

NEEDLE TIPS

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Dr. William L. Atkinson, Immunization Legend, Retiring from CDC

After 25 years of service, Dr. William (Bill) L. Atkinson will be retiring from the Centers for Disease Control and Prevention's (CDC) National Center for Immunization and Respiratory Diseases (NCIRD) at the end of June. Well known to readers of the popular *Needle Tips* column "Ask the Experts," Dr. Atkinson has had tremendous impact on the U.S. immunization program during his career. The following tributes from Dr. Larry K. Pickering and Dr. Deborah L. Wexler attest to the significance of Dr. Atkinson's tenure of service at CDC.

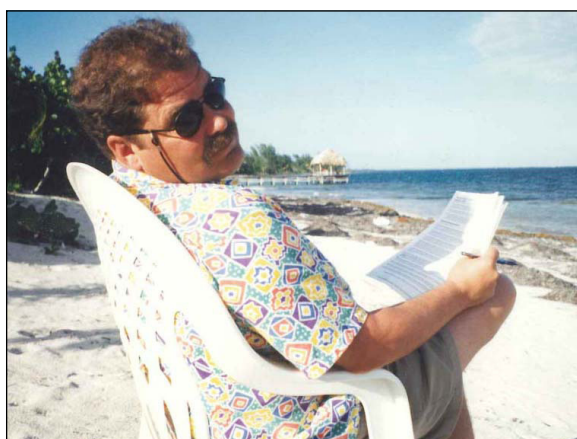
Larry K. Pickering, MD, FAAP, senior advisor to the director of NCIRD and executive secretary of

the Advisory Committee on Immunization Practices (ACIP), honored Dr. Atkinson at the February 2012 ACIP meeting. The following paragraphs are adapted from Dr. Pickering's speech at ACIP. Dr. Wexler's accolades follow Dr. Pickering's.

Following training in psychology, medicine, and epidemiology, and board certification in internal medicine and preventive medicine, Bill arrived at CDC in 1983 as an Epidemic Intelligence Service (EIS) officer. Following his two-year assignment as an EIS officer, he served at the Louisiana State Health Department in New Orleans and was on the faculty of the Tulane University School of Public Health and Tropical Medicine until 1989, when he moved to Atlanta.

From 1989 through 1994, he was responsible for measles surveillance and outbreak investigation for what was then known as the National Immunization Program. He was the point person for measles during the major resurgence of 1989 through 1991.

The first ACIP statement Bill wrote was the noteworthy 1989 recommendation on measles prevention. It made a significant change in the childhood immunization schedule by recommending two doses of measles-containing



On the beach reviewing "Ask the Experts," Xcalak, Mexico, Dec. 1999

(continued on page 5)

Ask the Experts

IAC extends thanks to our experts, medical epidemiologist Andrew T. Kroger, MD, MPH; nurse educator Donna L. Weaver, RN, MN; medical officer Iyabode Akinsanya-Beysolow, MD, MPH; and medical epidemiologist William L. Atkinson, MD, MPH. All are with the National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention (CDC).

Immunization questions?

- Call the CDC-INFO Contact Center at (800) 232-4636 or (800) CDC-INFO
- Email nipinfo@cdc.gov
- Call your state health dept. (phone numbers at www.immunize.org/coordinators)

Immunization questions

Please review the new recommendations for the use of Tdap in people 65 years and older.

At its February 2012 meeting, the Advisory Committee on Immunization Practices (ACIP) voted to recommend Tdap for adults age 65 years and older. CDC posted the provisional recommendations on its website on March 21 at www.cdc.gov/vaccines/recs/provisional/downloads/Tdap-feb2012.pdf.

Two Tdap vaccines are currently licensed in the United States. They are Boostrix (GSK), approved for use in people age 10 years and older, and Adacel (sanofi pasteur) approved for use in people age 11 through 64 years.

The provisional recommendations state the following:

- Give a single dose of Tdap to previously unvaccinated adults age 19 years and older.
- Give the Tdap dose regardless of the interval since the person last received a tetanus or diphtheria toxoid-containing vaccine.

- Give the Tdap dose to adults for whom it is recommended if no record of previous administration exists.

Do not miss an opportunity to give Tdap to people age 65 years and older. Administer the vaccine you have available—either Boostrix or Adacel. When feasible, give Boostrix to adults age 65 and older. However, either vaccine product provides

(continued on page 5)

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Immunization Action Coalition

New! "Cocooning and Tdap Vaccination" Web Section on immunize.org

Newborns have the highest rates of death from pertussis (whooping cough) because they are too young to be vaccinated against the disease. A vaccination strategy called "cocooning" involves protecting newborns by vaccinating their close contacts against pertussis with Tdap vaccine. Close contacts include parents, siblings, grandparents, other family members, family friends, child care providers, and healthcare staff. To provide one-step access to information on cocooning, IAC has developed a web section titled [Cocooning and Tdap Vaccination](http://immunize.org/cocooning).

IAC's new web section brings together resources from multiple sources, including the Centers for Disease Control and Prevention (CDC), state health departments, professional societies, medical journals, and blogs. You'll find helpful vaccination-related resources, such as Advisory Committee on Immunization Practices (ACIP) recommendations, a cocooning handbook for healthcare providers, pertussis videos, selected journal articles, patient handouts, PowerPoint presentations, and much more. You can access the new cocooning web section from the index at the bottom of IAC's home page, "Guide to immunize.org," or by using IAC's search engine.

PERTUSSIS VIDEOS

Because video is such a compelling and popular medium, IAC is featuring a [collection of videos](#) about pertussis and the importance of Tdap vaccination. The pertussis-related videos include videos of pertussis cough in infants and children; educational information for healthcare professionals from expert commentators; personal testimonies from parents who have suffered the tragic loss of their babies to pertussis; recent broadcast news coverage; and public service announcements about the importance of Tdap vaccination for the close contacts of infants. The featured videos are from the following organizations: California Immunization Coalition's Shot-by-Shot website, CDC, March of Dimes, Medscape, Michigan Department of Community Health, PKIDs, and Texas Department of State Health Services.



JOURNAL ARTICLES AND BLOGS

Be sure to check out IAC's selection of key medical journal articles on cocooning, as well as two timely blog postings. One post (PKIDs.org), which covers the diagnosis of pertussis, is written by James Cherry, MD, MSc, Distinguished Professor of Pediatrics, David Geffen School of Medicine at UCLA. The second blog, Seattle Mama Doc, is written by Wendy Sue Swanson, MD. It offers an email message template for parents to send to family and friends on the importance of getting a Tdap vaccination well ahead of visiting their new infant.

We also suggest you subscribe to our weekly email news service, *IAC Express*. Once you complete the sign-up form at www.immunize.org/subscribe, you'll start receiving email announcements about important developments related to immunization.

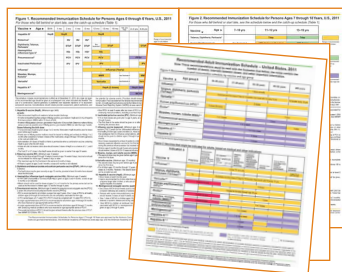
Visit the Immunization Action Coalition's website often! www.immunize.org

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

Here are the ACIP/AAP/AAPF-approved immunization schedule for people ages 0 through 18 years and the ACIP/AAP/ACOG/ACNM-approved schedule for adults. Both are laminated and washable for heavy-duty use, complete with essential footnotes, and printed in color for easy reading. The cost is \$7.50 for each schedule and only \$5.50 each for five or more copies.



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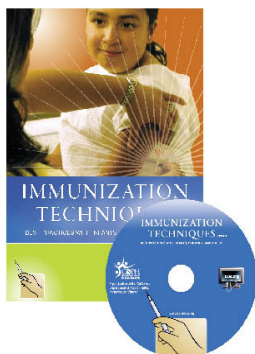
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"Immunization Techniques — Best Practices with Infants, Children, and Adults"



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. Make sure your healthcare setting has the 2010 edition!

The cost is \$17 each for 1–9 copies; \$10.25 each for 10–24 copies; \$7 each for 25–49 copies; \$5.75 each for 50–99 copies.

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Vaccine Highlights

Recommendations, schedules, and more

Editor's note: The information in Vaccine Highlights is current as of May 8, 2012.

The next ACIP meetings

A committee of 15 national experts, the Advisory Committee on Immunization Practices (ACIP) advises CDC on the appropriate use of vaccines. ACIP meets three times a year in Atlanta; meetings are open to the public. The next meetings will be held on June 20–21 and October 24–25. For more information, visit www.cdc.gov/vaccines/recs/acip.

ACIP periodically issues public health recommendations on the use of vaccines. Clinicians who vaccinate should have a current set for reference. Published in the *Morbidity and Mortality Weekly Report (MMWR)*, ACIP recommendations are easily available. Here are sources:

- Download them from links on IAC's website: www.immunize.org/acip.
- Download them from CDC's website: www.cdc.gov/vaccines/pubs/acip-list.htm.

CDC vaccine news

On March 21, CDC posted "ACIP Provisional Tdap Recommendations." They reflect ACIP's February 22 vote to extend the age for Tdap vaccination to include all adults age 65 years and older. For details, see the "Ask the Experts" column on page 1.

To access the provisional recommendations, go to www.cdc.gov/vaccines/recs/provisional/Tdap-feb2012.htm. ACIP provisional recommendations become CDC recommendations once they are accepted by the director of CDC and the Secretary of Health and Human Services and are published in *MMWR*.

On Feb. 10, CDC published "Recommended Immunization Schedules for Persons Aged 0 Through 18 Years—U.S., 2012." Issued jointly by ACIP, AAP, and AAFP, it is available at www.cdc.gov/vaccines/recs/schedules/child-schedule.htm. This issue of *Needle Tips* includes a reformatted version on pages 6–8.

In March, CDC began advising vaccination providers to be sure to use all three pages of the child and teen immunization schedule. To help providers do this, CDC combined its three schedules and all footnotes into a single 4-page document. To access it, go to www.cdc.gov/vaccines/recs/schedules/downloads/child/0-18yrs-11x17-fold-pr.pdf.

On Feb. 3, CDC published "Recommended Adult Immunization Schedule—U.S., 2012." Issued jointly by ACIP, AAFP, ACOG, ACP, and ACNM, it is available at www.cdc.gov/vaccines/recs/sched-

[ules/adult-schedule.htm](http://www.immunize.org/needletips/adult-schedule.htm). This issue of *Needle Tips* includes a reformatted version on pages 9–11.

IAC has developed laminated 6-page color versions of both 2012 immunization schedules, the child and teen as well as the adult. They are available for purchase. For more information, visit www.immunize.org/shop/laminated-schedules.asp.

VIS news

Starting April 24, CDC will add a 2D barcode to newly released and updated VISs. The barcode will allow providers with a 2D barcode reader and the appropriate software to scan the VIS name and edition date into an electronic medical record or Immunization Information System (IIS; formerly known as an *immunization registry*). Using the barcode is an optional alternative to entering this information manually. CDC will locate barcodes on the back of the VIS near the edition date. The MMR vaccine VIS (discussed below) is the first VIS to feature a 2D barcode. For additional information, see CDC's barcode web page at www.cdc.gov/vaccines/pubs/vis/vis-barcodes.htm.

On April 20, CDC released an updated edition of the VIS for MMR vaccine. To access it, go to www.immunize.org/vis/vis_mmr.asp.

On Feb. 22, CDC released an updated VIS for Gardasil quadrivalent human papillomavirus (HPV; Merck) vaccine. (The VIS for Cervarix bivalent HPV vaccine [GSK] has not been updated.) To access the VIS for Gardasil vaccine and its 13 new translations, go to www.immunize.org/vis/vis_hpv_gardasil.asp.

On Feb. 2, CDC released a revised interim edition of the VIS for hepatitis B vaccine. The revision includes the new ACIP recommendations for vaccinating adults with diabetes. To access it and its 12 new translations, go to www.immunize.org/vis/vis_hepatitis_b.asp.

FDA vaccine news

On Feb. 29, FDA issued a press release announcing that it has approved the first quadrivalent vaccine to prevent seasonal influenza. A live attenuated vaccine, FluMist Quadrivalent (manufactured by MedImmune) contains four strains of the influenza virus—two influenza A strains and two influenza B strains. It is approved for use in people age 2 through 49 years. The FDA press release is available at www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm294057.htm.

On March 30, *MMWR* published "FDA Approval of an Extended Period for Administering VariZIG

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for Postexposure Prophylaxis of Varicella." The FDA approval, given in May 2011, permits patients to receive VariZIG varicella zoster immune globulin up to 10 days after exposure to varicella; previously, VariZIG could be administered up to 96 hours (4 days) after exposure. As before, VariZIG should still be administered as soon as possible after exposure to the disease.

To read the *MMWR* article, go to www.cdc.gov/mmwr/preview/mmwrhtml/mm6112a4.htm.

Vaccine shortages

On April 25, CDC updated its Current Vaccine Shortages & Delays web section with the following information: "Availability of Sanofi Pasteur's Pentacel and Daptacel vaccines is currently reduced and it is anticipated that this will continue throughout the summer of 2012. Sanofi Pasteur's single antigen inactivated polio and Hib vaccines are in sufficient supply to address historic usage of Pentacel as well as the single antigen vaccines. Regarding DTaP, production and supply of GSK's single antigen and combination vaccines is currently sufficient to address anticipated supply gaps for DTaP-containing products." For continuing vaccine supply information, see www.cdc.gov/vaccines/vac-gen/shortages.

Looking for the box of VISs & dates?

It's on page 15 with hyperlinked text that will take you directly to the VIS you want.

Dr. William L. Atkinson, Immunization Legend, Retiring . . . continued from page 1

vaccine rather than one. Since then, Bill has made major contributions to numerous ACIP recommendations. In 1998, he assumed the lead in writing ACIP's *General Recommendations on Immunization*, a critically important reference and teaching guide on immunization techniques and concepts. Bill continued to be an author on subsequent editions, including the 2011 version. Over the past 15 years, Bill has served as a member of almost every ACIP work group, providing useful input based on his extensive interaction with front-line clinicians. Bill has been a trailblazer throughout his career:

- In 1995, he pioneered the use of satellite and broadcast technology to bring immunization education to thousands of immunization providers simultaneously. Since 1995, he produced, wrote, and/or appeared in more than 100 broadcasts and webcasts that were viewed by more than 300,000 healthcare providers.
- In 1995, Bill conceived, developed, and took the lead in writing one of CDC's most widely sought-after books, *Epidemiology and Prevention of Vaccine-Preventable Diseases* (aka the Pink Book). The book is now in its twelfth edition, and more than 400,000 copies have been distributed.
- In 1995, Bill developed nipinfo@cdc.gov, one of

the first and most long-lived program-specific email services at CDC. NIPINFO, which provides access to CDC immunization experts, is run by Bill and other staff of CDC's Immunization Services Division. Since 1995, NIPINFO has responded to between 5,000 and 10,000 queries per year.

Bill's talent as a speaker is legendary within the immunization community. He is in constant demand for live presentations. During his tenure at CDC, he gave more than 600 invited lectures and taught more than 100 two-day training courses across the United States, addressing more than 150,000 attendees.

The recipient of numerous awards, Bill was the first recipient of CDC's highest immunization honor, the Phil Horne Award, which is given to recognize NCIRD staff members who have demonstrated high ideals, innovation, and commitment to immunization practices, and whose accomplishments and work performance have had a significant impact on achieving NCIRD's mission. He was also the 2001 recipient of the Bill Watson Medal of Excellence, the highest award given to a CDC employee.

Throughout his career, Bill has used his creativity, dynamic personality, and exceptional teaching abilities to the benefit of the immunization com-

munity. His numerous accomplishments serve as an inspiration to all of us.

Deborah L. Wexler, MD, executive director of the Immunization Action Coalition (IAC), recalled the first time she heard Bill speak at an immunization conference. "He was breathtaking. His style was completely engaging, entertaining, and energizing. His content was factual and practical. I'd never heard anyone give a presentation about immunization as dynamically as Bill did. Nor had I ever met anyone with the depth and breadth of knowledge about immunization that Bill had.

"Bill's contributions to IAC have been immeasurable. From writing his first "Ask the Experts" column for IAC in 1995 to reviewing IAC's educational materials, he has been an enormously valued partner to IAC for nearly 20 years. He was IAC's CDC project officer from 2000 to 2004, a time of critical expansion for IAC. Since then, he has consistently helped to clarify and sharpen our work. As IAC's founder, I am so appreciative of all that Bill has contributed."

All of us at IAC are grateful to Dr. Atkinson for his enduring leadership and dedication. We wish him great happiness in retirement and hope the immunization community can continue to engage his boundless talents!

Ask the Experts . . . continued from page 1

protection and is considered valid for use in people in this age group.

Is there an upper age limit for Tdap administration? For example, should I vaccinate an 85-year-old?

There is no upper age limit for Tdap vaccination. A one-time dose of Tdap is recommended for all adults.

If HPV vaccine is given subcutaneously (SC) instead of intramuscularly (IM), 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, CDC and the manufacturers recommend that a dose of HPV vaccine given by any route other than intramuscular be repeated. There is no minimum interval between the invalid (subcutaneous) dose and the repeat dose.

Editor's note: The question above is identical to a question that appeared in "Ask the Experts" in the February 2012 issue of Needle Tips. The answer, however, is different. The answer given in February generated significant discussion, which led CDC experts to modify the answer.

Which children should receive PPSV vaccine (in addition to PCV13)? At what age should they receive it? What about older high-risk children who never received PCV13—should they get it now?

PPSV is recommended for children with an immunocompromising condition, or functional or anatomic asplenia, and also for immunocompetent children with chronic heart disease, chronic lung disease, diabetes mellitus, cerebrospinal fluid leak, or cochlear implant. Administer 1 dose of PPSV to children age 2 years and older; administer it at least 8 weeks after the child has received the final dose of PCV. Children with an immunocompromising condition, or functional or anatomic asplenia should receive a second dose of PPSV 5 years after the first PPSV. Older high-risk children who have not yet received a dose of PCV should receive it now. To view a table describing

these recommendations in more detail, see IAC's provider-education piece titled "Recommendations for Pneumococcal Vaccine Use in Children," at www.immunize.org/catg.d/p2016.pdf.

Which adults need to receive PPSV prior to age 65 years?

PPSV is recommended for adults age 19 through 64 years who currently smoke cigarettes; reside in nursing homes or long-term care facilities; have chronic lung disease (including chronic obstructive pulmonary disease, emphysema, and asthma); chronic cardiovascular diseases; diabetes mellitus; chronic liver disease (including cirrhosis); alcoholism; cochlear implants; cerebrospinal fluid leaks; immunocompromising conditions; and functional or anatomic asplenia (e.g., sickle cell disease and other hemoglobinopathies, congenital or acquired asplenia, splenic dysfunction, or splenectomy [if elective splenectomy is planned, vaccinate at least 2 weeks before surgery]); asymptomatic or symptomatic HIV (vaccinate as soon as possible after diagnosis). Public health authorities may consider recommending PPSV for American Indians/

(continued on page 18)

Needle Tips correction policy

If you find an error, please notify us immediately by sending an email message to admin@immunize.org. We publish notification of significant errors in our email announcement service, *IAC Express*. Be sure you're signed up for this service. To subscribe, visit www.immunize.org/subscribe.

Looking for more "Ask the Experts" Q&As?

To find more than
1,000 Q&As answered by
CDC experts, go to

www.immunize.org/askexperts

Figure 1. Recommended Immunization Schedule for Persons Ages 0 through 6 Years, U.S., 2012

For those who fall behind or start late, see the catch-up schedule (Figure 3).

Vaccine ▼ Age ►	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos	18 mos	19–23 mos	2–3 yrs	4–6 yrs
Hepatitis B ¹	HepB	HepB			HepB							
Rotavirus ²			RV	RV	RV ²							
Diphtheria, tetanus, pertussis ³			DTaP	DTaP	DTaP	See footnote 3		DTaP				DTaP
<i>Haemophilus influenzae</i> type b ⁴			Hib	Hib	Hib ⁴		Hib					
Pneumococcal ⁵			PCV	PCV	PCV		PCV				PPSV	
Inactivated poliovirus ⁶			IPV	IPV	IPV		IPV					IPV
Influenza ⁷							Influenza (Yearly)					
Measles, mumps, rubella ⁸							MMR		See footnote 8			MMR
Varicella ⁹							VAR		See footnote 9			VAR
Hepatitis A ¹⁰							Dose 1 ¹⁰				HepA series	
Meningococcal ¹¹							MCV4 — see footnote 11					

Range of recommended ages for all children

Range of recommended ages for certain high-risk groups

Range of recommended ages for all children and certain high-risk groups

This schedule includes recommendations in effect as of December 23, 2011. Any dose not given at the recommended age should be given 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/pubs/acip-list.htm. 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).

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

At birth:

- Give monovalent HepB vaccine to all newborns before hospital discharge.
- For infants born to hepatitis B surface antigen (HBsAg)-positive mothers, give newborn 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 at least 3 doses of the HepB series, at age 9 through 18 months (generally at the next well-child visit).
- If mother's HBsAg status is unknown, within 12 hours of birth give HepB vaccine for infants weighing $\geq 2,000$ grams, and HepB vaccine plus HBIG for infants weighing $< 2,000$ grams. Determine mother's HBsAg status as soon as possible and, if she is HBsAg-positive, give newborn HBIG for infants weighing $\geq 2,000$ grams (no later than age 1 week).

Doses after the birth dose:

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

2. Rotavirus (RV) vaccines. (Minimum age: 6 weeks for both RV-1 [Rotarix] and RV-5 [Rota Teq])

- The maximum age for the first dose in the series is 14 weeks, 6 days; and 8 months, 0 days for the final dose in the series. Vaccination should not be initiated for infants age 15 weeks, 0 days or older.
- If RV-1 (Rotarix) is given at ages 2 and 4 months, a dose at 6 months is not indicated.

3. Diphtheria and tetanus toxoids and acellular pertussis (DTaP) vaccine. (Min. age: 6 weeks)

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

4. *Haemophilus influenzae* type b (Hib) conjugate vaccine. (Minimum age: 6 weeks)

- If PRP-OMP (PedvaxHIB or Comvax [HepB-Hib]) is given at ages 2 and 4 months, a dose at age 6 months is not indicated.
- Hiberix should only be used for the booster (final) dose in children ages 12 months through 4 years.

5. Pneumococcal vaccines. (Minimum age: 6 weeks for pneumococcal conjugate vaccine [PCV]; 2 years for pneumococcal polysaccharide vaccine [PPSV])

- Give 1 dose of PCV to all healthy children ages 24 through 59 months who are not completely vaccinated for their age.
- For children who have received an age-appropriate series of 7-valent PCV (PCV7), a single supplemental dose of 13-valent PCV (PCV13) is recommended for 1) all children ages 14 through 59 months, and 2) children ages 60 through 71 months with underlying medical conditions.
- Give PPSV at least 8 weeks after last dose of PCV to children age 2 years or older with certain underlying medical conditions, including a cochlear implant. See *MMWR* 2010;59(No. RR-11), available at www.cdc.gov/mmwr/pdf/rr/rr5911.pdf.

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

- If 4 or more doses are given before age 4 years, an additional dose should be given at age 4 through 6 years.

- The final dose in the series should be given on or after the fourth birthday and at least 6 months after the previous dose.

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

- For most healthy children age 2 years and older, either LAIV or TIV may be used. However, LAIV should not be given to some children, including 1) children with asthma, 2) children 2 through 4 years who had wheezing in the past 12 months, or 3) children who have any other underlying medical conditions that predispose them to influenza complications. For all other contraindications to use of LAIV, see *MMWR* 2010;59(No. RR-8), available at www.cdc.gov/mmwr/pdf/rr/rr5908.pdf.
- For children ages 6 months through 8 years: 1) for the 2011–12 season, give 2 doses (separated by at least 4 weeks) to those who did not receive at least 1 dose of the 2010–11 vaccine; those who received at least 1 dose of the 2010–11 vaccine require 1 dose for the 2011–12 season and 2) for the 2012–13 season, follow dosing guidelines in the 2012 ACIP influenza vaccine recommendations.

8. Measles, mumps, and rubella (MMR) vaccine. (Minimum age: 12 months)

- The second dose may be given before age 4 years, provided at least 4 weeks have elapsed since the first dose.
- Give MMR vaccine to infants ages 6 through 11 months who are traveling internationally. These children should be revaccinated with 2 doses of MMR vaccine, the first at ages 12 through 15 months and at least 4 weeks after the previous dose, and the second at ages 4 through 6 years.

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

- The second dose may be given before age 4 years, provided at least 3 months have elapsed since the first dose.
- For children ages 12 months through 12 years, the recommended minimum interval between doses is 3 months. However, if the second dose was given at least 4 weeks after the first dose, it can be accepted as valid.

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

- Give the second (final) dose 6 to 18 months after the first.
- Unvaccinated children 24 months and older at high risk should be vaccinated. See *MMWR* 2006;55(No. RR-7), available at www.cdc.gov/mmwr/pdf/rr/rr5507.pdf.
- A 2-dose HepA vaccine series is recommended for anyone age 24 months and older, previously unvaccinated, for whom immunity against hepatitis A virus infection is desired.

11. Meningococcal conjugate vaccines, quadrivalent (MCV4). (Minimum age: 9 months for Menactra [MCV4-D]; 2 years for Menveo [MCV4-CRM])

- For children ages 9 through 23 months 1) with persistent complement component deficiency; 2) who are residents of or travelers to countries with hyperendemic or epidemic disease; or 3) who are present during outbreaks caused by a vaccine serogroup, give 2 primary doses of MCV4, ideally at ages 9 and 12 months or at least 8 weeks apart.
- For children age 24 months and older with 1) persistent complement component deficiency who have not been previously vaccinated; or 2) anatomic/functional asplenia, give 2 primary doses of either MCV4 at least 8 weeks apart.
- For children with anatomic/functional asplenia, if MCV4-D (Menactra) is used, give at a minimum age of 2 years and at least 4 weeks after completion of all PCV doses.
- See *MMWR* 2011;60:72–6, available at www.cdc.gov/mmwr/pdf/wk/mm6003.pdf, and Vaccines for Children Program resolution No. 6/11-1, available at www.cdc.gov/vaccines/programs/vfc/downloads/resolutions/06-11mening-mcv.pdf, and *MMWR* 2011;60:1391–2, available at www.cdc.gov/mmwr/pdf/wk/mm6040.pdf, for further guidance, including revaccination guidelines.

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

Figure 2. Recommended Immunization Schedule for Persons Ages 7 through 18 Years, U.S., 2012

For those who fall behind or start late, see the schedule below and the catch-up schedule (Figure 3).

Vaccine ▼	Age ►	7–10 yrs	11–12 yrs	13–18 yrs
Tetanus, diphtheria, pertussis ¹		1 dose (if indicated)	1 dose	1 dose (if indicated)
Human papillomavirus ²		See footnote 2	3 doses	Complete 3-dose series
Meningococcal ³		See footnote 3	Dose 1	Booster at 16 yrs
Influenza ⁴		Influenza (yearly)		
Pneumococcal ⁵		See footnote 5		
Hepatitis A ⁶		Complete 2-dose series		
Hepatitis B ⁷		Complete 3-dose series		
Inactivated poliovirus ⁸		Complete 3-dose series		
Measles, mumps, rubella ⁹		Complete 2-dose series		
Varicella ¹⁰		Complete 2-dose series		

Range of recommended ages for all children

Range of recommended ages for catch-up immunization

Range of recommended ages for certain high-risk groups

This schedule includes recommendations in effect as of December 23, 2011. Any dose not given at the recommended age should be given 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/pubs/acip-list.htm. 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).

1. Tetanus and diphtheria toxoids and acellular pertussis (Tdap) vaccine. (Minimum age: 10 years for Boostrix and 11 years for Adacel)

- Persons ages 11 through 18 years who have not received Tdap vaccine should receive a dose followed by tetanus and diphtheria toxoids (Td) booster doses every 10 years thereafter.
- Tdap vaccine should be substituted for a single dose of Td in the catch-up series for children ages 7 through 10 years. Refer to the catch-up schedule if additional doses of tetanus and diphtheria toxoid-containing vaccine are needed.
- Tdap vaccine can be given regardless of the interval since the last tetanus and diphtheria toxoid-containing vaccine.

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

- Either HPV4 or HPV2 is recommended in a 3-dose series for females age 11 or 12 years. HPV4 is recommended in a 3-dose series for males age 11 or 12 years.
- The vaccine series can be started beginning at age 9 years.
- Give the second dose 1 to 2 months after the first dose and the third dose 6 months after the first dose (at least 24 weeks after the first dose).
- See *MMWR* 2010;59:626–32, available at www.cdc.gov/mmwr/pdf/wk/mm5920.pdf.

3. Meningococcal conjugate vaccines, quadrivalent (MCV4).

- Give MCV4 at age 11 through 12 years with a booster dose at age 16 years.
- Give MCV4 at age 13 through 18 years if patient is not previously vaccinated.
- If the first dose is given at age 13 through 15 years, a booster dose should be given at age 16 through 18 years with a minimum interval of at least 8 weeks after the preceding dose.
- If the first dose is given at age 16 years or older, a booster dose is not needed.
- Give 2 primary doses at least 8 weeks apart to previously unvaccinated persons with persistent complement component deficiency or anatomic/functional asplenia, and 1 dose every 5 years thereafter.
- Adolescents ages 11 through 18 years with human immunodeficiency virus (HIV) infection should receive a 2-dose primary series of MCV4, at least 8 weeks apart.
- See *MMWR* 2011;60:72–76, available at www.cdc.gov/mmwr/pdf/wk/mm6003.pdf, and Vaccines for Children Program resolution No. 6/11-1, available at www.cdc.gov/vaccines/programs/vfc/downloads/resolutions/06-11mening-mcv.pdf, for further guidelines.

4. Influenza vaccines (trivalent inactivated influenza vaccine [TIV] and live, attenuated influenza vaccine [LAIV]).

- For most healthy, nonpregnant persons, either LAIV or TIV may be used, except LAIV should not be used for some persons, including those with asthma or any underlying medical conditions that predispose them to influenza complications. For all other contraindications to use of LAIV, see *MMWR* 2010;59(No. RR-8), available at www.cdc.gov/mmwr/pdf/rr/mm5908.pdf.
- Give 1 dose to persons age 9 years and older.
- For children ages 6 months through 8 years: 1) for the 2011–12 season, give 2 doses (separated by at least 4 weeks) to those who did not receive at least 1 dose of the 2010–11

vaccine (those who received at least 1 dose of the 2010–11 vaccine require 1 dose for the 2011–12 season) and 2) for the 2012–13 season, follow dosing guidelines in the 2012 ACIP influenza vaccine recommendations.

5. Pneumococcal vaccines (pneumococcal conjugate vaccine [PCV] and pneumococcal polysaccharide vaccine [PPSV]).

- A single dose of PCV may be given to children ages 6 through 18 years who have anatomic/functional asplenia, HIV infection or other immunocompromising condition, cochlear implant, or cerebral spinal fluid leak. See *MMWR* 2010;59(No. RR-11), available at www.cdc.gov/mmwr/pdf/rr/mm5911.pdf.
- Give PPSV at least 8 weeks after the last dose of PCV to children age 2 years or older with certain underlying medical conditions, including a cochlear implant. A single revaccination should be given after 5 years to children with anatomic/functional asplenia or an immunocompromising condition.

6. Hepatitis A (HepA) vaccine.

- HepA vaccine is recommended for children older than age 23 months who live in areas where vaccination programs target older children, who are at increased risk for infection, or for whom immunity against hepatitis A virus infection is desired. See *MMWR* 2006;55(No. RR-7), available at www.cdc.gov/mmwr/pdf/rr/mm5507.pdf.
- Give 2 doses at least 6 months apart to unvaccinated persons.

7. Hepatitis B (HepB) vaccine.

- Give the 3-dose series to those not previously vaccinated.
- For those with incomplete vaccination, follow the catch-up recommendations (Figure 3).
- A 2-dose series (doses separated by at least 4 months) of adult formulation Recombivax HB is licensed for use in children ages 11 through 15 years.

8. Inactivated poliovirus vaccine (IPV).

- The final dose in the series should be given at least 6 months after the previous dose.
- If both OPV and IPV were given as part of a series, a total of 4 doses should be given, regardless of the child's current age.
- IPV is not routinely recommended for U.S. residents age 18 years or older.

9. Measles, mumps, and rubella (MMR) vaccine.

- The minimum interval between the 2 doses of MMR is 4 weeks.

10. Varicella (VAR) vaccine.

- For persons without evidence of immunity (see *MMWR* 2007;56[No. RR-4], available at www.cdc.gov/mmwr/pdf/rr/mm5604.pdf), give 2 doses if not previously vaccinated or the second dose if only 1 dose has been given.
- For persons ages 7 through 12 years, the recommended minimum interval between doses is 3 months. However, if the second dose was given at least 4 weeks after the first dose, it can be accepted as valid.
- For persons age 13 years and older, the minimum interval between doses is 4 weeks.

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) or by telephone (800-CDC-INFO [800-232-4636]).

Figure 3. Catch-up Immunization Schedule for Persons Ages 4 Months through 18 Years Who Start Late or Who Are More Than 1 Month Behind, U. S., 2012

The figure below provides catch-up schedules and minimum intervals between doses for children whose vaccinations have been delayed. A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Use the section appropriate for the child's age. Always use this table in conjunction with the accompanying childhood and adolescent immunization schedules (Figures 1 and 2) and their respective footnotes.

Catch-up schedule for persons 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	Birth	4 weeks	8 weeks and at least 16 wks after first dose, minimum age to the final dose is 24 wks		
Rotavirus ¹	6 wks	4 weeks	4 weeks ¹		
Diphtheria, tetanus, pertussis ²	6 wks	4 weeks	4 weeks	6 months	6 months ²
<i>Haemophilus influenzae</i> type B ³	6 wks	4 weeks if first dose given before age 12 mos 8 weeks (as final dose) if first dose given at age 12–14 mos No further doses needed if first dose given at age 15 mos or older	4 weeks ³ if current age is younger than age 12 mos 8 weeks (as final dose) ³ if current age is 12 mos or older and first dose given before age 12 mos and second dose given before age 15 mos No further doses needed if previous dose given at age 15 mos or older	8 weeks (as final dose) This dose only necessary for children ages 12 mos through 59 mos who received 3 doses before age 12 mos	
Pneumococcal ⁴	6 wks	4 weeks if first dose given before age 12 mos 8 weeks (as final dose for healthy children) if first dose given at age 12 mos or older or current age is 24 through 59 mos No further doses needed for healthy children if first dose given at age 24 mos or older	4 weeks if current age is younger than 12 mos 8 weeks (as final dose for healthy children) if current age is 12 mos or older No further doses needed for healthy children if previous dose given at age 24 mos or older	8 weeks (as final dose) This dose only necessary for children ages 12 mos 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 ⁵	6 wks	4 weeks	4 weeks	6 months ⁵ minimum age 4 yrs for final dose	
Meningococcal ⁶	9 mos	8 weeks ⁶			
Measles, mumps, rubella ⁷	12 mos	4 weeks			
Varicella ⁸	12 mos	3 months			
Hepatitis A	12 mos	6 months			
Catch-up schedule for persons ages 7 through 18 years					
Tetanus, diphtheria/tetanus, diphtheria, pertussis ⁹	7 yrs ⁹	4 weeks	4 weeks if first dose given before age 12 mos 6 months if first dose given at age 12 mos or older	6 months if first dose given before age 12 mos	
Human papillomavirus ¹⁰	9 yrs	Routine dosing intervals are recommended ¹⁰			
Hepatitis A	12 mos	6 months			
Hepatitis B	Birth	4 weeks	8 weeks (and at least 16 wks after first dose)		
Inactivated poliovirus ⁵	6 wks	4 weeks	4 weeks ⁵	6 months ⁵	
Meningococcal ⁶	9 mos	8 weeks ⁶			
Measles, mumps, rubella ⁷	12 mos	4 weeks			
Varicella ⁸	12 mos	3 months if person is younger than age 13 yrs 4 weeks if person is age 13 yrs or older			

1. Rotavirus (RV) vaccines (RV-1 [Rotarix] and RV-5 [Rota Teq]).

- The maximum age for the first dose in the series is 14 weeks, 6 days; and 8 months, 0 days for the final dose in the series. Vaccination should not be initiated for infants age 15 weeks, 0 days or older.
- If RV-1 was given for the first and second doses, a third dose is not indicated.

2. Diphtheria and tetanus toxoids and acellular pertussis (DTaP) vaccine.

- The fifth dose is not necessary if the fourth dose was given at age 4 years or older.

3. *Haemophilus influenzae* type b (Hib) conjugate vaccine.

- Hib vaccine should be considered for unvaccinated persons age 5 years or older who have sickle cell disease, leukemia, or human immunodeficiency virus (HIV) infection, or anatomic/functional asplenia.
- If the first 2 doses were PRP-OMP (PedvaxHIB or Comvax) and were given at age 11 months or younger, the third (and final) dose should be given at age 12 through 15 months and at least 8 weeks after the second dose.
- If the first dose was given at age 7 through 11 months, give the second dose at least 4 weeks later and a final dose at age 12 through 15 months.

4. Pneumococcal vaccine. (Minimum age: 6 weeks for pneumococcal conjugate vaccine [PCV]; 2 years for pneumococcal polysaccharide vaccine [PPSV])

- For children ages 24 through 71 months with underlying medical conditions, give 1 dose of PCV if 3 doses of PCV were received previously, or give 2 doses of PCV at least 8 weeks apart if fewer than 3 doses of PCV were received previously.
- A single dose of PCV may be given to certain children ages 6 through 18 years with underlying medical conditions. See age-specific schedules for details.
- Give PPSV to children age 2 years or older with certain underlying medical conditions. See MMWR 2010;59(No. RR-11), available at www.cdc.gov/mmwr/pdf/rr/rr5911.pdf.

5. Inactivated poliovirus vaccine (IPV).

- A fourth dose is not necessary if the third dose was given at age 4 years or older and at least 6 months after the previous dose.

- 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).

- IPV is not routinely recommended for U.S. residents age 18 years or older.

6. Meningococcal conjugate vaccine, quadrivalent (MCV4). (Minimum age: 9 months for Menactra [MCV4-D]; 2 years for Menveo [MCV4-CRM])

- See Figure 1 ("Recommended immunization schedule for persons ages 0 through 6 years") and Figure 2 ("Recommended immunization schedule for persons ages 7 through 18 years") for further guidance.

7. Measles, mumps, and rubella vaccine (MMR).

- Give the second dose routinely at age 4 through 6 years.

8. Varicella (VAR) vaccine.

- Give the second dose routinely at age 4 through 6 years. If the second dose was given at least 4 weeks after the first dose, it can be accepted as valid.

9. Tetanus and diphtheria toxoids (Td) and tetanus and diphtheria toxoids and acellular pertussis (Tdap) vaccines.

- For children ages 7 through 10 years who are not fully immunized with the childhood DTaP vaccine series, Tdap vaccine should be substituted for a single dose of Td vaccine in the catch-up series; if additional doses are needed, use Td vaccine. For these children, an adolescent Tdap vaccine dose should not be given.
- An inadvertent dose of DTaP vaccine given to children ages 7 through 10 years can count as part of the catch-up series. This dose can count as the adolescent Tdap dose, or the child can later receive a Tdap booster dose at age 11–12 years.

10. Human papillomavirus (HPV) vaccines (HPV4 [Gardasil] and HPV2 [Cervarix]).

- Give the vaccine series to females (either HPV2 or HPV4) and males (HPV4) at age 13 through 18 years if patient is not previously vaccinated.
- Use recommended routine dosing intervals for series catch-up; see Figure 2 ("Recommended immunization schedule for persons ages 7 through 18 years").

Recommended Adult Immunization Schedule – United States, 2012

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

Figure 1. Recommended adult immunization schedule, by vaccine and age group¹





Vaccine ▼	Age group ►	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) ^{5,*}	Females	3 doses					
	Males						
Zoster ⁶						1 dose	
Measles, mumps, rubella (MMR) ^{7,*}		1 or 2 doses				1 dose	
Pneumococcal (polysaccharide) ^{8,9}		1 or 2 doses					1 dose
Meningococcal ^{10,*}		1 or more doses					
Hepatitis A ^{11,*}		2 doses					
Hepatitis B ^{12,*}		3 doses					

*Covered by the Vaccine Injury Compensation Program.

Figure 2. Vaccines that might be indicated for adults, based on medical and other indications¹

Indication ►										
Vaccine ▼	Pregnancy	Immunocompromising conditions (excluding human immunodeficiency virus [HIV]) ^{4,6,7,14}	HIV infection ^{4,7,13,14} CD4+ T lymphocyte count <200 cells/ μL ≥200 cells/ μL	Men who have sex with men (MSM)	Heart disease, chronic lung disease, chronic alcoholism	Asplenia ¹³ (including elective splenectomy and persistent complement component deficiencies)	Chronic liver disease	Diabetes, kidney failure, end-stage renal disease, receipt of hemodialysis	Healthcare personnel	
Influenza ^{2,*}		1 dose TIV annually			1 dose TIV or LAIV annually	1 dose TIV annually			1 dose TIV or LAIV 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,*}		Contraindicated			2 doses					
Human papillomavirus (HPV) ^{5,*}	Females	3 doses through age 26 years				3 doses through age 26 years				
	Males	3 doses through age 26 years				3 doses through age 21 years				
Zoster ⁶		Contraindicated				1 dose				
Measles, mumps, rubella (MMR) ^{7,*}		Contraindicated			1 or 2 doses					
Pneumococcal (polysaccharide) ^{8,9}		1 or 2 doses								
Meningococcal ^{10,*}		1 or more doses								
Hepatitis A ^{11,*}					2 doses					
Hepatitis B ^{12,*}					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
  Tdap recommended for ≥65 if contact with <12 month old child. Either Td or Tdap can be used if no infant contact.
  Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)
  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 January 1, 2012. 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/pubs/acip-list.htm).

The recommendations in this schedule were approved by the Centers for Disease Control and Prevention's (CDC) Advisory Committee on Immunization Practices (ACIP), American Academy of Family Physicians (AAFP), American College of Physicians (ACP), American College of Obstetricians and Gynecologists (ACOG), and American College of Nurse-Midwives (ACNM).

Footnotes

1. Additional Information: Advisory Committee on Immunization Practices (ACIP) vaccine recommendations and additional information are available at www.cdc.gov/vaccines/pubs/acip-list.htm. Information on travel vaccine requirements and recommendations (e.g., for hepatitis A and B, meningococcal, and other vaccines) are available at wwwnc.cdc.gov/travel/page/vaccinations.htm.

2. Influenza vaccination.

- Annual vaccination against influenza is recommended for all persons age 6 months and older.
- Persons age 6 months and older, including pregnant women, can receive the trivalent inactivated vaccine (TIV).
- Healthy, nonpregnant adults younger than age 50 years without high-risk medical conditions can receive either intranasally administered live, attenuated influenza vaccine (LAIV) (FluMist), or TIV. Healthcare personnel who care for severely immunocompromised persons (i.e., those who require care in a protected environment) should receive TIV rather than LAIV. Other persons should receive TIV.
- The intramuscular or intradermal administered TIV are options for adults age 18–64 years.
- Adults age 65 years and older can receive the standard dose TIV or the high-dose TIV (Fluzone High-Dose).

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

- Give a one-time dose of Tdap to adults younger than age 65 years who have not received Tdap previously or for whom vaccine status is unknown to replace one of the 10-year Td boosters.
- Tdap is specifically recommended for the following persons: 1) pregnant women more than 20 weeks' gestation, 2) adults, regardless of age, who are close contacts of infants younger than age 12 months (e.g., parents, grandparents, or child care providers), and 3) healthcare personnel.
- Tdap can be given regardless of interval since the most recent tetanus or diphtheria-containing vaccine.
- Pregnant women not vaccinated during pregnancy should receive Tdap immediately postpartum.
- Adults age 65 years and older who do not have contact with an infant younger than age 12 months may also receive Tdap.
- Adults with unknown or incomplete history of completing a 3-dose primary vaccination series with Td-containing vaccines should begin or complete a primary vaccination series. Tdap should be substituted for a single dose of Td in the vaccination series, with Tdap preferred as the first dose.
- For unvaccinated adults, give the first 2 doses at least 4 weeks apart and the third dose 6–12 months after the second.
- If incompletely vaccinated (i.e., less than 3 doses), give remaining doses.

Refer to the ACIP statement for recommendations for giving 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.
- Special consideration for vaccination should be given to those who 1) have close contact with persons at high risk for severe disease (e.g., healthcare personnel and family contacts of persons with immunocompromising conditions) or 2) 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 given 4–8 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 (although for healthcare personnel and pregnant women, birth before 1980 should not be considered evidence of immunity); 3) history of varicella based on diagnosis or verification of varicella by a healthcare provider (for a patient reporting a history of or having an atypical case, a mild case, or both, healthcare providers should seek either an epidemiologic link to a typical varicella case or to a laboratory-confirmed case or evidence of laboratory confirmation, if it was performed at the time of acute disease); 4) history of herpes zoster based on diagnosis or verification of herpes zoster 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.
- HPV vaccines are not live vaccines and can be given to persons who are immunocompromised as a result of infection (including HIV infection), disease, or medications. Vaccine is recommended for immunocompromised persons through age 26 years who did not get any or all doses when they were younger. The immune response and vaccine efficacy might be less than that in immunocompetent persons.
- Men who have sex with men (MSM) may especially benefit from vaccination to prevent condyloma and anal cancer. HPV4 is recommended for MSM through age 26 years who did not get any or all doses when they were younger.
- Ideally, vaccine should be given before potential exposure to HPV through sexual activity; however, persons who are sexually active should still be vaccinated consistent with age-based recommendations. HPV vaccine can be given to persons with a history of genital warts, abnormal Papanicolaou test, or positive HPV DNA test.
- A complete series for either HPV4 or HPV2 consists of 3 doses. The second dose should be given 1–2 months after the first dose; the third dose should be given 6 months after the first dose (at least 24 weeks after the first dose).
- Although HPV vaccination is not specifically recommended for healthcare personnel (HCP) based on their occupation, HCP should receive the HPV vaccine if they are in the recommended age group.

6. Zoster vaccination.

- A single dose of zoster vaccine is recommended for adults age 60 years and older regardless of whether they report a prior episode of herpes zoster. Although the vaccine is licensed by the Food and Drug Administration (FDA) for use among and can be administered to persons age 50 years and older, ACIP recommends that vaccination begins at age 60 years.
- Persons with chronic medical conditions may be vaccinated unless their condition constitutes a contraindication, such as pregnancy or severe immunodeficiency.
- Although zoster vaccination is not specifically recommended for healthcare personnel (HCP), HCP should receive the vaccine if they are in the recommended age group.

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

- Adults born before 1957 generally are 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, laboratory evidence of immunity to each of the three diseases, or documentation of provider-diagnosed measles or mumps disease. For rubella, documentation of provider-diagnosed disease is not considered acceptable evidence of immunity.
- *Measles component:* A routine second dose of MMR vaccine, given 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 to 1967 should be revaccinated with 2 doses of MMR vaccine.
- *Mumps component:* A routine second dose of MMR vaccine, given 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 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 routinely vaccinating personnel with 2 doses of MMR vaccine at the appropriate interval for measles and mumps or 1 dose of MMR vaccine for rubella.

Footnotes (continued)

8. Pneumococcal polysaccharide (PPSV) vaccination.

- Vaccinate all persons with the following indications:
 - age 65 years and older without a history of PPSV vaccination;
 - adults younger than age 65 years with chronic lung disease (including chronic obstructive pulmonary disease, emphysema, and asthma); chronic cardiovascular diseases; diabetes mellitus; chronic liver disease (including cirrhosis); alcoholism; cochlear implants; cerebrospinal fluid leaks; immunocompromising conditions; and functional or anatomic asplenia (e.g., sickle cell disease and other hemoglobinopathies, congenital or acquired asplenia, splenic dysfunction, or splenectomy [if elective splenectomy is planned, vaccinate at least 2 weeks before surgery]);
 - residents of nursing homes or long-term care facilities; and
 - adults who smoke cigarettes.
- Persons with asymptomatic or symptomatic HIV infection should be vaccinated as soon as possible after their diagnosis.
- When cancer chemotherapy or other immunosuppressive therapy is being considered, the interval between vaccination and initiation of immunosuppressive therapy should be at least 2 weeks. Vaccination during chemotherapy or radiation therapy should be avoided.
- Routine use of PPSV is not recommended for American Indians/Alaska Natives or persons younger than age 65 years unless they have underlying medical conditions that are PPSV indications. However, public health authorities may consider recommending PPSV for American Indians/Alaska Natives who are living in areas where the risk for invasive pneumococcal disease is increased.

9. Revaccination with PPSV.

- One-time revaccination 5 years after the first dose is recommended for persons ages 19 through 64 years with chronic renal failure or nephrotic syndrome; functional or anatomic asplenia (e.g., sickle cell disease or splenectomy); and for persons with immunocompromising conditions.
- Persons who received PPSV before age 65 years for any indication should receive another dose of the vaccine at age 65 years or later if at least 5 years have passed since their previous dose.
- No further doses are needed for persons vaccinated with PPSV at or after age 65 years.

10. Meningococcal vaccination.

- Give 2 doses of meningococcal conjugate vaccine quadrivalent (MCV4) at least 2 months apart to adults with functional asplenia or persistent complement component deficiencies.
- HIV-infected persons who are vaccinated should also receive 2 doses.
- Give a single dose of meningococcal vaccine to microbiologists routinely exposed to isolates of *Neisseria meningitidis*, military recruits, 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.
- MCV4 is preferred for adults with any of the preceding indications who are age 55 years and younger; meningococcal polysaccharide vaccine (MPSV4) is preferred for adults age 56 years and older.
- Revaccination with MCV4 every 5 years is recommended for adults previously vaccinated with MCV4 or MPSV4 who remain at increased risk for infection (e.g., adults with anatomic or functional asplenia, persistent complement component deficiencies).

11. 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 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 of the adoptee 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 given as soon as adoption is planned, ideally 2 or more weeks before the arrival of the adoptee.
- Single-antigen vaccine formulations should be given in a 2-dose schedule at either 0 and 6–12 months (Havrix), or 0 and 6–18 months (Vaqta). 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 schedule may be used, given on days 0, 7, and 21–30, followed by a booster dose at month 12.

12. 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 one 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 exposed to blood or other potentially infectious body fluids;
 - persons with diabetes 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 increased need for assisted blood glucose monitoring in long-term care facilities, likelihood of acquiring hepatitis B infection, its complications, or chronic sequelae, and 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 persons with chronic HBV infection; 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 daycare facilities for persons with developmental disabilities.
- Give 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 given 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, given on days 0, 7, and 21–30, 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 µg/mL (Recombivax HB) given on a 3-dose schedule or 2 doses of 20 µg/mL (Engerix-B) given simultaneously on a 4-dose schedule at 0, 1, 2, and 6 months.

13. Selected conditions for which *Haemophilus influenzae* type b (Hib) vaccine may be used.

- 1 dose of Hib vaccine should be considered for persons who have sickle cell disease, leukemia, or HIV infection, or who have anatomic or functional asplenia if they have not previously received Hib vaccine.

14. Immunocompromising conditions.

- Inactivated vaccines generally are acceptable (e.g., pneumococcal, meningococcal, influenza [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/pubs/acip-list.htm.

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. Information about filing a claim for vaccine injury is available through 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 Precautions¹ to Commonly Used Vaccines* (Page 1 of 2)

Vaccine	Contraindications	Precautions ¹
Hepatitis B (HepB)	<ul style="list-style-type: none"> Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component 	<ul style="list-style-type: none"> 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])	<ul style="list-style-type: none"> Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component Severe combined immunodeficiency (SCID) History of intussusception 	<ul style="list-style-type: none"> Moderate or severe acute illness with or without fever Altered immunocompetence other than SCID Chronic gastrointestinal disease³ Spina bifida or bladder exstrophy³
Diphtheria, tetanus, pertussis (DTaP) Tetanus, diphtheria, pertussis (Tdap)	<ul style="list-style-type: none"> Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component Encephalopathy (e.g., coma, decreased level of consciousness, prolonged seizures) not attributable to another identifiable cause within 7 days of administration of previous dose of DTP or DTaP (for DTaP); or of previous dose of DTP, DTaP, or Tdap (for Tdap) 	<ul style="list-style-type: none"> 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 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 <p>For DTaP only:</p> <ul style="list-style-type: none"> 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
Tetanus, diphtheria (DT, Td)	<ul style="list-style-type: none"> Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component 	<ul style="list-style-type: none"> Moderate or severe acute illness with or without fever 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
Haemophilus influenzae type b (Hib)	<ul style="list-style-type: none"> Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component Age younger than 6 weeks 	<ul style="list-style-type: none"> Moderate or severe acute illness with or without fever
Inactivated poliovirus vaccine (IPV)	<ul style="list-style-type: none"> Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component 	<ul style="list-style-type: none"> Moderate or severe acute illness with or without fever Pregnancy
Pneumococcal (PCV or PPSV)	<ul style="list-style-type: none"> For PCV13, severe allergic reaction (e.g., anaphylaxis) after a previous dose (of PCV7, PCV13, or any diphtheria toxoid-containing vaccine) or to a vaccine component (of PCV7, PCV13, or any diphtheria toxoid-containing vaccine) For PPSV, severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component 	<ul style="list-style-type: none"> Moderate or severe acute illness with or without fever
Measles, mumps, rubella (MMR)⁴	<ul style="list-style-type: none"> 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, receiving chemotherapy, congenital immunodeficiency, or long-term immunosuppressive therapy⁵ or patients with HIV infection who are severely immunocompromised)⁶ Pregnancy 	<ul style="list-style-type: none"> 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 testing⁸

Vaccine	Contraindications	Precautions ¹
Varicella (Var)⁴	<ul style="list-style-type: none"> 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, receiving chemotherapy, congenital immunodeficiency, or long-term immunosuppressive therapy⁵ or patients with HIV infection who are severely immunocompromised)⁶ Pregnancy 	<ul style="list-style-type: none"> 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, if possible; delay resumption of these antiviral drugs for 14 days after vaccination.
Hepatitis A (HepA)	<ul style="list-style-type: none"> Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component 	<ul style="list-style-type: none"> Moderate or severe acute illness with or without fever Pregnancy
Influenza, injectable trivalent (TIV)	<ul style="list-style-type: none"> Severe allergic reaction (e.g., anaphylaxis) after a previous dose of any influenza vaccine or to a vaccine component, including egg protein 	<ul style="list-style-type: none"> Moderate or severe acute illness with or without fever History of GBS within 6 weeks of previous influenza vaccine
Influenza, live attenuated (LAIV)⁴	<ul style="list-style-type: none"> Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component, including egg protein Possible reactive airways disease in a child age 2 through 4 years (e.g., history of recurrent wheezing or a recent wheezing episode) Immune suppression Certain chronic medical conditions such as asthma, diabetes, heart or kidney disease⁹ Pregnancy 	<ul style="list-style-type: none"> Moderate or severe acute illness with or without fever History of GBS within 6 weeks of previous influenza vaccine Receipt of specific antivirals (i.e., amantadine, rimantadine, zanamivir, or oseltamivir) 48 hours before vaccination, if possible; avoid use of these antiviral drugs for 14 days after vaccination.
Human papilloma-virus (HPV)	<ul style="list-style-type: none"> Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component 	<ul style="list-style-type: none"> Moderate or severe acute illness with or without fever Pregnancy
Meningococcal: conjugate (MCV4); polysaccharide (MPSV4)	<ul style="list-style-type: none"> Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component 	<ul style="list-style-type: none"> Moderate or severe acute illness with or without fever
Zoster (Zos)	<ul style="list-style-type: none"> 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, or long-term immunosuppressive therapy⁴ or patients with HIV infection who are severely immunocompromised). Pregnancy 	<ul style="list-style-type: none"> Moderate or severe acute illness with or without fever Receipt of specific antivirals (i.e., acyclovir, famciclovir, or valacyclovir) 24 hours before vaccination, if possible; delay resumption of these antiviral drugs for 14 days after vaccination.

Footnotes

- 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. Whether and when to administer DTaP to children with proven or suspected underlying neurologic disorders should be decided on a case-by-case basis.
- 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.
- 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) at www.cdc.gov/vaccines/pubs/acip-list.htm.
- LAIV, MMR, and varicella vaccines can be administered on the same day. If not adminis-

tered on the same day, these vaccines should be separated by at least 28 days.

- Substantially immunosuppressive steroid dose is considered to be 2 weeks or more of daily receipt of 20 mg (or 2 mg/kg body weight) of prednisone or equivalent.
- HIV-infected children may receive varicella and measles vaccine if CD4+ T-lymphocyte count is >15%. (Source: Adapted from American Academy of Pediatrics. Passive Immunization. In: Pickering LK, ed. *Red Book: 2009 Report of the Committee on Infectious Diseases*. 28th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2009.)
- Vaccine should be deferred for the appropriate interval if replacement immune globulin products are being administered (see Table 5 in CDC. "General Recommendations on Immunization: Recommendations of the Advisory Committee on Immunization Practices (ACIP)" at www.cdc.gov/vaccines/pubs/acip-list.htm.)
- Measles vaccination might suppress tuberculin reactivity temporarily. Measles-containing vaccine can 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.
- For details, see CDC. "Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP), 2010. *MMWR* 2010;59(No. RR-8), available at www.cdc.gov/vaccines/pubs/acip-list.htm.

*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 (www.cdc.gov/vaccines/pubs/pinkbook/index.html).

More information on vaccine components, contraindications, and precautions also is available from specific vaccine package inserts and ACIP recommendations for specific vaccines, and is summarized in Atkinson W, Wolfe S, Hamborsky J, eds. Epidemiology and Prevention of Vaccine-Preventable Diseases. 12th ed. Washington, DC: Public Health Foundations, 2011 (www.cdc.gov/vaccines/pubs/pinkbook/index.html).

Tips for Locating Old Immunization Records

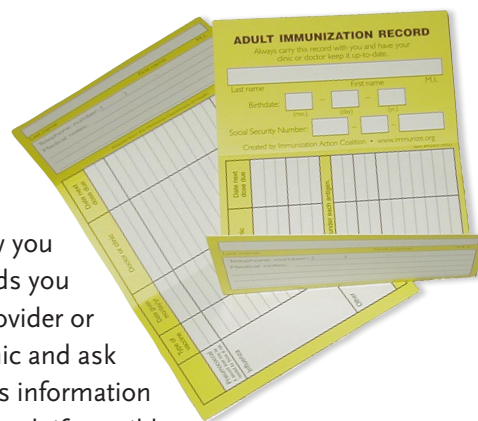
Immunization records often are needed for entry into child-care, kindergarten, school, summer camp, and college or other post-high school training, as well as for future employment and international travel. If you are seeing a new healthcare provider, you will need this information to ensure you receive proper medical care. Providers usually count only those vaccine doses that are documented on a written record or available on a local computerized immunization information system. Unfortunately, no national organization maintains this information. So, if immunization records are lost or not available, you or your child may have to repeat vaccine doses. Piecing together old immunization information can be difficult and time-consuming. Here are some ideas that might help you reconstruct this information.

PLACES YOU MAY WANT TO CHECK:

- **All previous healthcare providers** – Don't forget vaccination visits you made to local public health departments or neighborhood clinics. Sometimes when physicians retire or a medical practice changes hands, old patient records are sent to a medical record storage company. You may be able to obtain records directly from the company, but you may have to pay a fee.
- **Your home** – Look through your old papers, including baby books and school or camp forms. If you're an adult, don't forget to ask your mother or father if they still have your childhood records.
- **Schools and colleges or other post-secondary institutions** you or your child attended.
- **Previous employers**, including the military.
- **Local immunization registry** – Most states and some cities have centralized registries of vaccines given by local providers. Although a registry may not have all records, this still can be a great place to check. The Centers for Disease Control and Prevention (CDC) has a listing of registry contacts and websites at www.cdc.gov/vaccines/programs/iis/contacts-state-iis.htm. Or to find the phone number of your local health department, call 800-CDC-INFO (232-4636).

WHEN YOU FIND YOUR RECORDS

Congratulations! Now you should take the records you have found to your provider or local public health clinic and ask them to document this information on an official record, and, if possible, in the state or local immunization registry. Many schools, camps, etc., will accept only this type of “provider-verified” record because this ensures the information has been evaluated and corroborated by a medical professional. But if you're unable to visit your provider or clinic, your next best option is to consolidate this information on an immunization record card, available through your state health department or at www.immunize.org/recordcards. You should document the name of the vaccine, the date it was given, the name of the provider or clinic that administered it, and any additional information found on the record. Be sure to place all your supporting documentation in a safe place where you can find it.



WHAT IF YOU DON'T FIND YOUR RECORDS?

In general, both children and adults will need to repeat some vaccines. Although this is time-consuming and inconvenient, it is not harmful to receive additional vaccine doses. For a few vaccines, blood tests can help determine if you're already immune to certain diseases. Your healthcare provider can help you determine exactly what's best for you.

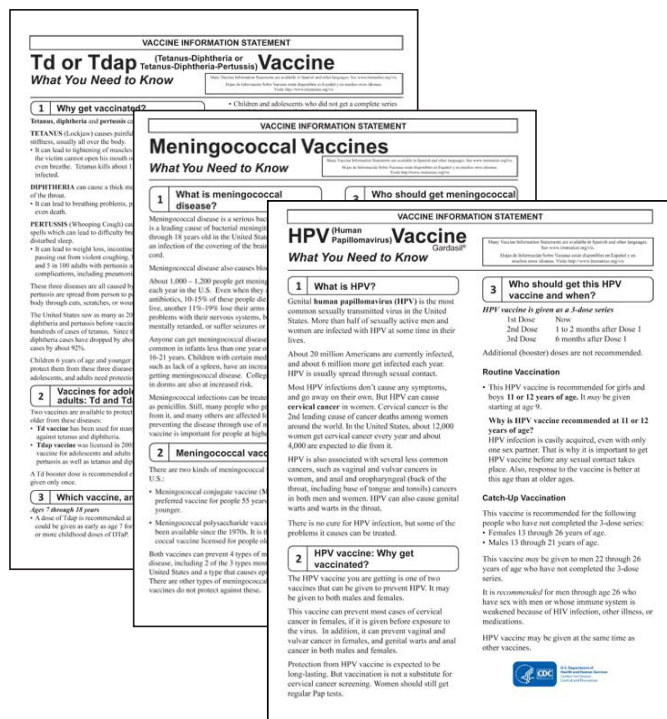
FOR THE FUTURE...

To avoid hunting for old records and possibly repeating undocumented vaccinations, remember to bring your or your child's immunization record card to EVERY medical appointment. Keep your personal record in your wallet, a vinyl sleeve, or a Ziploc bag. It is also a good idea to keep a back-up copy where you store your important papers. Make sure all vaccines you are given are documented on this card or a supplemental record. Ask that your vaccines also be documented in an immunization registry, whenever possible. Remember, you need to rely on YOU to keep these records. This will help you save time, reduce hassles, and be ready to provide your immunization history whenever it's needed in the future!

Technical content reviewed by the Centers for Disease Control and Prevention

Facts about Vaccine Information Statements (VISs)

Clinicians have an obligation to give them to patients



■ Federal law requires that VISs be used when vaccinating patients of ALL ages. They must be given to either (1) the adult to be vaccinated or (2) the parent or legal representative of the child to be vaccinated.

■ VISs are required for use in both public and private sectors, regardless of the source of payment for the vaccine.

■ The VIS must be provided before the vaccine is administered to the patient.

■ You must provide a current VIS for all vaccine doses in a series (not just the first dose).

■ When giving a combination vaccine, you must provide a separate VIS for each component in the vaccine (e.g., DTaP, Polio). Alternatively, you may use the "Multi-vaccine VIS" for any combination of DTaP, IPV, HepB, Rota, PCV, and/or Hib.

■ VISs should not be altered before giving them to patients. Clinicians may, however, add their practice's name, address, or phone number to the VIS.

■ You must provide VISs to all patients, including patients who may not read or speak English. Translations of VISs in more than 30 languages are available from IAC at www.immunize.org/vis.

The use of almost all VISs is mandated by federal law. Make certain you have the most up-to-date versions of all VISs by checking the dates on your existing stock of VISs against the dates below. To download a print-ready version in English, simply click on the text.

DTaP/DT/DTP.....	5/17/07	MMRV.....	5/21/10
Hepatitis A	10/25/11	PCV	4/16/10
Hepatitis B	2/2/12	*PPSV	10/6/09
Hib	12/16/98	Polio	11/8/11
HPV (Cervarix)	5/3/11	Rabies	10/6/09
HPV (Gardasil)	2/22/12	Rotavirus	12/6/10
Influenza (LAIV)	7/26/11	*Shingles	10/6/09
Influenza (TIV)	7/26/11	Td/Tdap	1/24/12
*Japan. enceph.....	12/7/11	*Typhoid.....	5/19/04
Meningococcal.....	10/14/11	Varicella	3/13/08
MMR.....	4/20/12	*Yellow fever	3/30/11
Multi-vaccine VIS (for 6 vaccines given to infants/children: DTaP, IPV, Hib, HepB, PCV, RV).....			
9/18/08			

*Though use of these four VISs is not federally mandated, CDC recommends that VISs be used *every time* vaccine is administered.

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Alaska Natives who live in areas where the risk for invasive pneumococcal disease is increased. Please see IAC's "Pneumococcal Polysaccharide Vaccine: CDC answers your questions" at www.immunize.org/catg.d/p2015.pdf.

Editor's note: The next Q&A explains which adults need a second dose of PPSV.

Which adults should receive a second dose of PPSV?

One-time revaccination 5 years after the first dose is recommended for people age 19 through 64 years who have functional or anatomic asplenia (including persons with sickle cell disease or splenectomy patients); chronic renal failure (including dialysis patients) or nephrotic syndrome; are immunocompromised, including those with HIV infection, leukemia, lymphoma, Hodgkin's disease, multiple myeloma, generalized malignancy; are receiving immunosuppressive therapy (including long-term systemic corticosteroids or radiation therapy); or who have received an organ or bone marrow transplant.

Adults who receive their first PPSV at or after age 65 years should receive only a single dose, regardless of their health status. Please see IAC's "Pneumococcal Polysaccharide Vaccine: CDC answers your questions" at www.immunize.org/catg.d/p2015.pdf.

PCV13 is now licensed for use in adults, but I don't see anything about it in the 2012 adult immunization schedule. How should it be used?

FDA licensed PCV13 (Prenar13; Pfizer) for adults age 50 years and older in December 2011. At its February 2012 meeting, ACIP reviewed the evidence for the use of PCV13 in adults but did not vote on recommendations for its use in adults. As always, physicians can use their clinical judgment and use FDA-licensed vaccines if they would like to do so.

What are the minimum intervals for giving the 3-dose series of Twinrix (hepatitis A-hepatitis B vaccine; GSK)?

Minimum intervals for Twinrix are 4 weeks between dose #1 and dose #2, and 5 months between dose #2 and dose #3.

When reconstituting a vaccine with the manufacturer-supplied diluent, should the clinic nurse administer exactly 0.5 mL and then discard the rest?

No. The nurse should administer the entire volume supplied. The package inserts include this information.

Should we fill out a report with the Vaccine Adverse Event Reporting System (VAERS) if a patient faints after getting a vaccination, even if no injury or complication resulted?

Yes. VAERS looks for trends, so such information is helpful. To find out about VAERS and the kinds of events you should report to the system, visit vaers.hhs.gov/index.

If a new version of a VIS becomes available, is it legal for us to use up the outdated VISs or do we have to discard them and provide the most up-to-date version?

When a new or updated VIS is released, CDC posts information on its website that indicates if healthcare providers can use up their stock of the old version of the VIS or should discard the old version and begin using the new VIS right away. The answer generally depends on how significantly the VIS was changed. You can tell what has been changed recently by going to the CDC website at www.cdc.gov/vaccines/pubs/vis/vis-news.htm.

To determine whether you need to use the new one versus the old, you can have CDC email you an update by subscribing to CDC's free email subscription service at www.cdc.gov/emailupdates. After you've signed up, you'll be taken to a page with lots of options. Once there, check the Vaccine Information Statements box under the section titled "Vaccines & Immunizations."

A 10-year-old girl came to our immunization clinic, and the nurse noted crusted lesions on her arms and legs. The parent said the child had had chickenpox a week earlier. The girl was not ill, so we vaccinated her. But now I am wondering if her recent case of chickenpox might interfere with her immune response to vaccines.

Do not be concerned that the girl's recent case of chickenpox will interfere with her immune response. Previous history of chickenpox disease, even recent disease, will not interfere with the im-

mune response to different vaccines. To review the true contraindications and precautions to vaccination, consult IAC's "Guide to Contraindications and Precautions to Commonly Used Vaccines" at www.immunize.org/catg.d/p3072a.pdf. Another helpful resource is ACIP's *General Recommendations on Immunization*. It contains a useful table titled "Conditions commonly misperceived as contraindications to vaccination." The table is available at www.cdc.gov/vaccines/recs/vac-admin/contraindications-misconceptions.htm.

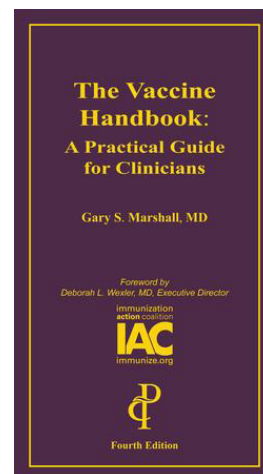
A child wiggled when we were injecting a dose of vaccine, and approximately half the dose was lost. Should we revaccinate the child? If so, when?

When injectable vaccine volume is lost (patient moves, syringe leaks), it may be difficult to judge how much vaccine the patient actually received. In general, you should treat this as a nonstandard injectable dose and should not count it. If it was an inactivated vaccine, you should re-immunize the person as soon as possible. If it was a live vaccine, you can give another dose if you detect the error on the same clinic day; otherwise you should wait 28 days to give the next dose. However, if part of a dose of an oral vaccine (rotavirus) was spit out, count the dose and do not administer a second dose.

Should a healthcare worker who has just received a dose of a live virus vaccine (varicella, MMR, LAIV, yellow fever) stay away from work for a certain number of days?

No. Healthcare workers should not refrain from working after receiving live virus vaccines or any other vaccine.

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