccine of unknown type from 1963–1967 should be revaccinated with 2 doses of MMR vaccine.
- *Mumps component:* A routine second dose of MMR vaccine, administered a minimum of 28 days after the first dose, is recommended for adults who: 1) are students in a postsecondary educational institution, 2) work in a healthcare facility, or 3) plan to travel internationally. Persons vaccinated before 1979 with either killed mumps vaccine or mumps vaccine of unknown type who are at high risk for mumps infection (e.g., persons who are working in a healthcare facility) should be considered for revaccination with 2 doses of MMR vaccine.
- *Rubella component:* For women of childbearing age, regardless of birth year, rubella immunity should be determined. If there is no evidence of immunity, women who are not pregnant should be vaccinated. Pregnant women who do not have evidence of immunity should receive MMR vaccine upon completion or termination of pregnancy and before discharge from the healthcare facility.
- *Healthcare personnel born before 1957:* For unvaccinated healthcare personnel born before 1957 who lack laboratory evidence of measles, mumps, and/or rubella immunity or laboratory confirmation of disease, healthcare facilities should consider vaccinating personnel with 2 doses of MMR vaccine at the appropriate interval for measles and mumps or 1 dose of MMR vaccine for rubella.

8. Pneumococcal (13-valent pneumococcal conjugate vaccine [PCV13] and 23-valent pneumococcal polysaccharide vaccine [PPSV23]) vaccination.

- General information
  - When indicated, only a single dose of PCV13 is recommended for adults.
  - No additional PPSV23 is indicated for adults vaccinated with PPSV23 at or after age 65 years.
  - When both PCV13 and PPSV23 are indicated, PCV13 should be administered first; PCV13 and PPSV23 should not be administered during the same visit.
  - When indicated, PCV13 and PPSV23 should be administered to adults whose pneumococcal vaccination history is incomplete or unknown.
- Adults age 65 years and older who
  - have not received PCV13 or PPSV23: administer PCV13 followed by a PPSV23 in 6 to 12 months.
  - have not received PCV13 but have received a dose of PPSV23 at age 65 years or older: administer PCV13 at least 1 year after the dose of PPSV23 received at age 65 years or older.
  - have not received PCV13 but have received 1 or more doses of PPSV23 before age 65: administer PCV13 at least 1 year after the most recent PPSV23; administer a dose of PPSV23 6 to 12 months after PCV13, or as soon as possible if this time window has passed, and at least 5 years after most recent dose of PPSV23.
  - have received PCV13 but not PPSV23 before age 65 years: administer PPSV23 6 to 12 months after PCV13 or as soon as possible if this time window has passed.

(continued)

- have received PCV13 and 1 or more doses of PPSV23 before age 65 years: administer PPSV23 6 to 12 months after PCV13, or as soon as possible if this time window has passed, and at least 5 years after the most recent dose of PPSV23.

- Adults age 19 through 64 years with immunocompromising conditions or functional or anatomic asplenia (defined below) who
  - have not received PCV13 or PPSV23: administer PCV13 followed by PPSV23 at least 8 weeks after PCV13; administer a second dose of PPSV23 at least 5 years after the first dose of PPSV23.
  - have not received PCV13 but have received 1 dose of PPSV23: administer PCV13 at least 1 year after the PPSV23; administer a second dose of PPSV23 at least 8 weeks after PCV13 and at least 5 years after the first dose of PPSV23.
  - have not received PCV13 but have received 2 or more doses of PPSV23: administer PCV13 and at least 1 year after the most recent dose of PPSV23.
  - have received PCV13 but not PPSV23: administer PPSV23 at least 8 weeks after PCV13; administer a second dose of PPSV23 at least 5 years after the first dose of PPSV23.
  - have received PCV13 and 1 dose of PPSV23: administer a second dose of PPSV23 at least 5 years after the first dose of PPSV23.
- Adults age 19 through 64 years who have cerebrospinal fluid leaks or cochlear implants: administer PCV13 followed by PPSV23 at least 8 weeks after PCV13.
- Adults age 19 through 64 years who have chronic heart disease (including congestive heart failure and cardiomyopathies, excluding hypertension), chronic lung disease (including chronic obstructive lung disease, emphysema, and asthma), chronic liver disease (including cirrhosis), alcoholism, or diabetes mellitus: administer PPSV23.
- Adults age 19 through 64 years who smoke cigarettes or reside in nursing homes or long-term care facilities: administer PPSV23.
- Routine pneumococcal vaccination is not recommended for American Indian/Alaska Native or other adults unless they have the indications as above; however, public health authorities may consider recommending the use of pneumococcal vaccines for American Indians/Alaska Natives or other adults who live in areas with increased risk for invasive pneumococcal disease.
- **Immunocompromising conditions** that are indications for pneumococcal vaccination are: congenital or acquired immunodeficiency (including B- or T-lymphocyte deficiency, complement deficiencies, and phagocytic disorders excluding chronic granulomatous disease), HIV infection, chronic renal failure, nephrotic syndrome, leukemia, lymphoma, Hodgkin's disease, generalized malignancy, multiple myeloma, solid organ transplant, and iatrogenic immunosuppression (including long-term systemic corticosteroids and radiation therapy
- **Anatomical or functional asplenia** that are indications for pneumococcal vaccination are: sickle cell disease and other hemoglobinopathies, congenital or acquired asplenia, splenic dysfunction, and splenectomy. Administer pneumococcal vaccines at least 2 weeks before immunosuppressive therapy or an elective splenectomy, and as soon as possible to adults who are newly diagnosed with asymptomatic or symptomatic HIV infection.

9. Meningococcal vaccination.

- Administer 2 doses of quadrivalent meningococcal conjugate vaccine (MenACWY [Menactra, Menveo]) at least 2 months apart to adults of all ages with anatomical or functional asplenia or persistent complement component deficiencies. HIV infection is not an indication for routine vaccination with MenACWY. If an HIV-infected person of any age is vaccinated, 2 doses of MenACWY vaccine should be administered at least 2 months apart.
- Administer a single dose of meningococcal vaccine to microbiologists routinely exposed to isolates of *Neisseria meningitidis,* military recruits, persons at risk during an outbreak attributable to a vaccine serogroup, and persons who travel to or live in countries in which meningococcal disease is hyperendemic or epidemic.
- First-year college students up through age 21 years who are living in residence halls should be vaccinated if they have not received a dose on or after their 16th birthday.
- MenACWY is preferred for adults with any of the preceding indications who are age 55 years or younger as well as for adults age 56 years or older who a) were vaccinated previously with MenACWY and are recommended for revaccination, or b) for whom multiple doses are anticipated. Meningococcal polysaccharide vaccine (MPSV4 [Menomune]) is preferred for adults age 56 years or older who have not received MenACWY previously and who require a single dose only (e.g., travelers).
- Revaccination with MenACWY every 5 years is recommended for adults previously vaccinated with MenACWY or MPSV4 who remain at increased risk for infection (e.g., adults with anatomical or functional asplenia, persistent complement component deficiencies, or microbiologists).

10. Hepatitis A vaccination.

- Vaccinate any person seeking protection from hepatitis A virus (HAV) infection and persons with any of the following indications:
  - men who have sex with men and persons who use injection or noninjection illicit drugs;
  - persons working with HAV-infected primates or with HAV in a research laboratory setting;
  - persons with chronic liver disease and persons who receive clotting factor concentrates;
  - persons traveling to or working in countries that have high or intermediate endemicity of hepatitis A; and
  - unvaccinated persons who anticipate close personal contact (e.g., household or regular babysitting) with an international adoptee during the first 60 days after arrival in the United States from a country with high or intermediate endemicity. (See footnote 1 for more information on travel recommendations.) The first dose of the 2-dose hepatitis A vaccine series should be administered as soon as adoption is planned, ideally 2 or more weeks before the arrival of the adoptee.
- Single-antigen vaccine formulations should be administered in a 2-dose schedule at either 0 and 6 to 12 months (Havrix), or 0 and 6 to 18 months (Vaqta). If the combined hepatitis A and hepatitis B vaccine (Twinrix) is used, administer 3 doses at 0, 1, and 6 months; alternatively, a 4-dose schedule may be used, administered on days 0, 7, and 21 to 30, followed by a booster dose at month 12.

11. Hepatitis B vaccination.

- Vaccinate persons with any of the following indications and any person seeking protection from hepatitis B virus (HBV) infection:
  - sexually active persons who are not in a long-term, mutually monogamous relationship (e.g., persons with more than 1 sex partner during the previous 6 months); persons seeking evaluation or treatment for a sexually transmitted disease (STD); current or recent injection drug users; and men who have sex with men;
  - healthcare personnel and public safety workers who are potentially exposed to blood or other infectious body fluids;
  - persons with diabetes who are younger than age 60 years as soon as feasible after diagnosis; persons with diabetes who are age 60 years or older at the discretion of the treating clinician based on the likelihood of acquiring HBV infection, including the risk posed by an increased need for assisted blood glucose monitoring in long-term care facilities, the likelihood of experiencing chronic sequelae if infected with HBV, and the likelihood of immune response to vaccination;
  - persons with end-stage renal disease, including patients receiving hemodialysis, persons with HIV infection, and persons with chronic liver disease;
  - household contacts and sex partners of hepatitis B surface antigen-positive persons, clients and staff members of institutions for persons with developmental disabilities, and international travelers to countries with high or intermediate prevalence of chronic HBV infection; and
  - all adults in the following settings: STD treatment facilities, HIV testing and treatment facilities, facilities providing drug abuse treatment and prevention services, healthcare settings targeting services to injection drug users or men who have sex with men, correctional facilities, end-stage renal disease programs and facilities for chronic hemodialysis patients, and institutions and nonresidential day care facilities for persons with developmental disabilities.
- Administer missing doses to complete a 3-dose series of hepatitis B vaccine to those persons not vaccinated or not completely vaccinated. The second dose should be administered 1 month after the first dose; the third dose should be given at least 2 months after the second dose (and at least 4 months after the first dose). If the combined hepatitis A and hepatitis B vaccine (Twinrix) is used, give 3 doses at 0, 1, and 6 months; alternatively, a 4-dose Twinrix schedule, administered on days 0, 7, and 21 to 30 followed by a booster dose at month 12 may be used.
- Adult patients receiving hemodialysis or with other immunocompromising conditions should receive 1 dose of 40 mcg/mL (Recombivax HB) administered on a 3-dose schedule at 0, 1, and 6 months or 2 doses of 20 mcg/mL (Engerix-B) administered simultaneously on a 4-dose schedule at 0, 1, 2, and 6 months.

12. *Haemophilus influenzae* type b (Hib) vaccination.

- One dose of Hib vaccine should be administered to persons who have anatomical or functional asplenia or sickle cell disease or are undergoing elective splenectomy if they have not previously received Hib vaccine. Hib vaccination 14 or more days before splenectomy is suggested.
- Recipients of hematopoietic stem cell transplant (HSCT) should be vaccinated with a 3-dose regimen 6 to 12 months after a successful transplant, regardless of vaccination history; at least 4 weeks should separate doses.
- Hib vaccine is not recommended for adults with HIV infection since their risk for Hib infection is low.

13. Immunocompromising conditions.

Inactivated vaccines generally are acceptable (e.g., pneumococcal, meningococcal, and inactivated influenza vaccine) and live vaccines generally are avoided in persons with immune deficiencies or immunocompromising conditions. Information on specific conditions is available at www.cdc.gov/vaccines/hcp/acip-recs/index.html.

Report all clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting System (VAERS). Reporting forms and instructions on filing a VAERS report are available at www.vaers.hhs.gov or by telephone, 800-822-7967. Information on how to file a Vaccine Injury Compensation Program claim is available at www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382. To file a claim for vaccine injury, contact the U.S. Court of Federal Claims, 717 Madison Place, N.W., Washington, D.C. 20005; telephone, 202-357-6400. Additional information about the vaccines in this schedule, extent of available data, and contraindications for vaccination is also available at www.cdc.gov/vaccines or from the CDC-INFO Contact Center at 800-CDC-INFO (800-232-4636) in English and Spanish, 8:00 a.m. – 8:00 p.m. Eastern Time, Monday – Friday, excluding holidays.

Guide to Contraindications and Precautions to Commonly Used Vaccines[1,*,†] (page 1 of 2)

Vaccine	Contraindications	Precautions
Hepatitis B (HepB)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component	• Moderate or severe acute illness with or without fever • Infant weighing less than 2000 grams (4 lbs, 6.4 oz)[2]
Rotavirus (RV5 [RotaTeq], RV1 [Rotarix])	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component • Severe combined immunodeficiency (SCID) • History of intussusception	• Moderate or severe acute illness with or without fever • Altered immunocompetence other than SCID • Chronic gastrointestinal disease[3] • Spina bifida or bladder exstrophy[3]
Diphtheria, tetanus, pertussis (DTaP) **Tetanus, diphtheria, pertussis (Tdap)** **Tetanus, diphtheria (DT, Td)**	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component • For pertussis-containing vaccines: encephalopathy (e.g., coma, decreased level of consciousness, prolonged seizures) not attributable to another identifiable cause within 7 days of administration of a previous dose of DTP or DTaP (for DTaP); or of previous dose of DTP, DTaP, or Tdap (for Tdap)	• Moderate or severe acute illness with or without fever • Guillain-Barré syndrome (GBS) within 6 weeks after a previous dose of tetanus toxoid-containing vaccine • History of Arthus-type hypersensitivity reactions after a previous dose of tetanus or diphtheria toxoid-containing vaccine; defer vaccination until at least 10 years have elapsed since the last tetanus-toxoid containing vaccine • For pertussis-containing vaccines: progressive or unstable neurologic disorder (including infantile spasms for DTaP), uncontrolled seizures, or progressive encephalopathy until a treatment regimen has been established and the condition has stabilized **For DTaP only:** • Temperature of 105° F or higher (40.5° C or higher) within 48 hours after vaccination with a previous dose of DTP/DTaP • Collapse or shock-like state (i.e., hypotonic hyporesponsive episode) within 48 hours after receiving a previous dose of DTP/DTaP • Seizure within 3 days after receiving a previous dose of DTP/DTaP • Persistent, inconsolable crying lasting 3 or more hours within 48 hours after receiving a previous dose of DTP/DTaP
***Haemophilus influenzae* type b (Hib)**	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component • Age younger than 6 weeks	• Moderate or severe acute illness with or without fever
Inactivated poliovirus vaccine (IPV)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component	• Moderate or severe acute illness with or without fever • Pregnancy
Pneumococcal (PCV13 or PPSV23)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component (including, for PCV13, to any diphtheria toxoid-containing vaccine)	• Moderate or severe acute illness with or without fever
Measles, mumps, rubella (MMR)[4]	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component • Known severe immunodeficiency (e.g., from hematologic and solid tumors, receipt of chemotherapy, congenital immunodeficiency, or long-term immunosuppressive therapy[5] or patients with human immunodeficiency virus [HIV] infection who are severely immunocompromised)[6] • Pregnancy	• Moderate or severe acute illness with or without fever • Recent (within 11 months) receipt of antibody-containing blood product (specific interval depends on product)[7] • History of thrombocytopenia or thrombocytopenic purpura • Need for tuberculin skin testing[8]
Varicella (Var)[4]	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component • Known severe immunodeficiency (e.g., from hematologic and solid tumors, receipt of chemotherapy, congenital immunodeficiency, or long-term immunosuppressive therapy[5] or patients with HIV infection who are severely immunocompromised)[6] • Pregnancy	• Moderate or severe acute illness with or without fever • Recent (within 11 months) receipt of antibody-containing blood product (specific interval depends on product)[7] • Receipt of specific antivirals (i.e., acyclovir, famciclovir, or valacyclovir) 24 hours before vaccination; avoid use of these antiviral drugs for 14 days after vaccination.
Hepatitis A (HepA)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component	• Moderate or severe acute illness with or without fever

(continued on page 2)

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Immunization Action Coalition Saint Paul, Minnesota • 651-647-9009 • www.immunize.org • www.vaccineinformation.org

www.immunize.org/catg.d/p3072a.pdf • Item #P3072a (5/15)

Guide to Contraindications and Precautions to Commonly Used Vaccines[1,*,†] (page 2 of 2)

Vaccine	Contraindications	Precautions
Influenza, inactivated injectable (IIV)[9]	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose of any influenza vaccine or to a vaccine component, including egg protein	• Moderate or severe acute illness with or without fever • History of GBS within 6 weeks of previous influenza vaccination • Persons who experience only hives with exposure to eggs may receive RIV or, with additional safety precautions, IIV.[9]
Influenza, recombinant (RIV)[9]	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose of RIV or to a vaccine component. RIV does not contain any egg protein.[9]	• Moderate or severe acute illness with or without fever • History of GBS within 6 weeks of previous influenza vaccination
Influenza, live attenuated (LAIV)[4,9]	• People younger than age 2 years or older than age 49 years. • Severe allergic reaction (e.g., anaphylaxis) to any component of the vaccine, or to a previous dose of any influenza vaccine • Concomitant use of aspirin or aspirin-containing medication in children or adolescents through age 17 years • In addition, ACIP recommends that LAIV not be used in the following populations: pregnant women; immunosuppressed people; people with egg allergy of any severity; children ages 2 through 4 years who have asthma or had wheezing within the past 12 months, per healthcare provider statement; people who have taken influenza antiviral medications (amantadine, rimantadine, zanamivir, or oseltamivir) within the previous 48 hours; avoid use of these antiviral durgs for 14 days after vaccination	• Moderate or severe acute illness with or without fever • History of GBS within 6 weeks of previous influenza vaccination • Asthma in persons age 5 years and older • Other chronic medical conditions (e.g., other chronic lung diseases, chronic cardiovascular disease [excluding isolated hypertension], diabetes, chronic renal or hepatic disease, hematologic disease, neurologic disease, and metabolic disorders)
Human papillomavirus (HPV)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component	• Moderate or severe acute illness with or without fever • Pregnancy
Meningococcal: conjugate (MenACWY), polysaccharide (MPSV4)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component	• Moderate or severe acute illness with or without fever
Zoster (HZV)[4]	• Severe allergic reaction (e.g., anaphylaxis) to a vaccine component • Known severe cellular immunodeficiency (e.g., from hematologic and solid tumors, receipt of chemotherapy, or long-term immunosuppressive therapy[5] or patients with HIV infection who are severely immunocompromised). • Pregnancy	• Moderate or severe acute illness with or without fever • Receipt of specific antivirals (i.e., acyclovir, famciclovir, or valacyclovir) 24 hours before vaccination; avoid use of these antiviral drugs for 14 days after vaccination.

FOOTNOTES

1. Vaccine package inserts and the full ACIP recommendations for these vaccines should be consulted for additional information on vaccine-related contraindications and precautions and for more information on vaccine excipients. Events or conditions listed as precautions should be reviewed carefully. Benefits of and risks for administering a specific vaccine to a person under these circumstances should be considered. If the risk from the vaccine is believed to outweigh the benefit, the vaccine should not be administered. If the benefit of vaccination is believed to outweigh the risk, the vaccine should be administered. A contraindication increases the chance of a serious adverse reaction. Therefore, a vaccine should not be administered when a contraindication is present. Whether and when to administer DTaP to children with proven or suspected underlying neuro-logic disorders should be decided on a case-by-case basis.
2. Hepatitis B vaccination should be deferred for preterm infants and infants weighing less than 2000 g if the mother is documented to be hepatitis B surface antigen (HBsAg)-negative at the time of the infant's birth. Vaccination can commence at chronological age 1 month or at hospital discharge. For infants born to women who are HBsAg-positive, hepatitis B immunoglobulin and hepatitis B vaccine should be administered within 12 hours of birth, regardless of weight.
3. For details, see CDC. "Prevention of Rotavirus Gastroenteritis among Infants and Children: Recommendations of the Advisory Committee on Immunization Practices. (ACIP)" *MMWR* 2009;58(No. RR–2), available at www.cdc.gov/vaccines/hcp/acip-recs/index.html.
4. LAIV, MMR, varicella, or zoster vaccines can be administered on the same day. If not administered on the same day, these live vaccines should be separated by at least 28 days.
5. Immunosuppressive steroid dose is considered to be 2 or more weeks of daily receipt of 20 mg prednisone or equivalent. Vaccination should be deferred for at least 1 month after discontinuation of such therapy. Providers should consult ACIP recommendations for complete information on the use of specific live vaccines among persons on immune-suppressing medications or with immune suppression because of other reasons.
6. HIV-infected children may receive varicella and measles vaccine if CD4+ T-lymphocyte count is >15%. (Source: Adapted from American Academy of Pediatrics. Immunization in Special Clinical Circumstances. In: Pickering LK, ed. *Red Book: 2012 Report of the Committee on Infectious Diseases*. 29th ed. Elk Grove Village, IL: American Academy of Pediatrics: 2012.)
7. Vaccine should be deferred for the appropriate interval if replacement immune globulin products are being administered (see "Table 5. Recommended Intervals Between Administration of Antibody-Containing Products and Measles- or Varicella-Containing Vaccine, by Product and Indication for Vaccination" found in "General Recommendations on Immunization: Recommendations of the Advisory Committee on Immunization Practices (ACIP)" *MMWR* 2011;60(No. RR-2) available at www.cdc.gov/vaccines/hcp/acip-recs/index.html.)
8. Measles vaccination might suppress tuberculin reactivity temporarily. Measles-containing vaccine may be administered on the same day as tuberculin skin testing. If testing cannot be performed until after the day of MMR vaccination, the test should be postponed for at least 4 weeks after the vaccination. If an urgent need exists to skin test, do so with the understanding that reactivity might be reduced by the vaccine.
9. For more information on use of influenza vaccines among persons with egg allergies and a complete list of conditions that CDC considers to be reasons to avoid getting LAIV, see CDC. "Prevention and Control of Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices (ACIP) – United States, 2014–15" *MMWR* 2014;63(32):691–97.

* Adapted from "Table 6. Contraindications and Precautions to Commonly Used Vaccines" found in: CDC. "General Recommendations on Immunization: Recommendations of the Advisory Committee on Immunization Practices (ACIP)." *MMWR* 2011; 60(No. RR-2), p. 40–41, and from Atkinson W, Wolfe S, Hamborsky J, eds. Appendix A. *Epidemiology and Prevention of Vaccine-Preventable Diseases*.12th ed.

† Regarding latex allergy, consult the package insert for any vaccine administered.

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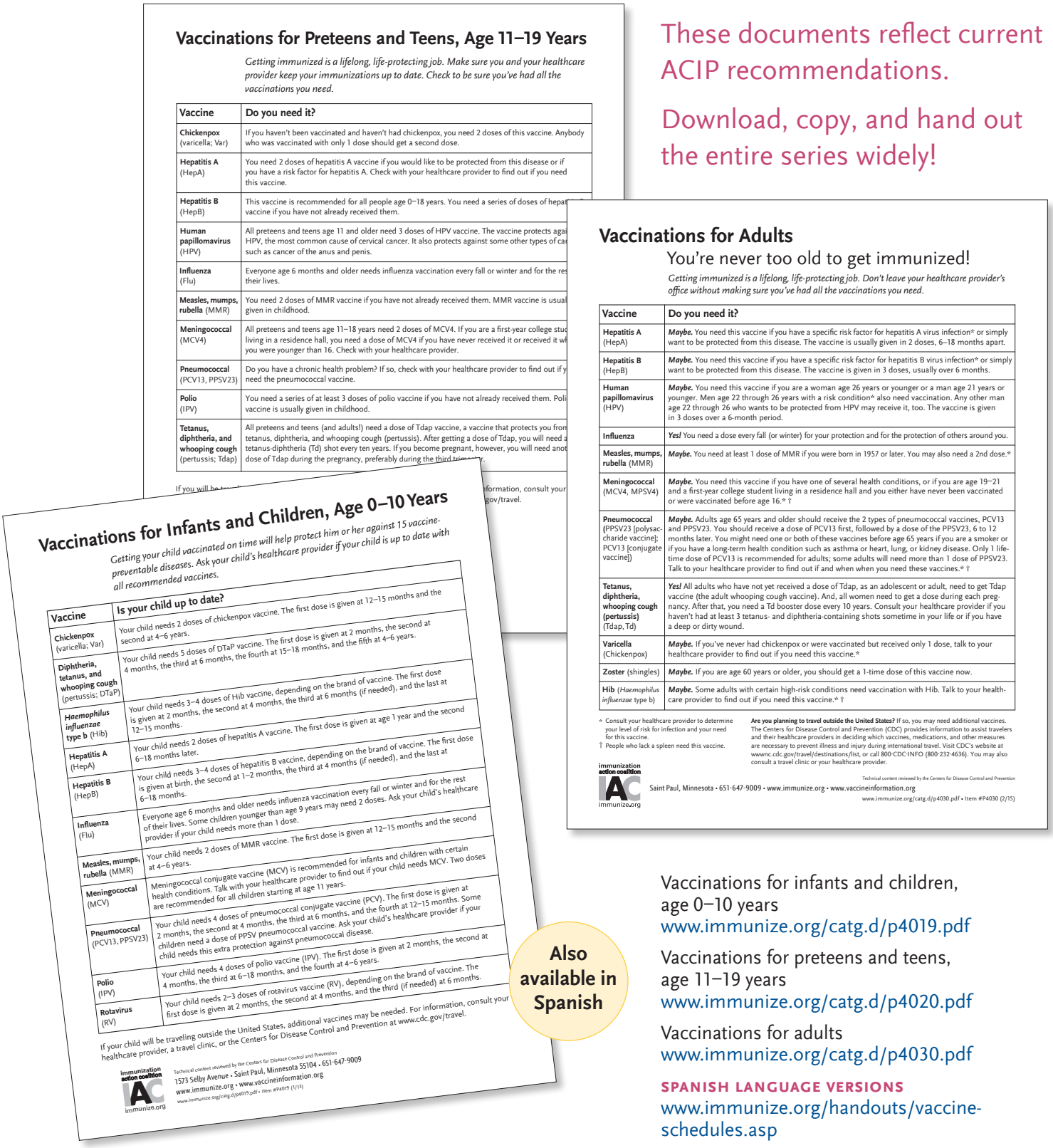
Vaccination Schedules for All Age Groups: Infants, Children, Preteens, Teens, and Adults



Vaccinations for Preteens and Teens, Age 11–19 Years

Getting immunized is a lifelong, life-protecting job. Make sure you and your healthcare provider keep your immunizations up to date. Check to be sure you've had all the vaccinations you need.

Vaccine	Do you need it?
Chickenpox (varicella; Var)	If you haven't been vaccinated and haven't had chickenpox, you need 2 doses of this vaccine. Anybody who was vaccinated with only 1 dose should get a second dose.
Hepatitis A (HepA)	You need 2 doses of hepatitis A vaccine if you would like to be protected from this disease or if you have a risk factor for hepatitis A. Check with your healthcare provider to find out if you need this vaccine.
Hepatitis B (HepB)	This vaccine is recommended for all people age 0–18 years. You need a series of doses of hepat vaccine if you have not already received them.
Human papillomavirus (HPV)	All preteens and teens age 11 and older need 3 doses of HPV vaccine. The vaccine protects agai HPV, the most common cause of cervical cancer. It also protects against some other types of ca such as cancer of the anus and penis.
Influenza (Flu)	Everyone age 6 months and older needs influenza vaccination every fall or winter and for the re their lives.
Measles, mumps, rubella (MMR)	You need 2 doses of MMR vaccine if you have not already received them. MMR vaccine is usual given in childhood.
Meningococcal (MCV4)	All preteens and teens age 11–18 years need 2 doses of MCV4. If you are a first-year college stud living in a residence hall, you need a dose of MCV4 if you have never received it or received it w you were younger than 16. Check with your healthcare provider.
Pneumococcal (PCV13, PPSV23)	Do you have a chronic health problem? If so, check with your healthcare provider to find out if y need the pneumococcal vaccine.
Polio (IPV)	You need a series of at least 3 doses of polio vaccine if you have not already received them. Poli vaccine is usually given in childhood.
Tetanus, diphtheria, and whooping cough (pertussis; Tdap)	All preteens and teens (and adults!) need a dose of Tdap vaccine, a vaccine that protects you fro tetanus, diphtheria, and whooping cough (pertussis). After getting a dose of Tdap, you will need a tetanus-diphtheria (Td) shot every ten years. If you become pregnant, however, you will need anot dose of Tdap during the pregnancy, preferably during the third trim

If you will be t formation, consult your gov/travel.

Vaccinations for Infants and Children, Age 0–10 Years

Getting your child vaccinated on time will help protect him or her against 15 vaccine-preventable diseases. Ask your child's healthcare provider if your child is up to date with all recommended vaccines.

Vaccine	Is your child up to date?
Chickenpox (varicella; Var)	Your child needs 2 doses of chickenpox vaccine. The first dose is given at 12–15 months and the second at 4–6 years.
Diphtheria, tetanus, and whooping cough (pertussis; DTaP)	Your child needs 5 doses of DTaP vaccine. The first dose is given at 2 months, the second at 4 months, the third at 6 months, the fourth at 15–18 months, and the fifth at 4–6 years.
***Haemophilus influenzae* type b** (Hib)	Your child needs 3–4 doses of Hib vaccine, depending on the brand of vaccine. The first dose is given at 2 months, the second at 4 months, the third at 6 months (if needed), and the last at 12–15 months.
Hepatitis A (HepA)	Your child needs 2 doses of hepatitis A vaccine. The first dose is given at age 1 year and the second 6–18 months later.
Hepatitis B (HepB)	Your child needs 3–4 doses of hepatitis B vaccine, depending on the brand of vaccine. The first dose is given at birth, the second at 1–2 months, the third at 4 months (if needed), and the last at 6–18 months.
Influenza (Flu)	Everyone age 6 months and older needs influenza vaccination every fall or winter and for the rest of their lives. Some children younger than age 9 years may need 2 doses. Ask your child's healthcare provider if your child needs more than 1 dose.
Measles, mumps, rubella (MMR)	Your child needs 2 doses of MMR vaccine. The first dose is given at 12–15 months and the second at 4–6 years.
Meningococcal (MCV)	Meningococcal conjugate vaccine (MCV) is recommended for infants and children with certain health conditions. Talk with your healthcare provider to find out if your child needs MCV. Two doses are recommended for all children starting at age 11 years.
Pneumococcal (PCV13, PPSV23)	Your child needs 4 doses of pneumococcal conjugate vaccine (PCV). The first dose is given at 2 months, the second at 4 months, the third at 6 months, and the fourth at 12–15 months. Some children need a dose of PPSV pneumococcal vaccine. Ask your child's healthcare provider if your child needs this extra protection against pneumococcal disease.
Polio (IPV)	Your child needs 4 doses of polio vaccine (IPV). The first dose is given at 2 months, the second at 4 months, the third at 6–18 months, and the fourth at 4–6 years.
Rotavirus (RV)	Your child needs 2–3 doses of rotavirus vaccine (RV), depending on the brand of vaccine. The first dose is given at 2 months, the second at 4 months, and the third (if needed) at 6 months.

If your child will be traveling outside the United States, additional vaccines may be needed. For information, consult your healthcare provider, a travel clinic, or the Centers for Disease Control and Prevention at www.cdc.gov/travel.

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www.immunize.org/catg.d/p4019.pdf • Item #P4019 (1/13)

Vaccinations for Adults

You're never too old to get immunized!

Getting immunized is a lifelong, life-protecting job. Don't leave your healthcare provider's office without making sure you've had all the vaccinations you need.

Vaccine	Do you need it?
Hepatitis A (HepA)	***Maybe.*** You need this vaccine if you have a specific risk factor for hepatitis A virus infection* or simply want to be protected from this disease. The vaccine is usually given in 2 doses, 6–18 months apart.
Hepatitis B (HepB)	***Maybe.*** You need this vaccine if you have a specific risk factor for hepatitis B virus infection* or simply want to be protected from this disease. The vaccine is given in 3 doses, usually over 6 months.
Human papillomavirus (HPV)	***Maybe.*** You need this vaccine if you are a woman age 26 years or younger or a man age 21 years or younger. Men age 22 through 26 years with a risk condition* also need vaccination. Any other man age 22 through 26 who wants to be protected from HPV may receive it, too. The vaccine is given in 3 doses over a 6-month period.
Influenza	***Yes!*** You need a dose every fall (or winter) for your protection and for the protection of others around you.
Measles, mumps, rubella (MMR)	***Maybe.*** You need at least 1 dose of MMR if you were born in 1957 or later. You may also need a 2nd dose.*
Meningococcal (MCV4, MPSV4)	***Maybe.*** You need this vaccine if you have one of several health conditions, or if you are age 19–21 and a first-year college student living in a residence hall and you either have never been vaccinated or were vaccinated before age 16.* †
Pneumococcal (PPSV23 [polysaccharide vaccine]; PCV13 [conjugate vaccine])	***Maybe.*** Adults age 65 years and older should receive the 2 types of pneumococcal vaccines, PCV13 and PPSV23. You should receive a dose of PCV13 first, followed by a dose of the PPSV23, 6 to 12 months later. You might need one or both of these vaccines before age 65 years if you are a smoker or if you have a long-term health condition such as asthma or heart, lung, or kidney disease. Only 1 lifetime dose of PCV13 is recommended for adults; some adults will need more than 1 dose of PPSV23. Talk to your healthcare provider to find out if and when when you need these vaccines.* †
Tetanus, diphtheria, whooping cough (pertussis) (Tdap, Td)	***Yes!*** All adults who have not yet received a dose of Tdap, as an adolescent or adult, need to get Tdap vaccine (the adult whooping cough vaccine). And, all women need to get a dose during each pregnancy. After that, you need a Td booster dose every 10 years. Consult your healthcare provider if you haven't had at least 3 tetanus- and diphtheria-containing shots sometime in your life or if you have a deep or dirty wound.
Varicella (Chickenpox)	***Maybe.*** If you've never had chickenpox or were vaccinated but received only 1 dose, talk to your healthcare provider to find out if you need this vaccine.*
Zoster (shingles)	***Maybe.*** If you are age 60 years or older, you should get a 1-time dose of this vaccine now.
Hib (*Haemophilus influenzae* type b)	***Maybe.*** Some adults with certain high-risk conditions need vaccination with Hib. Talk to your healthcare provider to find out if you need this vaccine.* †

* Consult your healthcare provider to determine your level of risk for infection and your need for this vaccine.
† People who lack a spleen need this vaccine.

Are you planning to travel outside the United States? If so, you may need additional vaccines. The Centers for Disease Control and Prevention (CDC) provides information to assist travelers and their healthcare providers in deciding which vaccines, medications, and other measures are necessary to prevent illness and injury during international travel. Visit CDC's website at wwwnc.cdc.gov/travel/destinations/list, or call 800-CDC-INFO (800-232-4636). You may also consult a travel clinic or your healthcare provider.

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www.immunize.org/catg.d/p4030.pdf • Item #P4030 (2/15)

These documents reflect current ACIP recommendations.

Download, copy, and hand out the entire series widely!

Also available in Spanish

Vaccinations for infants and children, age 0–10 years
www.immunize.org/catg.d/p4019.pdf

Vaccinations for preteens and teens, age 11–19 years
www.immunize.org/catg.d/p4020.pdf

Vaccinations for adults
www.immunize.org/catg.d/p4030.pdf

SPANISH LANGUAGE VERSIONS
www.immunize.org/handouts/vaccine-schedules.asp

Vaccinations for Pregnant Women

The table below shows which vaccinations you should have to protect your health when you are pregnant. Make sure you and your healthcare provider keep your vaccinations up to date.

Vaccine	Do you need it during your pregnancy?
Hepatitis A (HepA)	***Maybe.*** You need this vaccine if you have a specific risk factor for hepatitis A virus infection* or simply want to be protected from this disease. The vaccine is usually given in 2 doses, 6 months apart. It's safe to get this vaccine during pregnancy.
Hepatitis B (HepB)	***Maybe.*** You need this vaccine if you have a specific risk factor for hepatitis B virus infection* or simply want to be protected from this disease. The vaccine is usually given in 3 doses, over a 6-month period. It's safe to get this vaccine during pregnancy. It's important, too, that your newborn baby gets started on his or her hepatitis B vaccination series before leaving the hospital.
Hib (*Haemophilus influenzae* type b)	***Maybe.*** Some adults with certain high-risk conditions need vaccination with Hib vaccine.*
Human papillomavirus (HPV)	***No.*** This vaccine is not recommended to be given during pregnancy, but if you inadvertently receive it, this is not a cause for concern. HPV vaccine is recommended for all women age 26 years or younger, so make sure you are vaccinated before or after your pregnancy. The vaccine is given in 3 doses over a 6-month period.
Influenza	***Yes!*** You need a flu shot every fall (or winter) for your protection and for the protection of your baby and others around you. It's safe to get the vaccine at any time during your pregnancy.
Measles, mumps, rubella (MMR)	***No.*** The MMR vaccine is not recommended to be given during pregnancy, but if you inadvertently receive it, this is not a cause for concern. At least 1 dose of MMR vaccine is recommended for you if you were born in 1957 or later. (And you may need a second dose.*) It's best for you (and any future baby) to receive the protection vaccination provides before trying to conceive.
Meningococcal (MCV4, MPSV4)	***Maybe.*** You need this vaccine if you have one of several health conditions, or if you are 19–21 and a first-year college student living in a residence hall and you either have never been vaccinated or were vaccinated before age 16.* It's safe to get the vaccine during pregnancy.
Pneumococcal (PCV13 [conjugate vaccine]; PPSV23 [polysaccharide vaccine])	***Maybe.*** You need 1 or both of these vaccines if you have a certain risk factor for pneumococcal disease, such as diabetes. If you're unsure of your risk, talk to your healthcare provider to find out if you need this vaccine.* It's safe to get the vaccine during pregnancy.
Tetanus, diphtheria, & whooping cough (pertussis) (Tdap, Td)	***Yes!*** Women who are pregnant need a dose of Tdap vaccine (adult whooping cough vaccine) during each pregnancy, preferably during the third trimester. After that, you'll need a Td booster dose every 10 years. Talk to your healthcare provider if you haven't had at least 3 tetanus- and diphtheria-containing shots sometime in your life or if you have a deep or dirty wound.
Varicella (chickenpox) (VAR)	***No.**** Varicella vaccine is not recommended to be given during pregnancy, but if you inadvertently receive it, this is not a cause for concern. If you haven't been vaccinated or had chickenpox, it's best for you (and any future baby) to be protected with the vaccine before trying to conceive, or after you've completed your pregnancy. The vaccine is given in 2 doses 4–8 weeks apart.

* Consult your healthcare provider to determine your level of risk for infection and your need for this vaccine.

Are you planning to travel outside the United States? If so, you may need additional vaccines. The Centers for Disease Control and Prevention (CDC) provides information to assist travelers and their healthcare providers in deciding which vaccines, medications, and other measures are necessary to prevent illness and injury during international travel. Visit CDC's website at wwwnc.cdc.gov/travel/destinations/list, or call 800-CDC-INFO (800-232-4636). You may also consult a travel clinic or your healthcare provider.

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The American College of Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS

Pneumococcal Vaccination Recommendations for Children[1] and Adults by Age and/or Risk Factor

Routine Recommendations

for Pneumococcal Conjugate Vaccine (PCV13) and Pneumococcal Polysaccharide Vaccine (PPSV23)

For children age 2 months and older	Administer PCV13 series to all children beginning at age 2 months, followed by doses at 4 months, 6 months, and 12–15 months (booster dose).
For adults age 65 years and older	Administer 1-time dose to PCV13-naïve adults at age 65 years, followed by a dose of PPSV23 6–12 months later.

Risk-based Recommendations

People with Underlying Medical Conditions or Other Risk Factors

		PCV13			PPSV23	
Risk Group	**Underlying medical condition or other risk factor**	Administer PCV13 doses needed to complete series to children through age 71 months	Administer 1 dose to PCV13-naïve children age 6 through 18 years	Administer 1 dose to PCV13-naïve adults age 19 through 64 years	Administer 1 dose of PPSV23 at age 2 through 64 years	Administer a second dose of PPSV23 5 years after first dose if age younger than 65 years
Immuno-competent	Chronic heart disease[2]	X			X	
	Chronic lung disease[3]	X			X	
	Diabetes mellitus	X			X	
	Cerebrospinal fluid leak	X	X	X	X	
	Cochlear implant	X	X	X	X	
	Alcoholism				X	
	Chronic liver disease, cirrhosis				X	
	Cigarette smoking (≥19 yrs)				X	
Functional or anatomic asplenia	Sickle cell disease/other hemoglobinopathy	X	X	X	X	X
	Congenital or acquired asplenia	X	X	X	X	X
Immuno-compromised	Congenital or acquired immunodeficiency[4]	X	X	X	X	X
	HIV	X	X	X	X	X
	Chronic renal failure	X	X	X	X	X
	Nephrotic syndrome	X	X	X	X	X
	Leukemia	X	X	X	X	X
	Lymphoma	X	X	X	X	X
	Hodgkin disease	X	X	X	X	X
	Generalized malignancy	X	X	X	X	X
	Iatrogenic immunosuppression[5]	X	X	X	X	X
	Solid organ transplant	X	X	X	X	X
	Multiple myeloma	X	X	X	X	X

1 For PCV13 vaccination of healthy children, see "Recommendations for Pneumococcal Vaccine Use in Children" at www.immunize.org/catg.d/p2016.pdf.

2 Particularly cyanotic congenital heart disease and cardiac failure in children; excluding hypertension in adults.

3 Including asthma in children if treated with high-dose oral corticosteroid therapy; including asthma in adults.

4 Includes B- (humoral) or T-lymphocyte deficiency, complement deficiencies (particularly C1, C2, C3, and C4 deficiencies), and phagocytic disorders (excluding chronic granulomatous disease).

5 Diseases requiring treatment with immunosuppressive drugs, including long-term systemic corticosteroids and radiation therapy.

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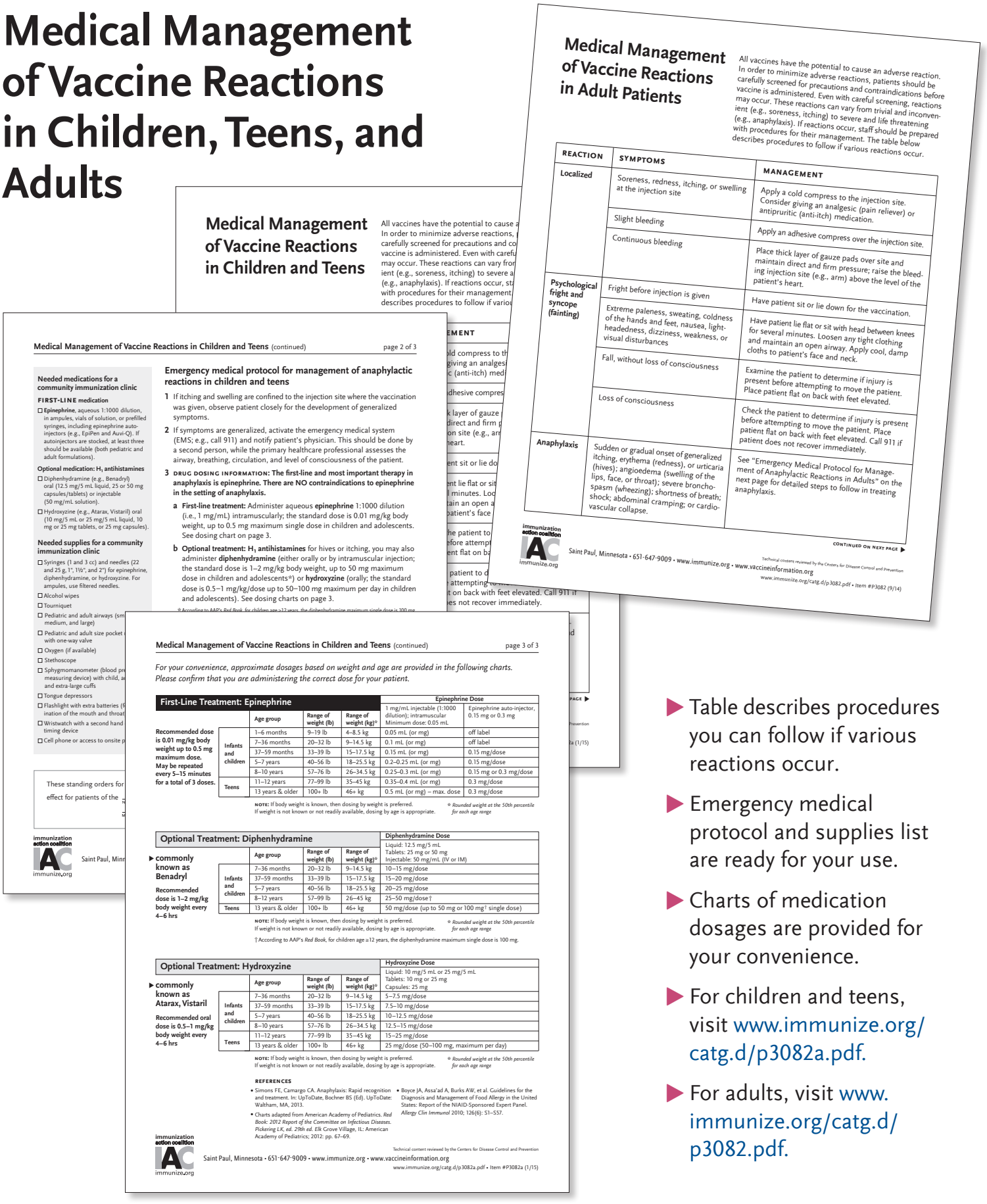
www.immunize.org/catg.d/p2019.pdf ▪ Item #P2019 (2/15)

Medical Management of Vaccine Reactions in Children, Teens, and Adults



Medical Management of Vaccine Reactions in Children and Teens

All vaccines have the potential to cause a
In order to minimize adverse reactions,
carefully screened for precautions and co
vaccine is administered. Even with carefu
may occur. These reactions can vary fro
ient (e.g., soreness, itching) to severe a
(e.g., anaphylaxis). If reactions occur, st
with procedures for their management
describes procedures to follow if variou

Medical Management of Vaccine Reactions in Children and Teens (continued) page 2 of 3

Needed medications for a community immunization clinic

FIRST-LINE medication

- ☐ **Epinephrine**, aqueous 1:1000 dilution, in ampules, vials of solution, or prefilled syringes, including epinephrine auto-injectors (e.g., EpiPen and Auvi-Q). If autoinjectors are stocked, at least three should be available (both pediatric and adult formulations).

Optional medication: H_1 antihistamines

- ☐ Diphenhydramine (e.g., Benadryl) oral (12.5 mg/5 mL liquid, 25 or 50 mg capsules/tablets) or injectable (50 mg/mL solution).
- ☐ Hydroxyzine (e.g., Atarax, Vistaril) oral (10 mg/5 mL or 25 mg/5 mL liquid, 10 mg or 25 mg tablets, or 25 mg capsules).

Needed supplies for a community immunization clinic

- ☐ Syringes (1 and 3 cc) and needles (22 and 25 g, 1", 1½", and 2") for epinephrine, diphenhydramine, or hydroxyzine. For ampules, use filtered needles.
- ☐ Alcohol wipes
- ☐ Tourniquet
- ☐ Pediatric and adult airways (sm medium, and large)
- ☐ Pediatric and adult size pocket with one-way valve
- ☐ Oxygen (if available)
- ☐ Stethoscope
- ☐ Sphygmomanometer (blood pr measuring device) with child, a and extra-large cuffs
- ☐ Tongue depressors
- ☐ Flashlight with extra batteries (f ination of the mouth and throat
- ☐ Wristwatch with a second hand timing device
- ☐ Cell phone or access to onsite p

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Emergency medical protocol for management of anaphylactic reactions in children and teens

1 If itching and swelling are confined to the injection site where the vaccination was given, observe patient closely for the development of generalized symptoms.

2 If symptoms are generalized, activate the emergency medical system (EMS; e.g., call 911) and notify patient's physician. This should be done by a second person, while the primary healthcare professional assesses the airway, breathing, circulation, and level of consciousness of the patient.

3 **DRUG DOSING INFORMATION: The first-line and most important therapy in anaphylaxis is epinephrine. There are NO contraindications to epinephrine in the setting of anaphylaxis.**

a **First-line treatment:** Administer aqueous **epinephrine** 1:1000 dilution (i.e., 1 mg/mL) intramuscularly; the standard dose is 0.01 mg/kg body weight, up to 0.5 mg maximum single dose in children and adolescents. See dosing chart on page 3.

b **Optional treatment: H_1 antihistamines** for hives or itching, you may also administer **diphenhydramine** (either orally or by intramuscular injection; the standard dose is 1–2 mg/kg body weight, up to 50 mg maximum dose in children and adolescents*) or **hydroxyzine** (orally; the standard dose is 0.5–1 mg/kg/dose up to 50–100 mg maximum per day in children and adolescents). See dosing charts on page 3.

* According to AAP's *Red Book*, for children age ≥12 years, the diphenhydramine maximum single dose is 100 mg.

Medical Management of Vaccine Reactions in Children and Teens (continued) page 3 of 3

For your convenience, approximate dosages based on weight and age are provided in the following charts. Please confirm that you are administering the correct dose for your patient.

First-Line Treatment: Epinephrine

Recommended dose is 0.01 mg/kg body weight up to 0.5 mg maximum dose. May be repeated every 5–15 minutes for a total of 3 doses.

	Age group	Range of weight (lb)	Range of weight (kg)*	Epinephrine Dose: 1 mg/mL injectable (1:1000 dilution); intramuscular Minimum dose: 0.05 mL	Epinephrine auto-injector, 0.15 mg or 0.3 mg
Infants and children	1–6 months	9–19 lb	4–8.5 kg	0.05 mL (or mg)	off label
	7–36 months	20–32 lb	9–14.5 kg	0.1 mL (or mg)	off label
	37–59 months	33–39 lb	15–17.5 kg	0.15 mL (or mg)	0.15 mg/dose
	5–7 years	40–56 lb	18–25.5 kg	0.2–0.25 mL (or mg)	0.15 mg/dose
	8–10 years	57–76 lb	26–34.5 kg	0.25–0.3 mL (or mg)	0.15 mg or 0.3 mg/dose
Teens	11–12 years	77–99 lb	35–45 kg	0.35–0.4 mL (or mg)	0.3 mg/dose
	13 years & older	100+ lb	46+ kg	0.5 mL (or mg) – max. dose	0.3 mg/dose

NOTE: If body weight is known, then dosing by weight is preferred. If weight is not known or not readily available, dosing by age is appropriate.

* *Rounded weight at the 50th percentile for each age range*

Optional Treatment: Diphenhydramine

▶ commonly known as Benadryl

Recommended dose is 1–2 mg/kg body weight every 4–6 hrs

	Age group	Range of weight (lb)	Range of weight (kg)*	Diphenhydramine Dose: Liquid: 12.5 mg/5 mL Tablets: 25 mg or 50 mg Injectable: 50 mg/mL (IV or IM)
Infants and children	7–36 months	20–32 lb	9–14.5 kg	10–15 mg/dose
	37–59 months	33–39 lb	15–17.5 kg	15–20 mg/dose
	5–7 years	40–56 lb	18–25.5 kg	20–25 mg/dose
	8–12 years	57–99 lb	26–45 kg	25–50 mg/dose†
Teens	13 years & older	100+ lb	46+ kg	50 mg/dose (up to 50 mg or 100 mg† single dose)

NOTE: If body weight is known, then dosing by weight is preferred. If weight is not known or not readily available, dosing by age is appropriate.

* *Rounded weight at the 50th percentile for each age range*

† According to AAP's *Red Book*, for children age ≥12 years, the diphenhydramine maximum single dose is 100 mg.

Optional Treatment: Hydroxyzine

▶ commonly known as Atarax, Vistaril

Recommended oral dose is 0.5–1 mg/kg body weight every 4–6 hrs

	Age group	Range of weight (lb)	Range of weight (kg)*	Hydroxyzine Dose: Liquid: 10 mg/5 mL or 25 mg/5 mL Tablets: 10 mg or 25 mg Capsules: 25 mg
Infants and children	7–36 months	20–32 lb	9–14.5 kg	5–7.5 mg/dose
	37–59 months	33–39 lb	15–17.5 kg	7.5–10 mg/dose
	5–7 years	40–56 lb	18–25.5 kg	10–12.5 mg/dose
	8–10 years	57–76 lb	26–34.5 kg	12.5–15 mg/dose
Teens	11–12 years	77–99 lb	35–45 kg	15–25 mg/dose
	13 years & older	100+ lb	46+ kg	25 mg/dose (50–100 mg, maximum per day)

NOTE: If body weight is known, then dosing by weight is preferred. If weight is not known or not readily available, dosing by age is appropriate.

* *Rounded weight at the 50th percentile for each age range*

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www.immunize.org/catg.d/p3082a.pdf • Item #P3082a (1/15)

Medical Management of Vaccine Reactions in Adult Patients

All vaccines have the potential to cause an adverse reaction. In order to minimize adverse reactions, patients should be carefully screened for precautions and contraindications before vaccine is administered. Even with careful screening, reactions may occur. These reactions can vary from trivial and inconvenient (e.g., soreness, itching) to severe and life threatening (e.g., anaphylaxis). If reactions occur, staff should be prepared with procedures for their management. The table below describes procedures to follow if various reactions occur.

REACTION	SYMPTOMS	MANAGEMENT
Localized	Soreness, redness, itching, or swelling at the injection site	Apply a cold compress to the injection site. Consider giving an analgesic (pain reliever) or antipruritic (anti-itch) medication.
	Slight bleeding	Apply an adhesive compress over the injection site.
	Continuous bleeding	Place thick layer of gauze pads over site and maintain direct and firm pressure; raise the bleeding injection site (e.g., arm) above the level of the patient's heart.
Psychological fright and syncope (fainting)	Fright before injection is given	Have patient sit or lie down for the vaccination.
	Extreme paleness, sweating, coldness of the hands and feet, nausea, lightheadedness, dizziness, weakness, or visual disturbances	Have patient lie flat or sit with head between knees for several minutes. Loosen any tight clothing and maintain an open airway. Apply cool, damp cloths to patient's face and neck.
	Fall, without loss of consciousness	Examine the patient to determine if injury is present before attempting to move the patient. Place patient flat on back with feet elevated.
	Loss of consciousness	Check the patient to determine if injury is present before attempting to move the patient. Place patient flat on back with feet elevated. Call 911 if patient does not recover immediately.
Anaphylaxis	Sudden or gradual onset of generalized itching, erythema (redness), or urticaria (hives); angioedema (swelling of the lips, face, or throat); severe bronchospasm (wheezing); shortness of breath; shock; abdominal cramping; or cardiovascular collapse.	See "Emergency Medical Protocol for Management of Anaphylactic Reactions in Adults" on the next page for detailed steps to follow in treating anaphylaxis.

CONTINUED ON NEXT PAGE ▶

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www.immunize.org/catg.d/p3082.pdf • Item #P3082 (9/14)

- Table describes procedures you can follow if various reactions occur.
- Emergency medical protocol and supplies list are ready for your use.
- Charts of medication dosages are provided for your convenience.
- For children and teens, visit www.immunize.org/catg.d/p3082a.pdf.
- For adults, visit www.immunize.org/catg.d/p3082.pdf.

Handy VIS reference charts are ready to print, cut out, and use in your medical setting!

Current Dates of Vaccine Information Statements (VISs) as of April 24, 2015

Check your supply of VISs against this list. If you have outdated VISs, get current versions at www.immunize.org/vis.

Adenovirus	6/11/14	**MMRV**	5/21/10
Anthrax	3/10/10	**Meningococcal**	10/14/11
Chickenpox	3/13/08	**Multi-vaccine**	10/22/14
DTaP	5/17/07	**PCV13**	2/27/13
Hib	4/2/15	**PPSV**	4/24/15
Hepatitis A	10/25/11	**Polio**	11/8/11
Hepatitis B	2/2/12	**Rabies**	10/6/09
HPV-Cervarix	5/3/11	**Rotavirus**	4/15/15
HPV-Gardasil	5/17/13	**Shingles**	10/6/09
HPV-Gardasil 9	4/15/15	**Td**	2/24/15
Influenza	8/19/14	**Tdap**	2/24/15
Japanese enceph	1/24/14	**Typhoid**	5/29/12
MMR	4/20/12	**Yellow fever**	3/30/11

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Current Dates of Vaccine Information Statements (VISs) as of April 24, 2015

Check your supply of VISs against this list. If you have outdated VISs, get current versions at www.immunize.org/vis.

Adenovirus	6/11/14	**MMRV**	5/21/10
Anthrax	3/10/10	**Meningococcal**	10/14/11
Chickenpox	3/13/08	**Multi-vaccine**	10/22/14
DTaP	5/17/07	**PCV13**	2/27/13
Hib	4/2/15	**PPSV**	4/24/15
Hepatitis A	10/25/11	**Polio**	11/8/11
Hepatitis B	2/2/12	**Rabies**	10/6/09
HPV-Cervarix	5/3/11	**Rotavirus**	4/15/15
HPV-Gardasil	5/17/13	**Shingles**	10/6/09
HPV-Gardasil 9	4/15/15	**Td**	2/24/15
Influenza	8/19/14	**Tdap**	2/24/15
Japanese enceph	1/24/14	**Typhoid**	5/29/12
MMR	4/20/12	**Yellow fever**	3/30/11

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Current Dates of Vaccine Information Statements (VISs) as of April 24, 2015

Check your supply of VISs against this list. If you have outdated VISs, get current versions at www.immunize.org/vis.

Adenovirus	6/11/14	**MMRV**	5/21/10
Anthrax	3/10/10	**Meningococcal**	10/14/11
Chickenpox	3/13/08	**Multi-vaccine**	10/22/14
DTaP	5/17/07	**PCV13**	2/27/13
Hib	4/2/15	**PPSV**	4/24/15
Hepatitis A	10/25/11	**Polio**	11/8/11
Hepatitis B	2/2/12	**Rabies**	10/6/09
HPV-Cervarix	5/3/11	**Rotavirus**	4/15/15
HPV-Gardasil	5/17/13	**Shingles**	10/6/09
HPV-Gardasil 9	4/15/15	**Td**	2/24/15
Influenza	8/19/14	**Tdap**	2/24/15
Japanese enceph	1/24/14	**Typhoid**	5/29/12
MMR	4/20/12	**Yellow fever**	3/30/11

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Current Dates of Vaccine Information Statements (VISs) as of April 24, 2015

Check your supply of VISs against this list. If you have outdated VISs, get current versions at www.immunize.org/vis.

Adenovirus	6/11/14	**MMRV**	5/21/10
Anthrax	3/10/10	**Meningococcal**	10/14/11
Chickenpox	3/13/08	**Multi-vaccine**	10/22/14
DTaP	5/17/07	**PCV13**	2/27/13
Hib	4/2/15	**PPSV**	4/24/15
Hepatitis A	10/25/11	**Polio**	11/8/11
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HPV-Gardasil 9	4/15/15	**Td**	2/24/15
Influenza	8/19/14	**Tdap**	2/24/15
Japanese enceph	1/24/14	**Typhoid**	5/29/12
MMR	4/20/12	**Yellow fever**	3/30/11

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The Vaccine Handbook: A Practical Guide for Clinicians

New! The fifth edition has been extensively updated for 2015.

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FROM THE FOREWORD:

The Purple Book *belongs in the hands of every medical student, physician-in-training, doctor, nursing student, and nurse who provides vaccines to patients, regardless of patient age or medical specialty. It is my honor to introduce the Fifth Edition to you. This essential reference beautifully supports all of us in our efforts to move forward in protecting our patients from the consequences of preventable diseases.*

Deborah L. Wexler, MD
Executive Director
Immunization Action Coalition

About the Author

Gary Marshall, MD, is professor of pediatrics at the University of Louisville School of Medicine in Kentucky, where he serves as chief of the division of pediatric infectious diseases and director of the Pediatric Clinical Trials Unit. In addition to being a busy clinician, he is nationally known for his work in the areas of vaccine research, advocacy, and education.

The Reviews

This book gives clinicians a well-organized and efficient one-stop source for information on immunizations and vaccine preventable diseases.
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– Deborah L. Wexler, MD
Executive Director,
Immunization Action Coalition

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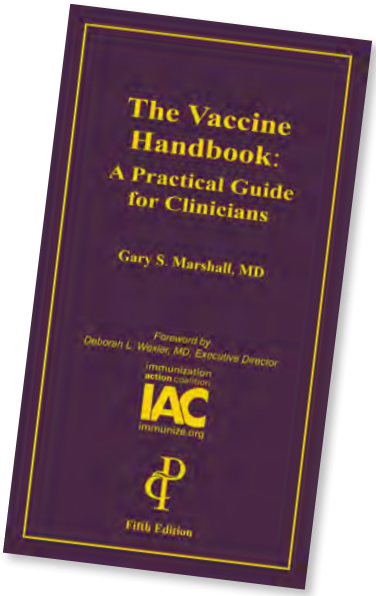

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the laboratory setting, proper infection control should be instituted including, at minimum, biosafety level 2. Whether HPV vaccination would be of benefit in these settings is unclear because no data exist on transmission risk or vaccine efficacy in this situation.

Please summarize information about Merck's new 9-valent HPV vaccine (9vHPV, Gardasil 9).
9vHPV contains the four HPV types in 4vHPV (Gardasil; 16, 18, 6, and 11) and 5 additional "high risk" types (31, 33, 45, 52, and 58). It was licensed by the U.S. Food and Drug Administration (FDA) on December 10, 2014. 9vHPV is approved for use in females 9 through 26 years and males 9 through 15 years (Merck has subsequently submitted clinical trial data to the FDA for males 16 through 26 years of age). 9vHPV has the same schedule as 4vHPV (three intramuscular doses spaced 0, 1, and 6 months apart). In a clinical trial comparing 9vHPV to 4vHPV, 9vHPV reduced the risk of disease caused by the 5 additional strains by 97%. ACIP states that clinicians can administer either 4vHPV or 9vHPV to males through age 26 years to complete the HPV vaccine series.

With the availability of 9vHPV, has the ACIP changed its recommendations for HPV vaccines?
The ACIP recommendations for HPV vaccination have not changed. ACIP recommends that routine HPV vaccination be initiated for females and males at age 11 or 12 years. The vaccination series can be started as early as age 9 years. Vaccination is also recommended for females aged 13 through 26 years and for males aged 13 through 21 years who have not been vaccinated previously or who have not completed the 3-dose series. In addition, vaccination is recommended for men age 22 through age 26 years who 1) have sex with men or 2) are immunocompromised as a result of infection (including HIV), disease, or medication. Other males 22 through 26 years of age may be vaccinated at the clinician's discretion.

Vaccination of females is recommended with 2vHPV (Ceravix, GlaxoSmithKline), 4vHPV (as long as this formulation is available), or 9vHPV. Vaccination of males is recommended with 4vHPV (as long as this formulation is available) or 9vHPV. Ideally, HPV vaccine should be administered before potential exposure to HPV through sexual contact.

All 3 HPV vaccines should be given as a 3-dose schedule, with the second dose given 1 to 2 months after the first dose and the third dose 6 months after the first dose.

The 2014 ACIP recommendations are available at www.cdc.gov/mmwr/pdf/rr/rr6305.pdf (covers 2vHPV and 4vHPV), and the newly released 2015 ACIP recommendations (published March 27, 2015) are at www.cdc.gov/mmwr/pdf/wk/mm6411.pdf, pages 300–304 (covers 9vHPV).

Can an HPV vaccine series begun with 2vHPV or 4vHPV be completed with 9vHPV?
Yes. Any available HPV vaccine may be used to continue or complete the series for females. 9vHPV or 4vHPV may be used to continue or complete the series for males. However, receiving fewer than 3 doses of 4vHPV or 9vHPV may provide less protection against genital warts caused by HPV types 6 and 11 than the usual 3-dose series. There are no data on the efficacy of the 5 additional HPV types included in 9vHPV if the person receives fewer than 3 doses.

Does ACIP recommend revaccination with 9vHPV for patients who previously received a series of 2vHPV or 4vHPV?
ACIP has not recommended routine revaccination with 9vHPV for persons who have completed a series of another HPV vaccine. There are data that indicate revaccination with 9vHPV after a series of 4vHPV is safe. Clinicians should decide if the benefit of immunity against 5 additional oncogenic strains of HPV is justified for their patients.

Is 9vHPV included in the Vaccines For Children (VFC) program?
Yes.

Do women and men whose sexual orientation is same-sex need HPV vaccine?
Yes. HPV vaccine is recommended for females and males regardless of their sexual orientation.

If a dose of HPV vaccine is significantly delayed, do I need to start the series over?
No, do not restart the series. You should continue where the patient left off and complete the series.

To accelerate completion of the HPV vaccine series, can doses be given at 0, 1, and 4 months?
No, there is no accelerated schedule for completing the HPV vaccine series. You should follow the recommended schedule of 0, 1–2, and 6 months.

What are the minimum intervals between doses of HPV vaccine?
Minimum intervals are used when patients have fallen behind on their immunization schedule or when they need their dosing schedule expedited (for example, if there is imminent travel). The minimum interval between the first and second doses of HPV vaccine is 4 weeks. The minimum interval between the second and third dose is 12 weeks. ACIP recommends an interval of 24 weeks between the first and third dose. However, the third dose can be considered to be valid if it was separated from the first dose by at least 16 weeks and from the second dose by at least 12 weeks.

If HPV vaccine is given subcutaneously instead of intramuscularly, does the dose need to be repeated?
Yes. No data exist on the efficacy or safety of HPV vaccine given by the subcutaneous route. All data on efficacy and duration of protection are based on a 3-dose series given on the approved schedule and administered by the intramuscular route. In the absence of data on subcutaneous administration, the Centers for Disease Control and Prevention (CDC) and the manufacturers recommend that a dose of HPV vaccine given by any route other than intramuscular should be repeated. There is no minimum interval between the invalid (subcutaneous) dose and the repeat dose.

If a patient has been sexually active for a number of years, is it still recommended to give HPV vaccine or to complete the HPV vaccine series?
Yes. HPV vaccine should be administered to people who are already sexually active. Ideally, patients should be vaccinated before onset of sexual activity; however, patients who have already been infected with one or more HPV types still get protection from other HPV types in the vaccine that have not been acquired.

I read that HPV vaccination rates are still low. What can we do as providers to improve these rates?
Coverage levels for HPV vaccine are improving but are still inadequate. Results from the CDC's 2013 National Immunization Survey-Teen (NIS-Teen) indicate that HPV vaccination rates in girls age 13 through 17 years increased between 2012 and 2013. Just over 57% of girls age 13 through 17 years had started the series that they should have completed by age 13 years and 38% had completed the series. In 2013, 35% of boys age 13 through 17 years had received one dose but only 14% had received all three recommended doses. A summary of the 2013 NIS-Teen survey is available at www.cdc.gov/mmwr/pdf/wk/mm6329.pdf, page 625–633.

Providers can improve uptake of this life-saving

Ask the Experts . . . *continued on page 23* ▶

IAC's "Ask the Experts" team from the Centers for Disease Control and Prevention


Andrew T. Kroger, MD, MPH


Donna L. Weaver, RN, MN

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Ask the Experts… *continued from page 22*

vaccine in two main ways. First, studies have shown that missed opportunities are a big problem. Up to 88% (depending on year of birth) of girls unvaccinated for HPV had a healthcare visit where they received another vaccine such as Tdap, but not HPV. If HPV vaccine had been administered at the same visit, vaccination coverage for one or more doses could be 91% instead of 57%. Second, the 2013 NIS-Teen data show that not receiving a healthcare provider's recommendation for HPV vaccine was one of the five main reasons parents reported for not vaccinating their daughters and the number one reason for not vaccinating their sons.

CDC urges healthcare providers to increase the consistency and strength of how they recommend HPV vaccine, especially when patients are age 11 or 12 years. The following resources can help providers with these conversations.

• CDC's "Tips and Time-savers for Talking with Parents about HPV Vaccine," available at www.cdc.gov/vaccines/who/teens/for-hcp-tipsheet-hpv.pdf

• IAC's "Human Papillomavirus HPV: A Parent's Guide to Preteen and Teen HPV Vaccination," available at www.immunize.org/catg.d/p4250.pdf

For more detailed information about HPV vaccination strategies for providers, visit www.cdc.gov/vaccines/who/teens/for-hcp/hpv-resources.html.

If a 30-year-old female patient insists that she wants to receive HPV vaccine, can I give it to her?

HPV vaccine is not FDA-licensed for use in women older than age 26 years. Studies have shown that the vaccine is safe in women age 27 years and older. ACIP does not recommend the use of this vaccine outside the FDA licensing guidelines unless the series was started but not completed by age 26 years. Clinicians may choose to administer HPV vaccine off-label to men and women age 27 years or older.

What adverse events can be expected following HPV vaccine?

In clinical trials involving more than 35,000 subjects, the most common adverse event was injection site pain, which was reported in 58% to 90% of recipients (depending on vaccine and dose number). Other local reactions, such as redness and/or swelling, were reported in 30% to 40% of recipients. Local reactions were reported more frequently among 9vHPV recipients than among 4vHPV recipients, probably because of the larger amount of aluminum adjuvant present in 9vHPV. Systemic reaction, such as fever, headache, and fatigue, were reported by 2% to 50% of recipients (depending on vaccine and dose number). These symptoms generally occurred at about the same rate in vaccine and placebo recipients.

Do HPV vaccines cause fainting?

Nearly all vaccines have been reported to be associated with fainting (syncope). Post-vaccination syncope has been most frequently reported after receipt of any of the three vaccines commonly given to adolescents (HPV, MCV4, and Tdap). However, it is not known whether the vaccines are responsible for post-vaccination syncope or if the association with these vaccines simply reflects the fact that adolescents are generally more likely to experience syncope.

Syncope can cause serious injury. Falls that occur due to syncope after vaccination can be prevented by having the vaccinated person seated or lying down. The person should be observed for 15 minutes following vaccination.

MMR vaccine

In regard to the current measles outbreak, some people are saying that children who have not had the vaccine should pose no threat to vaccinated people. It is my understanding that during an outbreak, vaccinated people can still contract it. Am I correct?

You are correct that vaccinated people can still be infected with infections against which they are vaccinated. No vaccine is 100% effective. Vaccine effectiveness varies from greater than 95% (for diseases such as measles, rubella, hepatitis B) to much lower (influenza this year 23%, and 60% in years with a good match of wild and vaccine viruses, and the acellular pertussis vaccines after 5 years or so offer only about 70% protection). Therefore, we encourage as many people as possible to be vaccinated to avoid outbreaks, while working towards the development of better vaccines (such as for influenza and pertussis). More information is available for each vaccine and disease at www.cdc.gov/vaccines/vpd-vac/default.htm and www.immunize.org/vaccines.

We received a call from a healthcare provider who inadvertently administered MMR vaccine to a woman who was 2 months pregnant. Please advise as to appropriate action steps.

No specific action needs to be taken other than to reassure the woman that no adverse outcomes are expected as a result of this vaccination. MMR vaccination during pregnancy alone is not a reason to terminate a pregnancy. You should consult with the provider to determine if there is a way to avoid such vaccination errors in the future. Detailed information about MMR vaccination in pregnancy is included in the most recent MMR ACIP statement, available at www.cdc.gov/mmwr/pdf/rr/rr6204.pdf.

To find more than 1,000 "Ask the Experts" Q&As answered by CDC experts, visit www.immunize.org/askexperts

Hepatitis B vaccine

If an infant got a dose of the adult formulation of hepatitis B vaccine in error, should the dose be counted? When should the next dose be scheduled for this infant? Do we need to be concerned about a possible adverse event?

If an infant received an adult dose of hepatitis B vaccine (contains twice the antigen in a dose of the infant/child formulation), the dose can be counted as valid and does not need to be repeated. Hepatitis B vaccine is a very safe vaccine and no unusual adverse events would be expected because of this administration error. The next (age appropriate) dose should be given on the usual schedule.

Meningococcal vaccine

We have a 65-year-old male seeking vaccination due to international travel. Meningococcal polysaccharide vaccine (MPSV4, Menomune, Sanofi Pasteur) is unavailable, and we aren't sure when we can get it. How should we proceed? Is this a circumstance in which a conjugate vaccine is appropriate at his age?

ACIP recommends off-label use of quadrivalent meningococcal conjugate vaccine (MCV4: Menactra, Sanofi Pasteur; Menveo, GlaxoSmithKline) in adults age 56 years and older who (1) were vaccinated previously with MCV4 and now need revaccination or (2) are recommended to receive multiple doses (e.g., adults with asplenia, microbiologists working with *Neisseria meningitidis*). Although MPSV4 is recommended in the situation you describe, it is acceptable to use MCV4 if MPSV4 is not available.

Asplenia and vaccines

Do any of the bacterial vaccines that are recommended for people with functional or anatomic asplenia need to be given before splenectomy? Do the doses count if they are given during the 2 weeks prior to surgery?

Pneumococcal conjugate vaccine (PCV13, Prevnar 13, Pfizer), *Haemophilus influenzae* type b vaccine (Hib), meningococcal conjugate vaccine (MCV4), and meningococcal B vaccine should be given 14 days before splenectomy, if possible. Doses given during the 2 weeks (14 days) before surgery can be counted as valid. If the doses cannot be given prior to the splenectomy, they should be given as soon as the patient's condition has stabilized after surgery. Pneumococcal polysaccharide vaccine (PPSV23, Pneumovax, Merck) should be administered 8 weeks after the dose of PCV13 for people 2 years of age and older.

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