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NEEDLE TIPS

from the Immunization Action Coalition — www.immunize.org

What's In This Issue

Leading Medical and Public Health Organizations Join Efforts Urging Physicians to Strongly Recommend HPV Vaccination

Four leading national medical associations—the American Academy of Family Physicians (AAFP), the American Academy of Pediatrics (AAP), the American College of Physicians (ACP), and the American College of Obstetricians and Gynecologists (ACOG)—together with the Immunization Action Coalition (IAC) and the Centers for Disease Control and Prevention (CDC), have issued a call to action, urging physicians across the United States to educate their patients about human papillomavirus (HPV) vaccine, and to strongly recommend HPV vaccination.

In their "Dear Colleague" letter, these medical and public health organizations emphasize to physicians that a strong healthcare provider recommendation is critical to increasing the rate of HPV vaccination and preventing HPV-associated cancers. Despite more than seven years of vaccine monitoring showing overwhelming evidence of HPV vaccine safety and effectiveness, HPV vaccination rates are not improving while rates for other adolescent vaccines are.

In the United States alone, 79 million people are currently infected with HPV. Every year, 14 million are newly infected and 26,000 cancers attributable to HPV are diagnosed. Studies show that when a provider strongly recommends HPV vaccination, patients are 4 to 5 times more likely to receive HPV vaccine. It is time for physicians to strongly recommend HPV vaccine to prevent cervical and other cancers.

"What you say matters, and how you say it matters even more," says IAC Executive Director Deborah Wexler, MD. "A lukewarm recommendation may lead people to perceive HPV vaccination as less important than other vaccines."

AAFP President Reid Blackwelder, MD, states, "It's astonishing that despite a remarkable effectiveness record, only around a third of U.S. adolescent girls complete HPV vaccination. Countries like Rwanda are immunizing more than four out of five adolescent girls. We've got to do better in the United States."

"The AAP recognizes that parents have many questions about the HPV vaccine," said AAP President James M. Perrin, MD, FAAP. "It's important for providers to be able to engage in dialogue, answer questions, and still provide a strong recommendation for the vaccine. Even with parents who have questions, a healthcare

Recommend HPV Vaccine. . . *continued on p. 5* ▶

Ask the Experts

IAC extends thanks to our experts, medical officer Andrew T. Kroger, MD, MPH; nurse educator Donna L. Weaver, RN, MN; and medical officer Iyabode Akinsanya-Beysolow, 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)

HPV vaccine

I read that HPV vaccination rates are still low. What can we do as providers to improve these rates?

Results from the Centers for Disease Control and Prevention's 2012 National Immunization Survey-Teen (NIS-Teen) indicate that HPV vaccination rates in girls age 13 through 17 years failed to increase between 2011 and 2012, and the 3-dose coverage rate actually declined slightly during this period. Just over half of the girls age 13 through 17 years had started the series that they should have completed by age 13 years. Only about one-third of girls this age had completed the series. In 2012, the first year HPV vaccine was routinely recommended for boys, 20.8% of boys age 13 through 17 years had received one dose and only 6.8% had received all three recommended doses. A summary of the 2012 NIS-Teen survey is available at www.cdc.gov/mmwr/pdf/wk/mm6234.pdf, page 685.

Providers can improve uptake of this life-saving vaccine in two main ways. First, studies have shown that missed opportunities are a big problem. Eighty-four percent of girls unvaccinated for HPV had a healthcare visit where they received another vaccine such as Tdap, but not HPV. If HPV vaccine had been administered at the same visit, vaccination coverage for one or more doses could be nearly 93% instead of 54%.

Second, the 2012 NIS-Teen data show that not receiving a healthcare provider's recommendation for HPV vaccine was one of the five main reasons

Ask the Experts . . . *continued on p. 22* ▶

Needle Tips

online at www.immunize.org/nt

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HPV Vaccination Resources for Providers and Patients at Your Fingertips

To help you carry out the important mission of improving human papillomavirus (HPV) vaccination uptake, IAC has compiled an extensive listing of online educational information and print resources about HPV from the following organizations: the Immunization Action Coalition (IAC), the Centers for Disease Control and Prevention (CDC), the American Academy of Family Physicians (AAFP), the American Academy of Pediatrics (AAP), the American College of Obstetricians and Gynecologists (ACOG), the Vaccine Education Center at the Children's Hospital of Philadelphia (VEC), and others.

Print and online resources for providers

- *Dear Colleague* letter titled "Give a strong recommendation for HPV vaccine to increase uptake!" at www.immunize.org/letter/recommend_hpv_vaccination.pdf (IAC).
- "Tips and Time-savers for Talking with Parents about HPV Vaccine" at www.cdc.gov/vaccines/who/teens/for-hcp-tipsheet-hpv.html (CDC).
- *You Are the Key to HPV Cancer Prevention* campaign web section at www.cdc.gov/vaccines/who/teens/for-hcp/hpv-resources.html (CDC).
- HPV web section at www.immunize.org/hpv (IAC).
- HPV handouts for patients and providers at www.immunize.org/handouts/hpv-vaccines.asp (IAC).
- Ask the Experts: HPV Q&As at www.immunize.org/askexperts/experts_hpv.asp (IAC).
- HPV Vaccine Information Statements in more than 15 languages at www.immunize.org/vis (CDC, IAC).
- "HPV Information for Ob-Gyns" at www.immunizationforwomen.org/immunization_facts/vaccine-preventable_diseases/human_papillomavirus (ACOG).
- "HPV Frequently Asked Questions for Providers" at www.immunizationforwomen.org/faqs/hpv (ACOG).

Print and online resources for patients

- "A Parent's Guide to HPV Vaccination" at www.immunize.org/catg.d/p4250.pdf (IAC).
- HPV Personal Testimonies of suffering at www.vaccineinformation.org/personal-testimonies (IAC).
- HPV Unprotected People Reports at www.immunize.org/reports/hpv.asp (IAC).
- HPV web section for parents and patients at www.vaccineinformation.org/hpv (IAC).
- Immunization Safety Office "Frequently Asked Questions about HPV Vaccine Safety" at www.cdc.gov/vaccinesafety/Vaccines/HPV/hpv_faqs.html (CDC).
- "Why Your Doctor Says You Should Get All 3 HPV Vaccine Shots" at www2.aap.org/immunization/families/APAHPVHandout.pdf (AAP).
- "FAQs for Patients Concerning HPV Vaccination" at www.immunizationforwomen.org/site/assets/docs/Tear pad FAQ HPV 2014 PDF final.pdf (ACOG).
- Prevent HPV web section, includes new brochure for boys and young men, videos, and more at www.chop.edu/service/vaccine-education-center/prevent-hpv/index.html (VEC).

Video: In Memory of Heather Burcham
www.youtube.com/immunizationaction

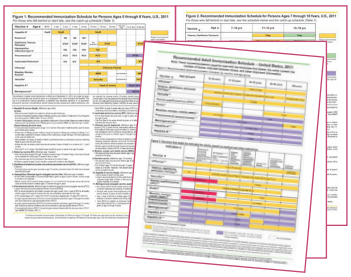
Videos and PSAs

- HPV video collection for healthcare providers at www.immunize.org/votw/hpv-videos.asp (IAC).
- Video Library features a collection of HPV-related videos for parents and the public at www.vaccineinformation.org/videos/index.asp?vid_cat=0012 (IAC).
- Videos, radio PSAs, and podcasts about the importance of HPV vaccination at www.cdc.gov/vaccines/who/teens/products/video-audio.html (CDC).

Reports, commentaries, and news

- Commentary by Dr. Michael T. Brady, "Pediatricians Can Lay Out Evidence to Allay Fears Over HPV Vaccine" at http://aapnews.aappublications.org/content/35/3/9.1.full (*AAP News*).
- Joint press release: "Leading Medical and Public Health Organizations Join Efforts Urging Physicians to Strongly Recommend HPV Vaccination" at www.immunize.org/press/recommend_hpv_vaccination.asp (IAC).
- "Strong Recommendation to Vaccinate Against HPV Is Key to Boosting Uptake" at www.aafp.org/news-now/health-of-the-public/20140212hpv-vaccltr.html (*AAFP News Now).*
- Post by Dr. Nathan Boonstra "HPV Vaccines and Failure to Communicate" at www.voicesforvaccines.org/hpv-vaccines-and-failure-to-communicate (Voices for Vaccines).
- "Accelerating HPV Vaccine Uptake: Urgency for Action to Prevent Cancer" at deainfo.nci.nih.gov/advisory/pcp/annualReports/HPV/PDF/PCP_Annual_Report_2012-2013.pdf (President's Cancer Panel).

2014 Laminated child and adult immunization schedules Order one of each for every exam room



Here are the ACIP/AAP/AAFP-approved immunization schedule for people ages 0 through 18 years (8-sided) and the ACIP/AAFP/ACOG/ACNM-approved schedule for adults (6-sided). Both are laminated and washable for heavy-duty use, complete with essential footnotes, and printed in color for easy reading. The cost is $7.50 for each schedule and only $5.50 each for five or more copies.

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

For 20 or more copies, contact us for discount pricing: admininfo@immunize.org

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

Now you can give any patient a permanent vaccination record card designed specifically for their age group: child & teen, adult, or lifetime. These brightly colored cards are printed on durable rip-, smudge-, and water-proof paper. To view the cards or for more details, go to www.immunize.org/shop and click on the images.

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To receive sample cards, contact us: admininfo@immunize.org

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Please **make a tax-deductible donation today** on our secure website **www.immunize.org/support** or mail a check to the Immunization Action Coalition, 1573 Selby Avenue, Suite 234, St. Paul, MN, 55104, or call us at 651-647-9009.

IAC is a 501(c)(3) nonprofit organization.

Vaccine Highlights

Recommendations, schedules, and more

Editor's note: The information in Vaccine Highlights is current as of March 24, 2014.

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 two meetings will be held on June 25–26 and October 29–30. For more information, visit www.cdc.gov/vaccines/acip/index.html.

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 readily available. Here are sources:

- Download them from links on Immunization Action Coalition (IAC) website: www.immunize.org/acip.
- Download them from CDC's ACIP website: www.cdc.gov/vaccines/hcp/acip-recs.

In addition, extensive information on ACIP meetings is available at www.cdc.gov/vaccines/acip/meetings/meetings-info.html, including details on past and upcoming meetings, meeting dates, registration, draft agendas, minutes, live meeting archives, and presentation slides.

2014 immunization schedules

On February 7, CDC published "ACIP Recommended Immunization Schedules for Persons Aged 0 Through 18 Years" and "ACIP Recommended Immunization Schedule for Adults Aged 19 Years or Older—U.S., 2014." These *MMWR* reports are available at www.cdc.gov/mmwr/preview/mmwrhtml/mm6305a6.htm and www.cdc.gov/mmwr/preview/mmwrhtml/mm6305a7.htm, respectively.

The child and teen immunization schedule is issued jointly by ACIP, AAP, and AAFP, and is available at www.cdc.gov/vaccines/schedules/downloads/child/0-18yrs-child-combined-schedule.pdf.

The adult schedule is issued jointly by ACIP, AAFP, ACOG, ACP, and ACNM, and is available at www.cdc.gov/vaccines/schedules/downloads/adult/adult-combined-schedule.pdf.

The Immunization Action Coalition (IAC) has developed laminated, full-size versions of both the child/teen (8-sided) and the adult (6-sided) immunization schedules. They are available for purchase. For more information, visit www.immunize.org/shop/laminated-schedules.asp.

Vaccine Information Statements

On March 5, CDC temporarily removed the pediatric Multi-vaccine VIS from its website so it could be updated to reflect current ACIP recommendations. The Multi-vaccine VIS contained information about six vaccines administered to children (DTaP, IPV, PCV, HepB, Hib, and RV). According to CDC, a revised Multi-vaccine VIS should be available by mid-2014, and in the meantime, existing supplies of Multi-vaccine VISs should be discarded and individual vaccine VISs should be used instead.

On February 4, CDC released updated VISs for *Haemophilus influenzae* type b (Hib) and Td vaccines. The updated Hib VIS replaces the 1998 version. Access the Hib VIS at www.immunize.org/vis/vis_hib.asp. Access the Td VIS at www.immunize.org/vis/vis_td.asp. Because both VISs contain changes in the adverse events section, it is advisable to begin using the updated Hib and Td VISs immediately.

On January 24, CDC released a revised Japanese encephalitis VIS. The VIS was updated to reflect the change in Ixiaro's minimum age from 17 years to age two months. Access the Japanese encephalitis VIS at www.immunize.org/vis/vis_japanese_encephalitis_ixiaro.asp.

Rotavirus vaccine news

On January 31, CDC published "Notes from the Field: Rotavirus Vaccine Administration Errors—U.S., 2006–2013" in *MMWR*. CDC searched for reports to the Vaccine Adverse Event Reporting System of rotavirus vaccine administration errors involving injection and eye splashes in the United States during the period January 1, 2006–August 1, 2013. A total of 66 reports were found. Access the complete report at www.cdc.gov/mmwr/preview/mmwrhtml/mm6304a4.htm.

Measles news

On March 7, the New York City Department of Health and Mental Hygiene issued a press release identifying 19 cases of measles in northern Manhattan, the Bronx, and Brooklyn, including ten adults and nine infants and children. To date, there have been five hospitalizations as a result of this outbreak. New York State and Connecticut have reported cases of measles in 2014. Access the press release at www.nyc.gov/html/doh/html/pr2014/pr007-14.shtml.

On February 19, 2014, the California Department of Public Health (CDPH) issued a health advisory titled "14 Measles Cases in State of California in 2014." Access the advisory at www.cdph.ca.gov/HealthInfo/discond/Documents/CDPHMeaslesHealthAdvisoryFeb2014.pdf.

New and updated VISs

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

DTaP/DT/DTP	5/17/07	MMRV	5/21/10
Hepatitis A	10/25/11	PCV13	2/27/13
Hepatitis B	2/2/12	PPSV	10/6/09
Hib	2/4/14	Polio	11/8/11
HPV (Cervarix)	5/3/11	Rabies	10/6/09
HPV (Gardasil)	5/17/13	Rotavirus	8/26/13
Influenza (LAIV)	7/26/13	Shingles	10/6/09
Influenza (TIV)	7/26/13	Td	2/4/14
Japan. enceph.	1/24/14	Tdap	5/9/13
Meningococcal	10/14/11	Typhoid	5/29/12
MMR	4/20/12	Varicella	3/13/08
Multi-vaccine VIS	unavailable Expected mid-2014	Yellow fever	3/30/11

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

Hib vaccine news

CDC published *"Prevention and Control of Haemophilus influenzae Type b Disease: Recommendations of the ACIP"* in the February 28 issue of *MMWR Recommendations and Reports*. Access the recommendations at www.cdc.gov/mmwr/pdf/rr/rr6301.pdf.

Hepatitis B vaccine news

On December 20, *MMWR Recommendations and Reports* published *CDC Guidance for Evaluating Health-Care Personnel for Hepatitis B Virus Protection and for Administering Postexposure Management.* This report contains CDC guidance that augments the 2011 ACIP recommendations for evaluating hepatitis B protection among healthcare personnel and administering post-exposure prophylaxis. Explicit guidance is provided for persons working, training, or volunteering in healthcare settings who have documented hepatitis B (HepB) vaccination years before hire or matriculation (e.g., when HepB vaccination was received as part of routine infant [recommended since 1991] or catch-up adolescent [recommended since 1995] vaccination). Access the guidance document at www.cdc.gov/mmwr/pdf/rr/rr6210.pdf.

Influenza news

According to a CDC telebriefing held on February 7, the 2013–14 influenza season has been particularly hard on younger- and middle-age adults, with people age 18–64 years representing 61% of all hospitalizations due to influenza—up from the previous three seasons when this age group represented only about 35% of all such hospitalizations.

On February 21, CDC published three articles in *MMWR* about influenza.

- "Interim Estimates of 2013–14 Seasonal Influenza Vaccine Effectiveness—U.S., Feb. 2014" available at www.cdc.gov/mmwr/preview/mmwrhtml/mm6307a1.htm.
- "Update: Influenza Activity—U.S., Sept. 29, 2013–Feb. 8, 2014" available at www.cdc.gov/mmwr/preview/mmwrhtml/mm6307a3.htm.
- "Influenza-Associated Intensive-Care Unit Admissions and Deaths—California, Sept. 29, 2013–Jan. 18, 2014" available at www.cdc.gov/mmwr/preview/mmwrhtml/mm6307a2.htm.

On February 3, CDC posted a "Dear Colleague" letter authored by Anne Schuchat, MD, director, NCIRD, CDC, as well as eleven professional societies. The letter urges healthcare professionals to protect all pregnant and postpartum women against influenza with vaccination, and also to initiate prompt antiviral treatment for pregnant women with influenza. Access the letter at www.cdc.gov/flu/pdf/protect/pregnancy-letter-2014.pdf.

On December 16, 2013, the New York City Board of Health approved a proposal to require influenza immunization for children in licensed preschool and daycare facilities. The new rule took effect January 16, 2014, but will not be enforced until the end of the year. Children attending a licensed preschool or daycare center in NYC will need to be vaccinated against influenza by December 31, unless exempted for medical or religious reasons. "Frequently Asked Questions for Parents" about these new requirements is available at www.nyc.gov/html/doh/downloads/pdf/imm/day-care-flu-faq.pdf.

Adult immunization news

The March/April 2014 issue of *Public Health Reports* published "Recommendations of the National Vaccine Advisory Committee (NVAC): Standards for Adult Immunization Practice." Access the Standards at www.publichealthreports.org/issueopen.cfm?articleID=3145. The NVAC standards recognize the importance of the healthcare provider recommendation for patients to receive needed vaccines, the current low vaccination rates among U.S. adults, and reflect the changed environment within which adult vaccines are now given.

On February 7, CDC published "Noninfluenza Vaccination Coverage Among Adults—U.S., 2012" in *MMWR*. According to the report, only modest increases occurred in Tdap vaccination among adults age 19–64 years, herpes zoster vaccination among adults age ≥60 years, and HPV vaccination among women age 19–26 years; coverage among adults in the U.S. for the other vaccines did not improve. Racial/ethnic gaps in coverage persisted for all six vaccines (PPSV, Td/Tdap, hepatitis A, hepatitis B, herpes zoster, and HPV) and widened for Tdap, herpes zoster, and HPV vaccination. Increases in vaccination coverage are needed to reduce the occurrence of vaccine-preventable diseases among adults. Access the complete report at www.cdc.gov/mmwr/preview/mmwrhtml/mm6305a4.htm.

Meningococcal vaccine news

On November 27, the CDC Health Alert Network issued a CDC Health Advisory titled "Notice to Healthcare Providers: Recognizing and Reporting Serogroup B Meningococcal Disease Associated with Outbreaks at Princeton University and the University of California at Santa Barbara." Access the complete CDC HAN Health Advisory at http://emergency.cdc.gov/HAN/han00357.asp.

Human papillomavirus news

In February, the President's Cancer Panel released a report titled "Accelerating HPV Vaccine Uptake: Urgency for Action to Prevent Cancer." Access the report at http://deainfo.nci.nih.gov/advisory/pcp/annualReports/HPV/PDF/PCP_Annual_Report_2012-2013.pdf.

Looking for free educational materials you can copy for patients and staff? Visit the Immunization Action Coalition's website at

www.immunize.org/handouts

***Recommend HPV Vaccine** . . . continued from page 1*

provider recommendation is the most influential factor in parents' decisions to vaccinate."

"We must not lose track of the fact that this vaccine prevents cervical—and a number of other—cancers. It is most effective when given before infection with HPV. We are urging all physicians to recommend HPV vaccination firmly and strongly for the unvaccinated and incompletely immunized young men and women in their practices," said ACP President Molly Cooke, MD, FACP.

"As ob-gyns, we have a responsibility to encourage our patients to help protect themselves against cervical cancer by getting the HPV vaccine," said ACOG President Jeanne A. Conry, MD, PhD. "We should be routinely recommending the vaccine for all of our adolescent patients as well as women up through age 26, even if they are already sexually active. In addition, we want to encourage our patients who are mothers to vaccinate their sons and daughters at 11–12 years."

"For each year that vaccination rates among girls stay at 30% instead of 80%, 4,400 future cervical cancer cases and 1,400 cervical cancer deaths will occur," stated CDC Director Tom Frieden, MD, MPH. "CDC has created many resources to help providers address parent questions effectively so that they can strongly recommend the HPV vaccine."

Healthcare provider recommendations are the key to increasing HPV vaccination rates. By improving the strength and consistency of HPV vaccination recommendations, more patients will be protected from HPV-associated cancers and disease.

The "Dear Colleague" letter referenced in this article is found on page 6–7 of this issue of *Needle Tips.* It is also available at www.immunize.org/letter/recommend_hpv_vaccination.pdf. For an article about excellent resources to help you increase your HPV vaccination efforts, see page 2.

Give a strong recommendation for HPV vaccine to increase uptake!

Please copy and share this 2-page letter from AAFP, AAP, ACOG, ACP, CDC, and IAC with your colleagues. It's also available online at www.immunize.org/letter/recommend_hpv_vaccination.pdf.

Dear Colleague:

The American Academy of Family Physicians (AAFP), American Academy of Pediatrics (AAP), American College of Obstetricians and Gynecologists (ACOG), American College of Physicians (ACP), the Centers for Disease Control and Prevention (CDC), and the Immunization Action Coalition (IAC) are asking you to urge your patients to get vaccinated against human papillomavirus (HPV).

HPV vaccine is cancer prevention. However, HPV vaccine is underutilized in our country, despite the overwhelming evidence of its safety and effectiveness. While vaccination rates continue to improve for the other adolescent vaccines, HPV vaccination rates have not. Missed opportunities data suggest that providers are not giving strong recommendations for HPV vaccine when patients are 11 or 12 years old. The healthcare provider recommendation is the single best predictor of vaccination. Recent studies show that a patient who receives a provider recommendation is 4–5 times more likely to receive the HPV vaccine.[1,2]

What you say, and how you say it, matters. A half-hearted recommendation to a patient may not only result in the patient leaving your practice unvaccinated, but may lead the patient to believe that HPV vaccine is not as important as the other adolescent vaccines. The undersigned organizations hope that this letter, which provides key facts about HPV vaccine safety and effectiveness, will lead you to recommend HPV vaccination – firmly and strongly – to your patients. Your recommendation will reflect your commitment to prevent HPV-associated cancers and disease in the United States.

HPV-associated disease[3]

- Approximately 79 million persons in the United States are infected with HPV, and approximately 14 million people in the United States will become newly infected with HPV each year.
- Each year, an estimated 26,000 cancers are attributable to HPV; about 17,000 in women and 9,000 in men.
- Cervical cancer is the most common HPV-associated cancer among women, and oropharyngeal cancers are the most common among men.

▶ *Despite these statistics, the use of HPV vaccination to prevent HPV infection is limited and immunization rates remain low.*

Prevention of HPV-associated disease by vaccination

- Two vaccines (bivalent/HPV2 and quadrivalent/HPV4) are available to protect against HPV 16 and 18, the types that cause most cervical and other anogenital cancers, as well as some oropharyngeal cancers.
- The Advisory Committee on Immunization Practices (ACIP) recommends routine vaccination of girls age 11 or 12 years with the 3-dose series of either HPV vaccine and routine vaccination of boys age 11 or 12 years with the 3-dose series of HPV4.
- Vaccination is recommended for females through age 26 years and for males through age 21 years who were not vaccinated when they were younger.

▶ *In 2012, only 33% of teenage girls ages 13–17 years had received 3 doses of HPV vaccine.[4] This was the first year in which HPV vaccination coverage rates did not increase from the prior year.*

Safety of HPV vaccine

- More than 175 million doses of HPV vaccine have been distributed worldwide and 57 million doses have been distributed in the United States.

- More than 7 years of post-licensure vaccine safety monitoring in the United States provide continued evidence of the safety of HPV4. Data on safety are also available from post-licensure monitoring in other countries for both vaccines and provide continued evidence of the safety of HPV2 and HPV4.
- Syncope can occur among adolescents who receive any vaccines, including HPV vaccine. ACIP recommends that clinicians consider observing patients for 15 minutes after vaccination.

▶ *Regardless of a safety profile that is similar to the other adolescent vaccines, parents cite safety concerns as one of the top five reasons they do not intend to vaccinate daughters against HPV.*

Efficacy of HPV vaccines

- Among women who have not been previously infected with a targeted HPV type, both vaccines have over 95% efficacy in preventing cervical precancers caused by HPV 16 or 18.
- HPV4 also demonstrated nearly 100% vaccine efficacy in preventing vulvar and vaginal precancers, and genital warts in women caused by the vaccine types.
- In males, HPV4 demonstrated 90% vaccine efficacy in preventing genital warts and 75% vaccine efficacy in preventing anal precancers caused by vaccine types.

▶ *Since the vaccine does not protect against all HPV types, it does not replace other prevention strategies, such as regular cervical cancer screening.*

What you say matters; how you say it matters even more.

Based on research conducted with parents and physicians, CDC suggests recommending the HPV vaccine series the same way you recommend the other adolescent vaccines.

Parents may be interested in vaccinating, yet still have questions. Taking the time to listen to parents' questions helps you save time and give an effective response. CDC has created an excellent tip sheet to assist you in answering questions parents may have about HPV vaccines. This tip sheet and many other tools on the HPV vaccine are available at **www.cdc.gov/vaccines/youarethekey**.

As a healthcare provider, we urge you to improve the strength and consistency of your recommendation for HPV vaccination to your patients. Your recommendation is the number one reason why someone will get the HPV vaccine and be protected from HPV-associated cancers and disease.

Signed:

Reid B. Blackwelder, MD
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Thomas Frieden, MD
Director, Centers for Disease Control and Prevention

Molly Cooke, MD
President, American College of Physicians

Jeanne Conry, MD
President, American College of Obstetricians and Gynecologists

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Deborah Wexler, MD
Executive Director, Immunization Action Coalition

REFERENCES

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Questions Parents Ask About Vaccinations for Babies

Questions Parents Ask About Vaccinations for Babies

Why are vaccinations important?

Vaccinations protect your child against serious diseases by stimulating the immune system to create antibodies against certain bacteria or viruses.

What diseases do vaccines protect against?

Immunizing your baby with vaccines protects against serious diseases like measles, whooping cough, polio, meningococcal disease, tetanus, rotavirus, hepatitis A, hepatitis B, chickenpox, influenza, and more. Vaccines won't protect children from minor illnesses like colds, but they can keep children safe from many serious diseases.

I don't know anybody who has had these diseases. Why does my baby need these vaccines?

While a few of these diseases have virtually disappeared because of vaccination, reported cases of people with diseases like measles and whooping cough have been on the increase lately. Even if some diseases do completely disappear in the U.S., they are common in other parts of the world and are just a plane ride away. If we stop vaccinating against these diseases, many more people will become infected. Vaccinating your child will keep him or her safe.

Are there better ways to protect my baby against these diseases?

No. Breastfeeding offers temporary immunity against some minor infections like colds, but it is not an effective means of protecting a child from the specific diseases prevented by vaccines. Likewise, vitamins won't protect against the bacteria and viruses that cause these serious diseases. Chiropractic remedies, naturopathy, and homeopathy are totally ineffective in preventing vaccine-preventable diseases.

Some parents think that getting the "natural" disease is preferable to "artificial" vaccination, leading to a "natural" immunity. Some even arrange chickenpox "parties" to ensure their child gets infected. It's true that for some diseases, getting infected will lead to immunity, but the price paid for natural disease can include paralysis, brain injury, liver cancer, deafness, blindness, or even death. When you consider the seriousness of these risks, vaccination is definitely the better choice.

Are vaccines safe?

Vaccines are safe, and scientists continually work to make sure they become even safer. Every vaccine undergoes extensive testing before being licensed, and vaccine safety continues to be monitored as long as a vaccine is in use.

Most side effects from vaccination are minor, such as soreness where the injection was given or a low-grade fever. These side effects do not last long and are treatable.

Serious reactions are very rare. The tiny risk of a serious reaction from a vaccination has to be weighed against the very real risk of getting a dangerous vaccine-preventable disease.

CONTINUED ON THE NEXT PAGE ▶

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Technical content reviewed by the Centers for Disease Control and Prevention
www.immunize.org/catg.d/p4025.pdf • Item #P4025 (2/14)

Here's a helpful 2-sided handout to download, copy, and give to parents. Make as many copies as you need.

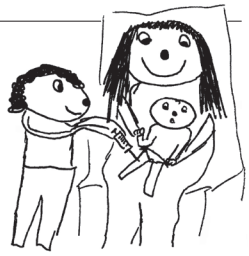
It's available at www.immunize.org/catg.d/p4025.pdf.

or s? Can d?

Yes. Your child can still get vaccinated if he or she has a mild illness, a low-grade fever, or is taking antibiotics. Talk with your child's healthcare provider if you have questions.

to ations?

At least five visits are needed before age two, but the visits can be timed to coincide with well-child check-ups. Your baby should get the first vaccine (hepatitis B) at birth, while still in the hospital. Multiple visits during the first two years are necessary because there are 14 diseases your baby can be protected against, and most require two or more doses of vaccine for the best protection.



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Your healthcare provider should let you know when the next doses are due. If you are not sure, call your healthcare provider's office to find out when your child should return for vaccinations. Doses cannot be given too close together or immunity doesn't have time to build up. On the other hand, you don't want to delay your child's vaccinations and get behind schedule because during this time, your child remains unprotected against these serious diseases.

What if I miss an appointment? Does my baby have to start the vaccines all over again?

No. If your baby misses some doses, it's not necessary to start over. Your provider will continue from where he or she left off.

How do I keep track of my baby's vaccinations?

In many medical practices, your child's immunization record is entered into an electronic record-keeping system. It's important that you keep home records too, so be sure to ask for a personal record card or a printed copy of your child's vaccinations. If you don't receive it, be sure to ask. Bring your copy of the record to all medical appointments. Whenever your child receives a vaccine, make sure your copy gets updated. Your child will benefit by having an accurate vaccination record throughout his or her life.

What if I can't afford to get my child vaccinated?

Vaccinations are free or low cost for children when families can't afford them. Call your healthcare provider or local/state health department to find out where to go for affordable vaccinations. You can access a listing of telephone numbers for state immunization programs at www.immunize.org/coordinators. Your child's health depends on timely vaccinations.

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More free handouts for parents are available at www.immunize.org/handouts/discussing-vaccines-parents.asp.

Top Ten Reasons to Protect Your Child by Vaccinating

Here are the top ten reasons to protect your child by vaccinating him or her against serious diseases.

1 Parents want to do everything possible to make sure their children are healthy and protected from preventable diseases. Vaccination is the best way to do that.

2 Vaccination protects children from serious illness and complications of vaccine-preventable diseases which can include amputation of an arm or leg, paralysis of limbs, hearing loss, convulsions, brain damage, and death.

3 Vaccine-preventable diseases, such as measles, mumps, and whooping cough, are still a threat. They continue to infect U.S. children, resulting in hospitalizations and deaths every year.

4 Though vaccination has led to a dramatic decline in the number of U.S. cases of several infectious diseases, some of these diseases are quite common in other countries and are brought to the U.S. by international travelers. If children are not vaccinated, they could easily get one of these diseases from a traveler or while traveling themselves.

5 Outbreaks of preventable diseases occur when many parents decide not to vaccinate their children.

6 Vaccination is safe and effective. All vaccines undergo long and careful review by scientists, doctors, and the federal government to make sure they are safe.

7 Organizations such as the American Academy of Pediatrics, the American Academy of Family Physicians, and the Centers for Disease Control and Prevention all strongly support protecting children with recommended vaccinations.

8 Vaccination protects others you care about, including family members, friends, and grandparents.

9 If children aren't vaccinated, they can spread disease to other children who are too young to be vaccinated or to people with weakened immune systems, such as transplant recipients and people with cancer. This could result in long-term complications and even death for these vulnerable people.

10 We all have a public health commitment to our communities to protect each other and each other's children by vaccinating our own family members.

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www.immunize.org/catg.d/p4016.pdf • Item #P4016 (2/14)

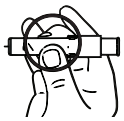
How to Administer Intradermal, Intranasal, and Oral Vaccinations

While most vaccines are administered by either intramuscular or subcutaneous injection, there are several vaccines that are administered through other means. These include the intradermal route, the intranasal route, and the oral route. Here are some simple instructions to use as a guide. Complete information is available in the package inserts and can also be obtained at www.immunize.org/packageinserts.

Intradermal (ID) administration

Fluzone by sanofi pasteur, Intradermal Inactivated Influenza Vaccine

1 Gently shake the microinjection system before administering the vaccine.

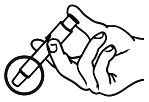


2 Hold the system by placing the thumb and middle finger on the finger pads; the index finger should remain free.

3 Insert the needle perpendicular to the skin, in the region of the deltoid, in a short, quick movement.

4 Once the needle has been inserted, maintain light pressure on the surface of the skin and inject using the index finger to push on the plunger. Do not aspirate.

5 Remove the needle from the skin. With the needle directed away from you and others, push very firmly with the thumb on the plunger to activate the needle shield. You will hear a click when the shield extends to cover the needle.



6 Dispose of the applicator in a sharps container.

Intranasal (IN) administration

FluMist by MedImmune, Live Attenuated Influenza Vaccine

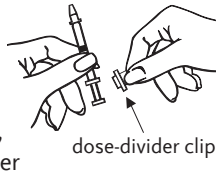
1 FluMist (LAIV) is for intranasal administration only. Do not inject FluMist.

2 Remove the rubber tip protector. Do not remove the dose-divider clip at the other end of the sprayer.

3 With the patient in an upright position (i.e., head not tilted back), place the tip just inside the nostril to ensure LAIV is delivered into the nose. The patient should breathe normally.

4 With a single motion, depress the plunger as rapidly as possible until the dose-divider clip prevents you from going further.

5 Pinch and remove the dose-divider clip from the plunger.



6 Place the tip just inside the other nostril, and with a single motion, depress plunger as rapidly as possible to deliver the remaining vaccine.

7 Dispose of the applicator in a sharps container.

Oral administration: Rotavirus vaccines

Rotateq by Merck

1 Tear open the pouch and remove the dosing tube. Clear the fluid from the dispensing tip by holding the tube vertically and tapping the cap.

2 Open the dosing tube in two easy motions:
a) Puncture the dispensing tip by screwing cap **clockwise** until it becomes tight.
b) Remove the cap by turning it **counterclockwise**.

3 Administer the dose by gently squeezing liquid into infant's mouth toward the inner cheek until dosing tube is empty. (A residual drop may remain in the tip of the tube.)

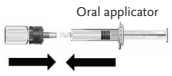
4 Discard the empty tube and cap in an approved biological waste container according to local regulations.

Note: If, for any reason, an incomplete dose is administered (e.g., infant spits or regurgitates the vaccine), a replacement dose is not recommended.

Rotarix by GlaxoSmithKline

1 Remove the cap of the vial and push the transfer adapter onto the vial (lyophilized vaccine).

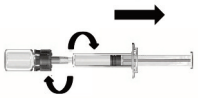
2 Shake the diluent in the oral applicator (white, turbid suspension). Connect the oral applicator to the transfer adapter.



3 Push the plunger of the oral applicator to transfer the diluent into the vial. The suspension will appear white and cloudy.

4 Withdraw the vaccine into the oral applicator.

5 Twist and remove the oral applicator from the vial.



6 Administer the dose by gently placing the applicator plunger into the infant's mouth toward the inner cheek and gently expelling the contents until the applicator is empty.

7 Discard the empty vial, cap, and oral applicator in an approved biological waste container according to local regulations.

Note: If, for any reason, an incomplete dose is administered (e.g., the infant spits or regurgitates the vaccine), a replacement dose is not recommended.

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www.immunize.org/catg.d/p2021.pdf • Item #P2021 (3/14)

Meningococcal Vaccination Recommendations by Age and/or Risk Factor

This table summarizes the recommendations of CDC's Advisory Committee on Immunization Practices for the use of meningococcal vaccine.

MCV4 = Menactra (sanofi) and Menveo (Novartis) **MCV4-D** = Menactra
MCV4-CRM = Menveo **Hib-MenCY** = MenHibrix (GlaxoSmithKline)
MPSV = Menomune (sanofi)

Targeted group by age and/or risk factor	Primary dose(s)	Booster dose(s)
People ages 11 through 18 years	Give 1 dose of MCV4, preferably at age 11 or 12 years[1]	Give booster at age 16 years if primary dose given at age 12 years or younger
		Give booster at age 16 through 18 years if primary dose given at age 13 through 15 years[2]
People ages 19 through 21 years who are first year college students living in residence halls	Give 1 dose of MCV4[1]	Give booster if previous dose given at age younger than 16 years
Travelers to or residents of countries where meningococcal disease is hyperendemic or epidemic,[3] people present during outbreaks caused by a vaccine serogroup,[4] and other people with prolonged increased risk for exposure (e.g., microbiologists routinely working with *Neisseria meningitidis*)		
• for children age 2 through 18 months	Give MCV4-CRM at ages 2, 4, 6 and 12–15 months[5]	If risk continues, give initial booster after 3 years followed by boosters every 5 years
• for children age 7 through 23 months who have not initiated a series of MCV4-CRM or Hib-MenCY	Give 2 doses, separated by 3 months,[6] of MCV4-CRM (if age 7–23 months)[7] or MCV4-D (if age 9–23 months)	
• for age 2 through 55 years	Give 1 dose of MCV4[1]	Boost every 5 years with MCV4[8,9]
• for age 56 years and older	If no previous MCV4 dose and either short-term travel or outbreak-related, give 1 dose of MPSV; all others, give 1 dose of MCV4	Boost every 5 years with MCV4[9]
People with persistent complement component deficiencies[10]		
• for age 2 through 18 months	Give MCV4-CRM or Hib-MenCY at ages 2, 4, 6 and 12–15 months	Give MCV4 booster after 3 years followed by boosters every 5 years thereafter
• for children age 7 through 23 months who have not initiated a series of MCV4-CRM or Hib-MenCY	Give 2 doses, separated by 3 months, of MCV4-CRM (if age 7–23 months)[7] or MCV4-D (if age 9–23 months)	
• for ages 2 through 55 years	Give 2 doses of MCV4, 2 months apart	Boost every 5 years with MCV4[8,11]
• for age 56 years and older	Give 2 doses of MCV4, 2 months apart	Boost every 5 years with MCV4[11]
People with functional or anatomic asplenia, including sickle cell disease		
• for age 2 through 18 months	Give MCV4-CRM or Hib-MenCY at ages 2, 4, 6 and 12–15 months	Give MCV4 booster after 3 years followed by boosters every 5 years thereafter
• for children age 19 through 23 months who have not initiated a series of MCV4-CRM or Hib-MenCY	Give 2 doses of MCV4-CRM, 3 months apart	
• for ages 2 through 55 years	Give 2 doses of MCV4, 2 months apart[12]	Boost every 5 years with MCV4[8,11]
• for age 56 years and older	Give 2 doses of MCV4, 2 months apart	Boost every 5 years with MCV4[11]

FOOTNOTES

1. If the person is HIV-positive, give 2 doses, 2 months apart.
2. The minimum interval between doses of MCV4 is 8 weeks.
3. Prior receipt of Hib-MenCY is not sufficient for children traveling to the Hajj or African meningitis belt as it doesn't provide protection against serogroups A or W.
4. Seek advice of local public health authorities to determine if vaccination is recommended.
5. Children ages 2 through 18 months who are present during outbreaks caused by serogroups C or Y may be given an age-appropriate series of Hib-MenCY.
6. If a child age 7 through 23 months will enter an endemic area in less than 3 months, give doses as close as 2 months apart.
7. If using MCV4-CRM, dose 2 should be given no younger than age 12 months.
8. If primary dose(s) given when younger than age 7 years, give initial booster after 3 years, followed by boosters every 5 years.
9. Booster doses are recommended if the person remains at increased risk.
10. Persistent complement component deficiencies include C3, C5–C9, properdin, factor H, and factor D.
11. If the person received a 1-dose primary series, give booster at the earliest opportunity, then boost every 5 years.
12. Children with functional or anatomic asplenia should complete an age-appropriate series of PCV13 vaccine before vaccination with MCV4-D; MCV4-D should be given at least 4 weeks following last dose of PCV13. MCV4-CRM or Hib-MenCY may be given at any time before or after PCV13.

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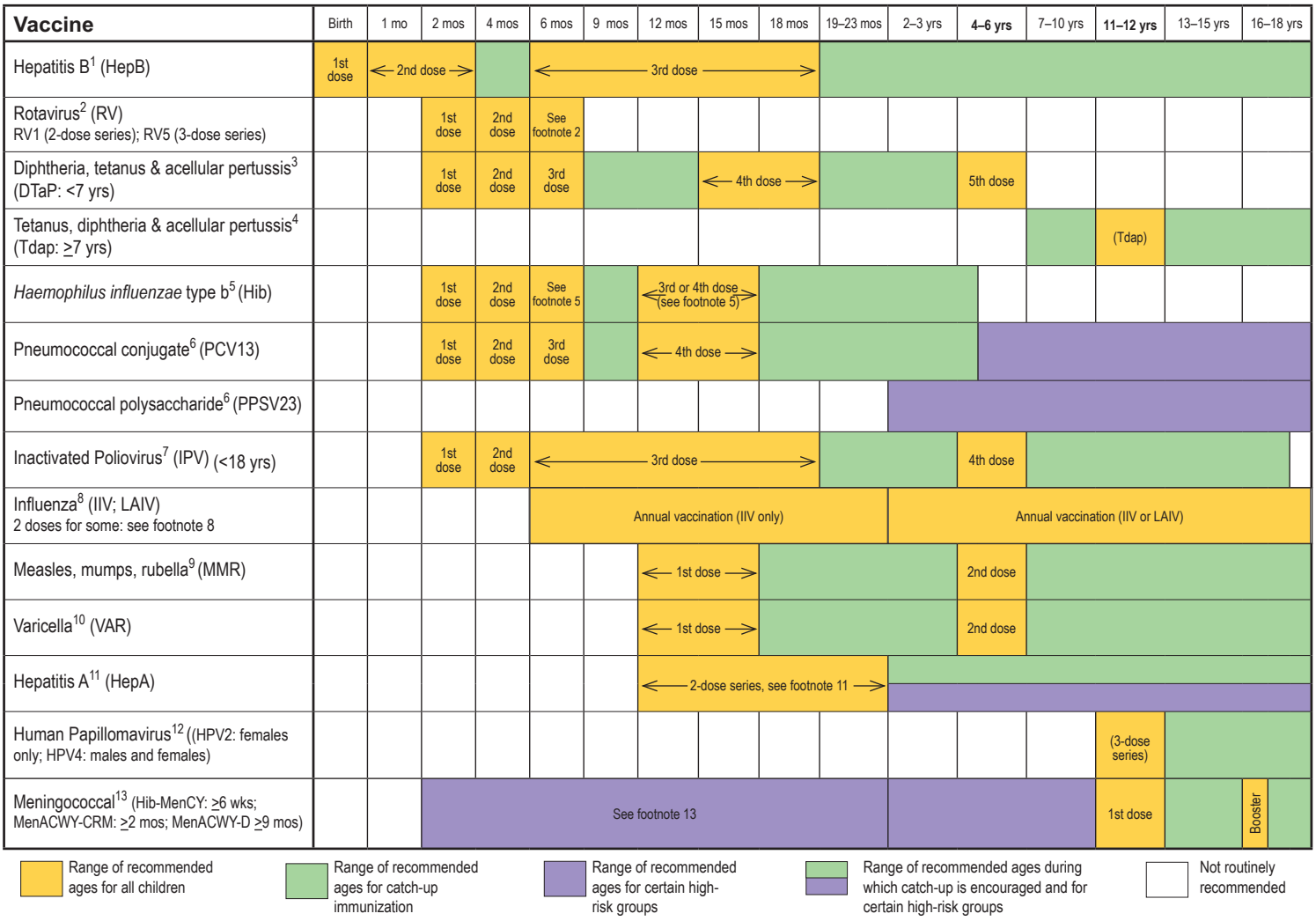
www.immunize.org/catg.d/p2018.pdf • Item #P2018 (2/14)

Figure 1. Recommended Immunization Schedule for Persons Ages 0 through 18 Years, United States, 2014

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



This schedule includes recommendations in effect as of January 1, 2014. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Vaccination providers should consult the relevant Advisory Committee on Immunization Practices (ACIP) statement for detailed recommendations, available online at www.cdc.gov/vaccines/hcp/acip-recs/index.html. Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online (www.vaers.hhs.gov) or by telephone (800-822-7967). Suspected cases of vaccine-preventable diseases should be reported to the state or local health department. Additional information, including precautions and contraindications for vaccination, is available from CDC online (www.cdc.gov/vaccines/recs/vac-admin/contraindications.htm) or by telephone (800-CDC-INFO [800-232-4636]).

Additional Vaccine Information

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

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

Figure 2. Catch-up Immunization Schedule for Persons Ages 4 Months through 18 Years Who Start Late or Who Are More Than 1 Month Behind, U. S., 2014

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

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[1]	Birth	4 weeks	8 weeks and at least 16 wks after first dose, minimum age for the final dose is 24 wks		
Rotavirus[2]	6 wks	4 weeks	4 weeks[2]		
Diphtheria, tetanus, acellular pertussis[3]	6 wks	4 weeks	4 weeks	6 months	6 months[3]
Haemophilus influenzae type B[5]	6 wks	**4 weeks** if first dose 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**[5] if current age is younger than 12 mos and first dose given before age 7 mos **8 weeks and age 12 through 59 mos (as final dose)**[5] if current age is younger than 12 mos and first dose given at 7 through 11 mos (regardless of Hib vaccine [PRP-T or PRP-OMP] used for first dose); or if current age is 12 through 59 mos and first dose given at younger than age 12 mos; or first 2 doses were PRP-OMP and given at younger than age 12 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 through 59 mos who received 3 (PRP-T) doses before age 12 mos and started primary series before age 7 mos	
Pneumococcal[6]	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) and minimum age 12 mos** This dose only necessary for children ages 12 through 59 mos who received 3 doses before age 12 mos or for children at high risk who received 3 doses at any age	
Inactivated poliovirus[7]	6 wks	4 weeks	4 weeks	**6 months**[7] minimum age 4 yrs for final dose	
Meningococcal[13]	6 wks	8 weeks[13]	see footnote 13	see footnote 13	
Measles, mumps, rubella[9]	12 mos	4 weeks			
Varicella[10]	12 mos	3 months			
Hepatitis A[11]	12 mos	6 months			
Persons ages 7 through 18 years					
Tetanus, diphtheria; tetanus, diphtheria, acellular pertussis[4]	7 yrs[4]	4 weeks	**4 weeks** if first dose of DTaP/DT given before age 12 mos **6 months** if first dose of DTaP/DT given at age 12 mos or older and then no further doses needed for catch-up	**6 months** if first dose of DTaP/DT given before age 12 mos	
Human papillomavirus[12]	9 yrs	Routine dosing intervals are recommended[12]			
Hepatitis A[11]	12 mos	6 months			
Hepatitis B[1]	Birth	4 weeks	8 weeks (and at least 16 wks after first dose)		
Inactivated poliovirus[7]	6 wks	4 weeks	4 weeks[7]	6 months[7]	
Meningococcal[13]	6 wks	8 weeks[13]			
Measles, mumps, rubella[9]	12 mos	4 weeks			
Varicella[10]	12 mos	**3 months** if person is younger than age 13 yrs **4 weeks** if person is age 13 yrs or older			

Footnotes: Recommended Immunization Schedule for Persons Ages 0 through 18 Years, United States, 2014

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

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

Routine vaccination:

At birth:

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

Doses following the birth dose:

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

(continued)

- Administration of a total of 4 doses of HepB vaccine is permitted when a combination vaccine containing HepB is administered after the birth dose.

Catch-up vaccination

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

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

Routine vaccination:

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

Catch-up vaccination:

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

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

Routine vaccination:

- Administer a 5-dose series of DTaP vaccine at ages 2, 4, 6, and 15 through 18 months, and 4 through 6 years. The fourth dose may be administered as early as age 12 months, provided at least 6 months have elapsed since the third dose.

Catch-up vaccination:

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

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

Routine vaccination:

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

Catch-up vaccination:

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

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

Routine vaccination:

- Administer a 2- or 3-dose Hib vaccine primary series and a booster dose (dose 3 or 4, depending on vaccine used in primary series) at age 12 through 15 months to complete a full Hib vaccine series.
- The primary series with ActHIB, MenHibrix or Pentacel consists of 3 doses and should be administered at ages 2, 4, and 6 months. The primary series with PedvaxHib or COMVAX consists of 2 doses and should be administered at ages 2 and 4 months; a dose at age 6 months is not indicated.
- One booster dose (dose 3 or 4, depending on the vaccine used in primary series) of any Hib vaccine should be administered at age 12 through 15 months. An exception is Hiberix vaccine. Hiberix should only be used for the booster (final) dose in children ages 12 months through 4 years who have received at least 1 prior dose of Hib-containing vaccine.
- For recommendations on the use of MenHibrix in patients at increased risk for meningococcal disease, refer to the meningococcal vaccine footnote and also to *MMWR* 2013; 62 (No. RR-2):1–22, available at www.cdc.gov/mmwr/pdf/rr/rr6202.pdf.

Catch-up vaccination:

- If dose 1 was administered at ages 12 through 14 months, administer a second (final) dose at least 8 weeks after dose 1, regardless of Hib vaccine used in the primary series.
- If the first 2 doses were PRP-OMP (PedvaxHIB or COMVAX), and were administered at age 11 months or younger, the third (and final) dose should be administered at age 12 through 15 months and at least 8 weeks after the second dose.
- If the first dose was administered at age 7 through 11 months, administer the second dose at least 4 weeks later and a third (and final) dose at age 12 through 15 months or 8 weeks after the second dose, whichever is later, regardless of Hib vaccine used for first dose.
- If the first dose was administered at younger than age 12 months and second dose is administered between 12 and 14 months, a third (and final) dose should be administered 8 weeks later.
- For unvaccinated children ages 15 months or older, administer only 1 dose.
- For other catch-up guidance, see Figure 2. For catch-up guidance related to MenHibrix, refer to the meningococcal vaccine footnote and also to *MMWR* 2013; 62 (No. RR-2):1–22, available at www.cdc.gov/mmwr/pdf/rr/rr6202.pdf.

Vaccination of persons with high-risk conditions:

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

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

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

Routine vaccination with PCV13:

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

Catch-up vaccination:

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

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

- All recommended PCV13 doses should be administered prior to PPSV23 vaccination if possible.
- For children ages 2 through 5 years with any of the following conditions: chronic heart disease (particularly cyanotic congenital heart disease and cardiac failure); chronic lung disease (including asthma if treated with high-dose oral corticosteroid therapy); diabetes mellitus; cerebrospinal fluid leak; cochlear implant; sickle cell disease and other hemoglobinopathies; anatomic or functional asplenia; HIV infection; chronic renal failure; nephrotic syndrome; diseases associatead with treatment with immunosuppressive drugs or radiation therapy, including malignant neoplasms, leukemias, lymphomas, and Hodgkin disease; solid organ transplantation; or congenital immunodeficiency:
  1. Administer 1 dose of PCV13 if 3 doses of PCV (PCV7 and/or PCV13) were received previously.
  2. Administer 2 doses of PCV13 at least 8 weeks apart if fewer than 3 doses of PCV (PCV7 and/or PCV13) were received previously.
  3. Administer 1 supplemental dose of PCV13 if 4 doses of PCV7 or other age-appropriate complete PCV7 series was received previously.
  4. The minimimum interval between doses of PCV (PCV7 and/or PCV13) is 8 weeks.
  5. For children with no history of PPSV23 vaccination, administer PPSV23 at least 8 weeks after the most recent dose of PCV13.
- For high-risk children ages 6 through 18 years who have cerebrospinal fluid leak; cochlear implant; sickle cell disease and other hemoglobinopathies; anatomic or functional asplenia; congenital or acquired immunodeficiencies; HIV infection; chronic renal failure; nephrotic syndrome; diseases associated with treatment with immunosuppressive drugs or radiation therapy, including malignant neoplasms, leukemias, lymphomas, and Hodgkin disease; generalized malignancy; solid organ transplantion; or multiple myeloma:
  1. If neither PCV13 nor PPSV23 has been received preciously, administer 1 dose of PCV13 now and 1 dose of PPSV23 at least 8 weeks later.
  2. If PCV13 has been received previously but PPSV23 has not, administer 1 dose of PPSV23 at least 8 weeks after the most recent dose of PCV13.
  3. If PPSV23 has been received but PCV13 has not, administer 1 dose of PCV13 at least 8 weeks after the most recent dose of PPSV23.
- For children ages 6 through 18 years with chronic heart disease (particularly cyanotic congenital heart disease and cardiac failure), chronic lung disease (including asthma if treated with high-dose oral corticosteroid therapy), diabetes melliltus, alcoholism, or chronic liver disease, who have not received PPSV23, administer 1 dose of PPSV23. If PCV13 has been received previously, then PPSV23 should be administered at least 8 weeks after any prior PCV13 dose.
- A single revaccination with PPSV23 should be administered 5 years after the first dose to children with sickle cell disease or other hemoglobinopathies; anatomic or functional asplenia; congenital or acquired immunodeficiencies; HIV infection; chronic renal failure; nephrotic syndrome; diseases associated with treatment with immunosuppressive drugs or radiation therapy, including malignant neoplasms, leukemias, lymphomas, and Hodgkin disease; generalized malignancy; solid organ transplantation; or multiple myeloma.

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

Routine vaccination:

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

(continued)

Catch-up vaccination:

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

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

Routine vaccination:

- Administer influenza vaccine annually to all children beginning at age 6 months. For most healthy, non-pregnant persons ages 2 through 49 years, either LAIV or IIV may be used. However, LAIV should not be administered to some persons, including 1) those with asthma, 2) children age 2 through 4 years who had wheezing in the past 12 months, or 3) those who have any other underlying medical conditions that predispose them to influenza complications. For all other contraindications to use of LAIV, see *MMWR* 2013;62(No. RR-7):1–43, available at www.cdc.gov/mmwr/pdf/rr/rr6207.pdf.

For children ages 6 months through 8 years:

- For the 2013–14 season, administer 2 doses (separated by at least 4 weeks) to children who are receiving influenza vaccine for the first time. Some chldren in this age group who have been vaccinated previously will also need 2 doses. For additional guidance, follow dosing guidelines in the 2013–2014 ACIP influenza vaccine recommendations, *MMWR* 2013;62(No. RR-7):1–43, available at www.cdc.gov/mmwr/pdf/rr6207.pdf.
- For the 2014–15 season, follow dosing guidelines in the 2014 ACIP influenza vaccine recommendations.

For persons ages 9 years and older:

- Administer 1 dose.

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

Routine vaccination:

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

Catch-up vaccination:

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

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

Routine vaccination:

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

Catch-up vaccination:

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

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

Routine vaccination:

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

Catch-up vaccination:

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

Special populations:

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

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

Routine vaccination:

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

Catch-up vaccination:

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

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

Routine vaccination:

- Administer a single dose of Menactra or Menveo vaccine at age 11 through 12 years, with a booster dose at age 16 years.
- Adolescents ages 11 through 18 years with human immunodeficiency virus (HIV) infection should receive a 2-dose primary series of Menactra or Menveo with at least 8 weeks between doses.
- For children ages 2 months through 10 years with high-risk conditions, see below.

Catch-up vaccination:

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

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

- Children with anatomic or functional asplenia (including sickle cell disease):
  1. For children younger than age 19 months, administer a 4-dose infant series of MenHibrix or Menveo at ages 2, 4, 6 and 12 through 15 months.
  2. For children age 19 through 23 months who have not completed a series of MenHibrix or Menveo, administer 2 primary doses of Menveo at least 3 months apart.
  3. For children age 24 months or older, who have not received a complete series of MenHibrix, Menveo, or Menactra, administer 2 primary doses of either Menactra or Menveo at least 3 months apart. If Menactra is administered to a child with asplenia (including sickle cell disease), do not administer Menactra until age 2 years and at least 4 weeks after the completion of all PCV13 doses.
- Children with persistent complement component deficiency:
  1. For children younger than age 19 months, administer a 4-dose infant series of either MenHibrix or Menveo at ages 2, 4, 6 and 12 through 15 months.
  2. For children age 7 through 23 months who have not initiated vaccination, two options exist depending on age and vaccine brand: a) for children who initiate vaccination with Menveo at age 7 through 23 months, a 2-dose series should be administered, with the second dose administered after age 12 months and at least 3 months after the first dose; b) for children who initiate vaccination with Menactra at age 9 through 23 months, a 2-dose series should be administered at least 3 months apart; c) for children age 24 months or older who have not completed a series of MenHibrix, Menveo, or Menactra, administer 2 primary doses of either Menactra or Menveo at least 2 months apart.
- For children who travel to or reside in countries in which meningococcal disease is hyperendemic or epidemic, including countries in the African meningitis belt or the Hajj, administer an age-appropriate formulation and series of Menactra or Menveo for protection against serogroups A and W meningococcal disease. Prior receipt of MenHibrix is not sufficient for children traveling to the meningitis belt or the Hajj because it does not contain serogroups A or W.
- For children at risk during a comunity outbreak attributable to a vaccine serogroup, administer or complete an age- and formulation-appropriate series of MenHibrix, Menactra, or Menveo.
- For booster doses among persons with high-risk conditions, refer to *MMWR* 2013;62(No. RR-2) at www.cdc.gov/mmwr/pdf/rr/rr6202.pdf.

Catch-up recommendations for persons with high-risk conditions

- If MenHibrix is administered to achieve protection against meningococcal disease, a complete age-appropriate series of MenHibrix should be administered.
- If the first dose of MenHibrix is administered at age 12 months or older, a total of 2 doses should be administered at least 8 weeks apart to ensure protection against serogroups C and Y meningococcal disease.
- For children who inititate vaccination with Menveo at age 7 through 9 months, a 2-dose series should be administered with the second dose after age 12 months and at least 3 months after the first dose.
- For other catch-up recommendations for these persons, refer to *MMWR* 2013;62(No. RR-2) at www.cdc.gov/mmwr/pdf/rr/rr6202.pdf.

For complete information on use of meningococcal vaccines, including issues related to vaccination of persons at increased risk of infection, see Prevention and Control of Meningococcal Disease: Recommendations of the ACIP. *MMWR* 2013;62(No. RR-2) at www.cdc.gov/mmwr/pdf/rr/rr6202.pdf.

Recommended Adult Immunization Schedule – United States, 2014

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

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

Vaccine	19–21 years	22–26 years	27–49 years	50–59 years	60–64 years	≥65 years
Influenza[2,*]	1 dose annually					
Tetanus, diphtheria, pertussis (Td/Tdap)[3,*]	Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs					
Varicella[4,*]	2 doses					
Human papillomavirus (HPV) Female[5,*]	3 doses					
Human papillomavirus (HPV) Male[5,*]	3 doses					
Zoster[6]					1 dose	
Measles, mumps, rubella (MMR)[7,*]	1 or 2 doses					
Pneumococcal 13-valent conjugate PCV13)[8,*]	1 dose					
Pneumococcal polysaccharide (PPSV23)[9,10]	1 or 2 doses					1 dose
Meningococcal[11,*]	1 or more doses					
Hepatitis A[12,*]	2 doses					
Hepatitis B[13,*]	3 doses					
Haemophilus influenzae type b (Hib)[14,*]	1 or 3 doses					

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

Vaccine	Pregnancy	Immunocompromising conditions (excluding human immunodeficiency virus [HIV])[4,6,7,8,15]	HIV Infection CD4+ T lymphocyte count[4,6,7,8,15] <200 cells/μL	HIV Infection CD4+ T lymphocyte count[4,6,7,8,15] ≥200 cells/μL	Men who have sex with men (MSM)	Kidney failure, end-stage renal disease, receipt of hemodialysis	Heart disease, chronic lung disease, chronic alcoholism	Asplenia (including elective splenectomy and persistent complement component deficiencies)[8,14]	Chronic liver disease	Diabetes	Healthcare personnel
Influenza[2,*]	1 dose IIV annually				I dose IIV or LAIV annually	I dose IIV annually					I dose IIV or LAIV annually
Td/Tdap[3,*]	1 dose Tdap in each pregnancy	Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs									
Varicella[4,*]	Contraindicated			2 doses							
HPV Female[5,*]		3 doses through age 26 yrs				3 doses through age 26 yrs					
HPV Male[5,*]		3 doses through age 26 yrs				3 doses through age 21 yrs					
Zoster[6,*]	Contraindicated				1 dose						
MMR[7,*]	Contraindicated			1 or 2 doses							
PCV13[8,*]						1 dose					
PPSV23[9,10]						1 or 2 doses					
Meningococcal[11,*]	1 or more doses										
Hepatitis A[12,*]						2 doses					
Hepatitis B[13,*]			3 doses								
Hib[14*]		Post-HSCT recipients only	1 or 3 doses								

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

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

These schedules indicate the recommended age groups and medical indications for which administration of currently licensed vaccines is commonly indicated for adults ages19 years and older, as of February 1, 2014. For all vaccines being recommended on the Adult Immunization Schedule: a vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Licensed combination vaccines may be used whenever any components of the combination are indicated and when the vaccine's other components are not contraindicated. For detailed recommendations on all vaccines, including those used primarily for travelers or that are issued during the year, consult the manufacturers' package inserts and the complete statements from the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/hcp/acip-recs/index.html). Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

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), and American College of Physicians (ACP), American College of Obstetricians and Gynecologists (ACOG), and American College of Nurse-Midwives (ACNM).

Footnotes

1. Additional Information

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

2. Influenza vaccination.

- Annual vaccination against influenza is recommended for all persons age 6 months and older.
- Persons age 6 months and older, including pregnant women, and persons with hives only allergy to eggs, can receive the inactivated influenza vaccine (IIV). An age-appropriate IIV vaccine formulation should be used.
- Adults age 18 through 49 years can receive the recombinant influenza vaccine (RIV) (Flublok). RIV does not contain any egg protein.
- Healthy, nonpregnant persons age 2 through 49 years without high-risk medical conditions can receive either intranasally administered live, attenuated influenza vaccine (LAIV) (FluMist), or IIV. Healthcare personnel who care for severely immunocompromised persons (i.e., those who require care in a protected environment) should receive IIV or RIV rather than LAIV.
- The intramuscularly or intradermally administered IIV are options for adults age 18 through 64 years.
- Adults age 65 years or older can receive the standard-dose IIV or the high-dose IIV (Fluzone High-Dose).

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

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

4. Varicella vaccination.

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

5. Human papillomavirus (HPV) vaccination.

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

6. Zoster vaccination.

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

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

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

8. Pneumococcal conjugate (PCV13) vaccination.

- Adults age 19 years or older with immunocompromising conditions (including chronic renal failure and nephrotic syndrome), functional or anatomic asplenia, cerebrospinal fluid leaks, or cochlear implants who have not previously received PCV13 or PPSV23 should receive a single dose of PCV13 followed by a dose of PPSV23 at least 8 weeks later.
- Adults age 19 years or older with the aforementioned conditions who have previously received 1 or more doses of PPSV23 should receive a dose of PCV13 1 or more years after the last PPSV23 dose was received. For adults who require additional doses of PPSV23, the first such dose should be given no sooner than 8 weeks after PCV13 and at least 5 years since the most recent dose of PPSV23.
- When indicated, PCV13 should be administered to patients who are uncertain of their vaccination status history and have no record of previous vaccination.
- Although PCV13 is licensed by the U.S. Food and Drug Administration for use among and can be administered to persons age 50 years and older, ACIP recommends PCV13 for adults age 19 years and older with the specific medical conditions noted above.

9. Pneumococcal polysaccharide (PPSV23) vaccination.

- When PCV13 is also indicated, PCV13 should be given first (see footnote 8).
- Vaccinate all persons with the following indications:
  - all adults age 65 years and older;
  - adults younger than age 65 years with chronic lung disease (including chronic obstructive pulmonary disease, emphysema, and asthma); chronic cardiovascular diseases; diabetes mellitus; chronic renal failure; nephrotic syndrome; chronic liver disease (including cirrhosis); alcoholism; cochlear implants; cerebrospinal fluid leaks;

(continued)

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 immunocompromising conditions and other selected conditions are recommended to receive PCV13 and PPSV23 vaccines. See footnote 8 for information on timing of PCV13 and PPSV23 vaccinations.
- 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 PPSV23 vaccine is not recommended for American Indians/Alaska Natives or persons younger than age 65 years unless they have underlying medical conditions that are PPSV23 indications. However, public health authorities may consider recommending PPSV23 for American Indians/Alaska Natives who are living in areas where the risk for invasive pneumococcal disease is increased.
- When indicated, PPSV23 should be administered to patients who are uncertain of their vaccination status and there is no record of previous vaccination.

10. Revaccination with PPSV23.

- One-time revaccination 5 years after the first dose of PPSV23 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 immunocompromising conditions.
- Persons who received 1 or 2 doses of PPSV23 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 of PPSV23 are needed for persons vaccinated with PPSV23 at or after age 65 years.

11. Meningococcal vaccination.

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

12. Hepatitis A vaccination.

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

13. Hepatitis B vaccination.

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

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

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

15. Immunocompromising conditions.

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

Report all clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting System (VAERS). Reporting forms and instructions on filing a VAERS report are available at www.vaers.hhs.gov or by telephone, 800-822-7967. Information on how to file a Vaccine Injury Compensation Program claim is available at www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382. 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.

Before you vaccinate adults, consider their "H-A-L-O"!

What is H-A-L-O? As shown below, it's an easy-to-use chart that can help you make an *initial* decision about vaccinating a patient based on four factors—the patient's **H**ealth condition, **A**ge, **L**ifestyle, and **O**ccupation. In some situations, though, you can vaccinate a patient without considering these factors. For example, all adults need a dose of Tdap as well as annual vaccination against influenza, and any adult who wants protection against hepatitis A or hepatitis B can be vaccinated. Note that not all patients who mention one or more **H-A-L-O** factors will need to be vaccinated. Before you make a *definitive* decision about vaccinating your patient, it's important that you refer to the more detailed information found in the Immunization Action Coalition's "Summary of Recommendations for Adult Immunization," located at www.immunize.org/catg.d/p2011.pdf or the complete vaccine recommendations of the Centers for Disease Control and Prevention's Advisory Committee on Immunization Practices (ACIP) at www.cdc.gov/vaccines/pubs/ACIP-list.htm.

How do I use H-A-L-O? Though some **H-A-L-O** factors can be easily determined (e.g., age, pregnancy), you will need to ask your patient about the presence or absence of others. Once you determine which of the factors apply, scan down each column of the chart to see at a glance which vaccinations are *possibly* indicated (they are shown with a check mark).

H-A-L-O checklist of factors that indicate a possible need for adult vaccination

Vaccine	**H**ealth factors									**A**ge factors	**L**ifestyle factors							**O**ccupational or other factors				
	Pregnant	Certain chronic diseases	Immunosuppressed (including HIV)	History of STD	Asplenia	Cochlear implant candidate/recipient	Organ transplant (for stem cell transplant, see ACIP's General Recommendations on Immunization)	CSF leaks	Alcoholism		Born outside the U.S.	Men who have sex with men	Not in a long-term, mutually monogamous relationship	User of injecting or non-injecting drugs	International traveler	Close contact of international adoptee	Cigarette smoker	College students	Parent or caregiver of a young child	Healthcare worker	Certain lab workers	Adults in institutional settings (e.g., chronic care, correctional)
HepA		✔										✔		✔	✔	✔					✔	
HepB		✔	✔	✔							✔	✔	✔	✔	✔					✔		✔
Hib		✔	✔		✔																	
HPV (females)										Through 26 yrs												
HPV (males)			✔							Routine through 21 yrs; risk-based 22–26 yrs		✔										
IPV															✔						✔	
Influenza	Annual vaccination is recommended for all adults ····►																					
Meningococcal		✔			✔										✔			✔			✔	
MMR			?							Routine 1 dose if born after 1956; 2nd dose for some					✔			✔		✔		
PCV13		✔	✔		✔	✔	✔	✔														
PPSV23		✔	✔		✔	✔	✔	✔	✔	65 yrs & older							✔					✔
Tdap	A single dose is recommended for all adults; pregnant women should receive Tdap during each pregnancy ····►																					
Varicella	Completion of a 2-dose series is recommended for non-pregnant adults through age 59 years who do not have evidence of immunity to varicella ····►																					
Zoster										60 yrs & older												

? = Vaccination may be indicated depending on degree of immunosuppression.

Immunization Action Coalition 1573 Selby Avenue ▪ St. Paul, MN 55104 ▪ 651-647-9009 ▪ www.immunize.org ▪ www.vaccineinformation.org

Technical content reviewed by the Centers for Disease Control and Prevention
www.immunize.org/catg.d/p3070.pdf ▪ Item #P3070 (11/13)

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

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

(continued on page 2)

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

Vaccine	Contraindications	Precautions
Influenza, inactivated injectable (IIV)[9]	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose of any influenza vaccine or to a vaccine component, including egg protein	• Moderate or severe acute illness with or without fever • History of GBS within 6 weeks of previous influenza vaccination • Persons who experience only hives with exposure to eggs may receive RIV (if age 18–49 years) or, with additional safety precautions, IIV.[9]
Influenza, recombinant (RIV)[9]	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose of RIV or to a vaccine component. RIV does not contain any egg protein.[9]	• Moderate or severe acute illness with or without fever • History of GBS within 6 weeks of previous influenza vaccination
Influenza, live attenuated (LAIV)[4,9]	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose of any influenza vaccine or to a vaccine component, including egg protein • Conditions for which the ACIP recommends against use, but which are not contraindications in vaccine package insert: immune suppression, certain chronic medical conditions such as asthma, diabetes, heart or kidney disease, and pregnancy[4,9]	• Moderate or severe acute illness with or without fever • History of GBS within 6 weeks of previous influenza vaccination • Receipt of specific antivirals (i.e., amantadine, rimantadine, zanamivir, or oseltamivir) 48 hours before vaccination. Avoid use of these antiviral drugs for 14 days after vaccination.
Human papillomavirus (HPV)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component	• Moderate or severe acute illness with or without fever • Pregnancy
Meningococcal: conjugate (MenACWY), polysaccharide (MPSV4)	• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component	• Moderate or severe acute illness with or without fever
Zoster (HZV)[4]	• Severe allergic reaction (e.g., anaphylaxis) to a vaccine component • Known severe immunodeficiency (e.g., from hematologic and solid tumors, receipt of chemotherapy, or long-term immunosuppressive therapy[5] or patients with HIV infection who are severely immunocompromised). • Pregnancy	• Moderate or severe acute illness with or without fever • Receipt of specific antivirals (i.e., acyclovir, famciclovir, or valacyclovir) 24 hours before vaccination; avoid use of these antiviral drugs for 14 days after vaccination.

Footnotes

1. Vaccine package inserts and the full ACIP recommendations for these vaccines should be consulted for additional information on vaccine-related contraindications and precautions and for more information on vaccine excipients. Events or conditions listed as precautions should be reviewed carefully. Benefits of and risks for administering a specific vaccine to a person under these circumstances should be considered. If the risk from the vaccine is believed to outweigh the benefit, the vaccine should not be administered. If the benefit of vaccination is believed to outweigh the risk, the vaccine should be administered. A contraindication increases the chance of a serious adverse reaction. Therefore, a vaccine should not be administered when a contraindication is present. Whether and when to administer DTaP to children with proven or suspected underlying neurologic disorders should be decided on a case-by-case basis.
2. Hepatitis B vaccination should be deferred for preterm infants and infants weighing less than 2000 g if the mother is documented to be hepatitis B surface antigen (HBsAg)-negative at the time of the infant's birth. Vaccination can commence at chronological age 1 month or at hospital discharge. For infants born to women who are HBsAg-positive, hepatitis B immunoglobulin and hepatitis B vaccine should be administered within 12 hours of birth, regardless of weight.
3. For details, see CDC. "Prevention of Rotavirus Gastroenteritis among Infants and Children: Recommendations of the Advisory Committee on Immunization Practices. (ACIP)" *MMWR* 2009;58(No. RR–2), available at www.cdc.gov/vaccines/hcp/acip-recs/index.html.
4. LAIV, MMR, varicella, and zoster vaccines can be administered on the same day. If not administered on the same day, these live vaccines should be separated by at least 28 days.
5. Immunosuppressive steroid dose is considered to be 2 or more weeks of daily receipt of 20 mg prednisone or equivalent. Vaccination should be deferred for at least 1 month after discontinuation of such therapy. Providers should consult ACIP recommendations for complete information on the use of specific live vaccines among persons on immune-suppressing medications or with immune suppression because of other reasons.
6. HIV-infected children may receive varicella and measles vaccine if CD4+ T-lymphocyte count is >15%. (Source: Adapted from American Academy of Pediatrics. Immunization in Special Clinical Circumstances. In: Pickering LK, ed. *Red Book: 2012 Report of the Committee on Infectious Diseases.* 29th ed. Elk Grove Village, IL: American Academy of Pediatrics: 2012.)
7. Vaccine should be deferred for the appropriate interval if replacement immune globulin products are being administered (see "General Recommendations on Immunization: Recommendations of the Advisory Committee on Immunization Practices (ACIP)" *MMWR* 2011;60(No. RR-2) available at www.cdc.gov/vaccines/hcp/acip-recs/index.html.)
8. Measles vaccination might suppress tuberculin reactivity temporarily. Measles-containing vaccine may be administered on the same day as tuberculin skin testing. If testing cannot be performed until after the day of MMR vaccination, the test should be postponed for at least 4 weeks after the vaccination. If an urgent need exists to skin test, do so with the understanding that reactivity might be reduced by the vaccine.
9. For more information on use of influenza vaccines among persons with egg allergies and a complete list of conditions that CDC considers to be reasons to avoid getting LAIV, see CDC. Prevention and Control of Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices (ACIP) — United States, 2013–14. *MMWR* 2013;62(No. RR07):1–43, available at www.cdc.gov/vaccines/hcp/acip-recs.html.

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

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

parents reported for not vaccinating daughters.

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

- CDC's "Tips and Time-savers for Talking with Parents about HPV Vaccine," available at www.cdc.gov/vaccines/who/teens/for-hcp-tipsheet-hpv.pdf.
- IAC's "Human Papillomavirus HPV: A Parent's Guide to Preteen and Teen HPV Vaccination," available at www.immunize.org/catg.d/p4250.pdf.

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

DTaP and Tdap vaccines

A 17-year-old received a dose of Tdap vaccine when she was 12 years old. She is now pregnant. Should she get another dose of Tdap vaccine?

Yes. ACIP recommends a dose of Tdap during each pregnancy irrespective of the patient's prior history of receiving Tdap. To maximize the maternal antibody response and passive antibody transfer to the infant, optimal timing for Tdap administration is between 27 and 36 weeks gestation. For more information, see www.cdc.gov/mmwr/pdf/wk/mm6207.pdf, page 131.

If Kinrix (DTaP-IPV; GSK) is inadvertently given to a child age 15 through 18 months, as the fourth DTaP dose and the third IPV dose, do the DTaP and IPV doses need to be repeated?

No, as long as minimum intervals between previous doses have been met. Kinrix is licensed and recommended only for children age 4 through 6 years. You should take measures to prevent this vaccine administration error in the future. However, you can count this as a valid dose for both DTaP and IPV as long as you met the minimum interval between administering dose #3 and dose #4 of DTaP (6 months) and dose #2 and dose #3 of IPV (4 weeks).

Influenza vaccine

May Fluzone High-Dose (sanofi) be administered to patients younger than age 65 years?

No. Fluzone High-Dose is licensed only for persons age 65 years and older and is not recommended for younger people. See *MMWR*, April 30, 2010, available at www.cdc.gov/mmwr/preview/mmwrhtml/mm5916a2.htm for details about the licensure of this vaccine.

MMR and varicella vaccines

Would you consider a healthcare provider with 2 documented doses of MMR vaccine (Merck) to be immune even if their serology for 1 or more of the antigens comes back negative?

Yes. Healthcare personnel (HCP) with 2 documented doses of MMR vaccine are considered to be immune regardless of the results of a subsequent serologic test for measles, mumps, or rubella. Documented age-appropriate vaccination supersedes the results of subsequent serologic testing. HCP who do not have documentation of MMR vaccination and whose serologic test is interpreted as "indeterminate" or "equivocal" should be considered not immune and should receive 2 doses of MMR. ACIP does not recommend serologic testing after vaccination. For more information, see ACIP's recommendations on the use of MMR at www.cdc.gov/mmwr/pdf/rr/rr6204.pdf, page 22.

I have patients who claim to remember receiving MMR vaccine but have no written record, or whose parents report the patient has been vaccinated. Should I accept this as evidence of vaccination?

No. Self-reported doses and history of vaccination provided by a parent or other caregiver are not considered valid. You should only accept a written, dated record as evidence of vaccination.

We have adult patients in our practice at high risk for measles, including patients going back to college or preparing for international travel, who don't remember ever receiving MMR vaccine or having had measles disease. How should we manage these patients?

You have two options. You can test for immunity or you can just give 2 doses of MMR at least 4 weeks apart. There is no harm in giving MMR vaccine to a person who may already be immune to one or more of the vaccine viruses. If you or the patient opt for testing, and the tests indicate the patient is not immune to one or more of the vaccine components, give your patient 2 doses of MMR at least 4 weeks apart. If any test results are indeterminate or equivocal, consider your patient nonimmune. ACIP does not recommend serologic testing after vaccination because commercial tests may not be sensitive enough to reliably detect vaccine-induced immunity.

I have a 45-year-old patient who is traveling to Jordan to work with Syrian refugees. She doesn't recall ever getting a second dose of MMR (she didn't go to college and never worked in healthcare). She was rubella immune when pregnant 20 years ago. Her measles titer is negative. Would you recommend a second dose of MMR vaccine?

Yes. ACIP recommends 2 doses of MMR given at least 4 weeks apart for any adult born in 1957 or later who plans to travel internationally. There is no harm in giving MMR vaccine to a person who may already be immune to one or more of the vaccine viruses.

If a 5-year-old child has never received any doses of MMR or varicella vaccine and now the parents want him to catch up with the combination vaccine MMRV (ProQuad; Merck), what is the spacing requirement between the two doses?

Twelve weeks. The spacing between doses of a combination vaccine depends on the longest minimum interval of a component. The minimum interval between doses of MMR is 4 weeks; the minimum interval between doses of varicella vaccine is 12 weeks for a child this age. So you should wait 12 weeks between the doses of MMRV for the two doses to be valid.

MMRV was mistakenly given to a 31-year-old instead of MMR. Can this be considered a valid dose?

Yes, however, this issue is not addressed in the 2010 MMRV ACIP recommendations. Although this is off-label use, CDC recommends that when a dose of MMRV is inadvertently given to a patient age 13 years and older, it may be counted towards completion of the MMR and varicella vaccine series and does not need to be repeated.

Hepatitis B vaccine

On December 20, 2013, CDC published a new guidance document titled "CDC Guidance for Evaluating Health-Care Personnel for Hepatitis B Virus Protection and for Administering Post-exposure Management" (MMWR 2013;62[RR-10]). What is new in this document?

The document provides a comprehensive review of the epidemiology of hepatitis B virus (HBV) infection among healthcare personnel (HCP), updated information about the persistence of anti-HBs antibody following vaccination and the duration of vaccine-induced protection, and new information about HCP serologic testing and postexposure prophylaxis. The document, available at www.cdc.gov/mmwr/pdf/rr/rr6210.pdf, updates recommendations made in the 2011 Immunization of Health-Care Personnel recommendations (*MMWR* 2011;60[RR-7] available at www.cdc.gov/mmwr/pdf/rr/rr6007.pdf) and the 2006 adult hepatitis B vaccine ACIP recommendations (*MMWR* 2006;55[RR-16] available at www.cdc.gov/mmwr/PDF/rr/rr5516.pdf).

An important new recommendation is for the management of HCP who have written documentation of a complete series of hepatitis B vaccine doses in the past (including those vaccinated as infants, children, and adolescents) who were not tested for antibody response following the vaccination series and who now test negative for antibody to hepatitis B surface antigen (anti-HBs) defined as anti-HBs less than 10 mIU/mL. It is now recom-

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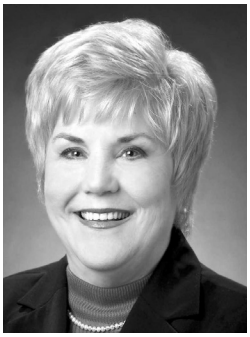
IAC's "Ask the Experts" team from CDC

Andrew T. Kroger, MD, MPH



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mended to administer 1 dose of hepatitis B vaccine to these individuals and then test for anti-HBs 1 to 2 months later. Those who test positive after the single "booster" dose are considered to be immune and no further testing or vaccination is needed. Those who test negative after the "booster" dose should receive 2 additional doses to complete a second 3-dose series. Anti-HBs testing should be repeated 1 to 2 months after completion of the second vaccination series. An algorithm is provided on page 13 of the new guidance document to assist clinicians with this process.

Another new recommendation in the guidance concerns the management of HCP who need postexposure prophylaxis. In the section titled "Post Exposure Management" on page 12, the document provides detailed recommendations for more combinations of HCP vaccination/serologic status and source patient status than in previous recommendations. A revised postexposure management table is included in the document on page 14. One of the changes is a recommendation that when the hepatitis B surface antigen (HBsAg) status of the source patient is unknown (for example, as might occur from a puncture wound from a needle in the trash), the exposed unvaccinated or incompletely vaccinated HCP should be managed as if the source patient were HBsAg positive. In these situations, the new recommendation is to include a dose of hepatitis B immune globulin (HBIG) in addition to starting or completing the vaccination series for all exposures where the HBsAg status of the source is unknown.

Zoster vaccine

A long-term care resident age 80 years who received zoster vaccine (Zostavax; Merck) several years ago recently had a mild case of shingles. Is there any recommendation for administering a second dose of vaccine in such a circumstance? Are booster doses ever recommended?

The answer to both questions is no. Zoster vaccine is not 100% effective. In the key clinical trial, overall effectiveness among people age 60 years and older was 51% and decreased with increasing age. However, the vaccine was 67% effective in preventing post-herpetic neuralgia; this effectiveness did not decrease with increasing age. The duration of protection from shingles after a dose of zoster vaccine is not known at this time. However, ACIP has not recommended a second dose for anyone. ACIP recommendations for the use of zoster vaccine are available at www.cdc.gov/mmwr/PDF/rr/rr5705.pdf.

The Zostavax package insert says to inject the vaccine into the deltoid region of the upper arm. We always give subcutaneous vaccines in the triceps area of the arm. Are we wrong?

No. The subcutaneous tissue overlying the triceps muscle of the upper arm is the usual location for subcutaneous vaccine injection for an adult.

The Zostavax package insert says that the vaccine is contraindicated in a person with a history of primary or acquired immunodeficiency states, leukemia, lymphoma, or other malignant neoplasms affecting the bone marrow or lymphatic system. Does this mean that a person who was treated for lymphoma many years ago and is now healthy should not receive zoster vaccine?

No. A person who was treated for leukemia, lymphoma, or other malignant cancers in the past and is now healthy and not receiving immunosuppressive treatment may receive zoster vaccine. However, a person who is immunosuppressed for any reason (disease or treatment) should not receive the vaccine.

Can a person age 60 years or older with a diagnosis of an autoimmune disease, such as lupus or rheumatoid arthritis, receive zoster vaccine?

Yes, with one qualification. A diagnosis of an autoimmune condition such as lupus or rheumatoid arthritis is not a contraindication to zoster vaccination. However, the treatment of these conditions may involve the use of an immunosuppressive drug, which could be a contraindication.

A 65-year-old patient is having major back surgery next week. He is requesting zoster vaccine today. Can I give him the vaccine?

Yes, with one qualification. There is no contraindication to vaccinating against zoster before surgery, unless the patient is immunocompromised for some reason.

For patients age 60 or older who don't remember having chickenpox in the past, should we test them for varicella immunity before giving zoster vaccine?

No. Simply vaccinate them with zoster vaccine according to the ACIP recommendations.

We weren't familiar with the recommendations and tested a 60-year-old for varicella antibody because she said she never had chickenpox. Her result was negative. Should this patient receive zoster vaccine or varicella vaccine?

In this situation, since you've tested the patient and the results were negative, the patient should receive varicella vaccine.

A person age 60 years or older who has no medical contraindications is eligible for zoster vaccine regardless of their memory of having had chickenpox. However, if an adult age 60 years or older is tested for varicella immunity for whatever reason, and the test is negative, he/she should be given 2 doses of varicella vaccine at least 4 weeks apart, not zoster vaccine. See www.cdc.gov/vaccines/vpd-vac/shingles/hcp-vaccination.htm for more information.

How should zoster vaccine be transported to an off-site clinic location?

Neither CDC nor the vaccine manufacturer recommends transporting varicella-containing vaccines. If these vaccines must be transported (for example, during an emergency), CDC recommends transport in a portable freezer unit that maintains the temperature between -58°F and +5°F (-50°C and -15°C). Portable freezers may be available for rent in some places. If varicella-containing vaccines must be transported and a portable freezer unit is not available, do not use dry ice. Dry ice may subject varicella-containing vaccines to temperatures colder than -58°F (-50°C).

Varicella-containing vaccines may be transported at refrigerator temperature between 36°F and 46°F (2°C and 8°C) for up to 72 continuous hours prior to reconstitution. Vaccine stored between 36°F and 46°F (2°C and 8°C) that is not used within 72 hours of removal from a freezer should be discarded. Detailed instructions for the transport of varicella-containing vaccines at refrigerator temperature are available in the CDC "Vaccine Storage & Handling Toolkit" at www.cdc.gov/vaccines/recs/storage/toolkit/storage-handling-toolkit.pdf.

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