

NEEDLE TIPS

from the Immunization Action Coalition — www.immunize.org

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Suspect Measles; Vaccinate Against Measles

The U.S. is currently seeing the largest number of measles cases in 15 years, with 156 confirmed cases reported between January 1 and June 17, 2011. Most of these cases—136—were associated with importations from measles-endemic countries or countries where large outbreaks are occurring, primarily countries in Europe, Africa, and Asia. Health departments across the U.S. have issued press releases announcing measles cases. To access some of these releases, go to www.immunize.org/newreleases/state-local.asp.

Easily transmitted through the air, the measles virus is highly contagious: Following exposure, more than 90 percent of susceptible people develop measles. Given how contagious measles is, it is imperative that healthcare professionals recognize measles in healthcare settings and isolate patients with suspected measles from other patients.

Suspect measles

Because measles cases are occurring all across the U.S., you must maintain a high index of suspicion for this disease. A succinct summary of the signs and symptoms of measles appears in the Ask the Experts section below and continues on [page 22](#). To view a collection of photos of people with measles, visit IAC's website at www.immunize.org/photos/measles-photos.asp.

Isolate patients with suspected measles: Your front desk staff, appointment scheduler, and office nurse are your practice's first line of defense in identifying patients who might be infected with measles. When scheduling a visit for a patient with a rash illness, make sure the scheduler either refers the caller to the office nurse, or is him- or herself well trained to ask appropriate questions so that a patient who might have measles is not allowed to enter the practice through the main waiting area where other patients potentially would be exposed. Ideally, any patient suspected of having measles should enter through a separate entrance and should be isolated from all other patients in a private room with the door closed. Do not use this patient's exam room for ANY patients for at least two hours after the suspected measles patient has left.

Follow infection control guidance: If you suspect your patient might have measles, contact your local health department while the patient is still in your office to determine the next steps for clinical evaluation, testing, and follow-up.

For helpful guidance on infection control in your healthcare setting, see the online document from the California Department of Public Health

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Ask the Experts

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

Please provide some details about the measles cases we're experiencing across the United States.

We are currently seeing an increased number of measles importations into the U.S. due to recent

increases in measles cases in countries commonly visited by U.S. travelers (e.g., France, India). During 2001–08, a median of 56 measles cases were reported to CDC each year. By contrast, during the first 19 weeks of 2011, 23 states reported 118 cases. Of the 118 cases, 89% were associated with importation from other countries.

Of the 118 cases, 47 (40%) resulted in hospitalization. All but one hospitalized patient were unvaccinated. The vaccinated patient reported having received 1 dose of measles-containing vaccine and was hospitalized for observation only.

Measles-mumps-rubella (MMR) vaccine is safe and highly effective in preventing measles and its complications. Maintaining high immunization rates with MMR vaccine is the cornerstone of outbreak prevention.

How serious is measles?

Measles can lead to serious complications and death, even with modern medical care. The 1989–91 measles outbreak in the U.S. resulted in over 55,000 cases and more than 100 deaths. The current outbreak in France has resulted in 10,000 cases during the first four months of 2011, including 12 cases of encephalitis, 360 cases of severe measles pneumonia, and 6 measles-related deaths. Of the 118 cases reported in the U.S. in the first

19 weeks of 2011, 40% had to be hospitalized and nine had pneumonia.

What are the signs and symptoms healthcare providers should look for in diagnosing measles?

Healthcare providers should suspect measles in patients with a febrile rash illness and the clinically compatible symptoms of cough, coryza (runny nose), and/or conjunctivitis (red, watery eyes). A clinical case of measles is defined as an illness characterized by

- a generalized rash lasting 3 or more days, and

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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)

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

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Immunization Action Coalition

Immunization Action Coalition (IAC) Launches Major Redesign of Its Flagship Website — www.immunize.org

Whether you're a newcomer or a frequent visitor to IAC's website for healthcare professionals, www.immunize.org, it's an exciting time to stop by for a visit. The newly designed website offers you a deeper and broader experience through improved design and navigation, making it faster and easier for you to find the essential information you want and have come to expect from IAC. To see the improvements we've made, please visit www.immunize.org today.

NEW NAVIGATION FEATURES

Drop-down Menus

The new drop-down navigation feature, which is located near the top of every page, gives you quick access to IAC's materials and resources. The drop-down feature comprises six major sections on www.immunize.org: (1) **Handouts for Patients & Staff**, (2) **Clinic Resources**, (3) **Vaccine Information Statements**, (4) **Diseases & Vaccines**, (5) **Talking about Vaccines**, and (6) **Topics**.

Central Feature Box

With its changing visual images, the Central Feature Box on IAC's new home page is the place to go to find frequently updated content. In addition to IAC's welcome message, the central box gives you access to these website sections: **Needle Tips & More** (IAC's publications: *Needle Tips*, *Vaccinate Adults*, and *IAC Express*), **What's New at IAC**, **Immunization News**, **Featured Resources**, and **Shop IAC**.

Most Popular Web Sections and Downloads

Right below the Central Feature Box, you'll find links to this month's top 15 web sections, as well as to the top 10 downloaded handouts for patients and staff.

Guide to www.immunize.org

At the bottom of the new home page, you will find an abbreviated alphabetical listing of IAC's web sections and materials.

NEW SECTIONS AND FEATURES

Clinic Resources

IAC's drop-down menu **Clinic Resources** provides access to a treasure trove of valuable links and materials for vaccinators, new and old.



www.immunize.org

A to Z Index

At the very top of each page, you'll find this handy alphabetical listing. It provides direct links to the majority of IAC's web sections and resources.

News & Information

If you want to stay current on news and activities pertaining to U.S. immunization, be sure to check out the **News & Information** section; sources include the federal government, professional societies, international organizations, and specialized and mainstream media. You can access it from the Central Feature Box.

Featured Resources

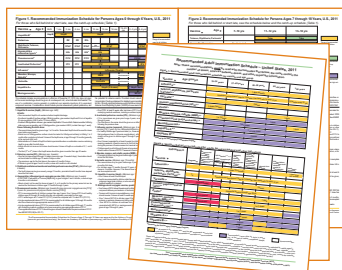
Featured Resources is an ongoing and frequently updated listing of noteworthy immunization resources from our immunization partners. You can access it from the Central Feature Box.

We hope you'll have a chance to explore the redesigned www.immunize.org. If you are interested in providing feedback about the new home page, please complete our survey at www.surveymonkey.com/s/SX5RMD6

DISCLAIMER: *Needle Tips* is available to all readers free of charge. Some of the information in this issue is supplied to us by the Centers for Disease Control and Prevention in Atlanta, Georgia, and some information is supplied by third-party sources. The Immunization Action Coalition (IAC) has used its best efforts to accurately publish all of this information, but IAC cannot guarantee that the original information as supplied by others is correct or complete, or that it has been accurately published. Some of the information in this issue is created or compiled by IAC. All of the information in this issue is of a time-critical nature, and we cannot guarantee that some of the information is not now outdated, inaccurate, or incomplete. IAC cannot guarantee that reliance on the information in this issue will cause no injury. Before you rely on the information in this issue, you should first independently verify its current accuracy and completeness. IAC is not licensed to practice medicine or pharmacology, and the providing of the information in this issue does not constitute such practice. Any claim against IAC must be submitted to binding arbitration under the auspices of the American Arbitration Association in Saint Paul, Minnesota.

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

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



To order, visit www.immunize.org/shop, or use the order form on page 23.

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

**New
DVD!**

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



The California Department of Public Health, Immunization Branch, updated its award-winning training video, "Immunization Techniques: Best Practices with Infants, Children, and Adults." The 25-minute DVD can be used to train new employees and to refresh the skills of experienced staff on administering injectable, oral, and nasal-spray vaccines to children, teens, and adults. Make sure your healthcare setting has the new 2010 edition!

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

To order, visit www.immunize.org/shop, or use the order form on page 23.

For 100 or more copies, contact us for discount pricing: admininfo@immunize.org

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

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.

Buy 1 box (250 cards) for \$45 (first order of a 250-card box comes with a 30-day, money-back guarantee). Discounts for larger orders: 2 boxes \$40 each; 3 boxes \$37.50 each; 4 boxes \$34.50 each

To order, visit www.immunize.org/shop, or use the order form on page 23.

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

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Vaccine Highlights

Recommendations, schedules, and more

Editor's note: The information in Vaccine Highlights is current as of July 25, 2011.

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 3 times a year in Atlanta; meetings are open to the public. The next meetings will be held on Oct. 25–26, 2011, and Feb. 22–23, 2012. For more information, including details about registration procedures, visit www.cdc.gov/vaccines/recs/acip.

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

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

Tdap news

On June 22, ACIP voted to recommend that pregnant women who have not previously been vaccinated against pertussis receive pertussis-containing vaccine late in the second trimester or at any time during the third trimester of pregnancy. The goal of vaccinating pregnant women is to protect their newborns from contracting pertussis in infancy. Votes of approval by ACIP become official CDC recommendations once they are signed off on by the director of CDC and the Secretary of Health and Human Services and are published in *MMWR*.

On July 8, FDA approved an expanded age indication for Boostrix tetanus-diphtheria-acellular pertussis vaccine (Tdap; GSK) to include use in adults age 65 years and older. Previously, Boostrix had been approved for use in people age 10–64 years. To read the package insert, go to www.fda.gov/downloads/BiologicsBloodVaccines/UCM152842.pdf.

Measles news

On June 22, CDC issued a Health Advisory stating that from January 1 through June 17, 2011, CDC received reports of 156 confirmed cases of measles. This is the highest reported number since 1996. Of these, 136 cases were linked to importations from countries where measles is

endemic or where large outbreaks are occurring. To access the CDC Health Advisory, go to <http://emergency.cdc.gov/HAN/han00323.asp>.

In response to continuing measles outbreaks, IAC has posted links to public health alerts and press releases from many health departments across the nation. To access these documents from IAC's State & Local Public Health Departments web page, go to www.immunize.org/newreleases/state-local.asp.

Meningococcal vaccine news

On April 24, FDA expanded vaccine licensure for Menactra meningococcal conjugate vaccine (MCV4; sanofi pasteur) to include infants and toddlers age 9 through 23 months. Previously, Menactra had been licensed for use in people age 2 through 55 years. To access the package insert, go to www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM131170.pdf.

HPV vaccine news

On May 3, CDC published new editions of the VISs for the two human papillomavirus (HPV) vaccines, Gardasil and Cervarix. CDC/ACIP recommendations for use of HPV vaccine have not changed. To access the new VIS for Gardasil, go to www.immunize.org/vis/vis-hpv-gardasil.pdf. To access the new VIS for Cervarix, go to www.immunize.org/vis/vis-hpv-cervarix.pdf.

Influenza vaccine news

On May 9, FDA approved Fluzone Intradermal (sanofi pasteur), an influenza vaccine for use in adults age 18 through 64 years. The vaccine, which is administered using an ultra-fine needle 0.06-inch in length, uses one-fifth the usual amount of antigen. To read the approval letter, go to www.fda.gov/BiologicsBloodVaccines/Vaccines/ApprovedProducts/ucm255160.htm.

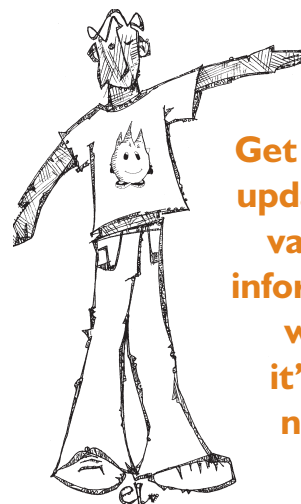
Fluzone Intradermal will be supplied as a single-dose, preservative-free, prefilled syringe. The product will be available to healthcare providers in the U.S. for the 2011–12 influenza season.

JE vaccine news

On May 27, CDC published "Recommendations for Use of a Booster Dose of Inactivated Vero Cell Culture-Derived Japanese Encephalitis Vaccine." It states that if the primary 2-dose series of inactivated Vero cell culture-derived Japanese encephalitis (JE) vaccine (Ixiaro, Novartis) was

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administered more than year previously, a booster dose may be given before potential JE virus exposure. The primary series is 2 doses administered 28 days apart. Ixiaro is recommended for certain U.S. travelers and laboratory personnel age 17 years and older for prevention of disease caused by JE virus. To obtain a copy of the recommendations, see pages 661–663 of this document: www.cdc.gov/mmwr/PDF/wk/mm6020.pdf.

Also on May 27, CDC published updated information on options for obtaining Japanese encephalitis (JE) vaccine for children. Vero cell culture-derived JE vaccine (Ixiaro; Novartis) is the only JE vaccine currently approved for U.S. use. It is intended for adults age 17 years and older. It will likely be several years before Ixiaro is licensed in the U.S. for use in children. Current options for obtaining JE vaccine for U.S. children include (1) enroll children in the ongoing clinical trial, (2) administer Ixiaro off-label, or (3) receive JE vaccine at an international travelers' health clinic in Asia. To obtain this update, see pages 664–665 of this document: www.cdc.gov/mmwr/PDF/wk/mm6020.pdf.

(continued on next page)

Adenovirus vaccine news

On March 16, FDA approved Adenovirus Type 4 and Type 7 Vaccine, Live, Oral (Teva Pharmaceuticals USA) for use in military personnel age 17 through 50 years for prevention of febrile acute respiratory disease (ARD) caused by Adenovirus Type 4 and Type 7. To access the package insert, go to www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM247515.pdf.

On July 14, CDC issued a VIS for adenovirus vaccine. To access the VIS, go to www.immunize.org/vis/vis_adenovirus.pdf.

CDC news

In April, CDC published the twelfth edition of the Pink Book (formally titled *Epidemiology and Prevention of Vaccine-Preventable Diseases*). To download and order it, go to www.cdc.gov/vaccines/pubs/pinkbook. The cost of a soft-cover edition is \$35 plus shipping and handling. The Pink Book is also available in e-reader format on Amazon.com, Google eBooks, and Barnes & Noble.

CDC recently made the 2012 edition of the Yellow Book (formally titled *CDC Health Information for International Travel*) available online and in print. To access the online and print versions, go to wwwnc.cdc.gov/travel/page/yellowbook-2012-home.htm. Single-copy cost is approximately \$45.

CDC's invaluable course "Epidemiology and Prevention of Vaccine-Preventable Diseases 2011" is available in DVD format and as a ten-module web-on-demand series. To access the web-on-demand version, go to: www.cdc.gov/vaccines/ed/epivac. To order one free copy of the DVD, locate item #22-0771 on this form: wwwnc.cdc.gov/pubs/NCIRD.aspx.

In April, CDC posted a Spanish-language version of the Recommended Immunization Schedules for Persons Aged 0 Through 18 Years—U.S., 2011. To access it, go to www.cdc.gov/vaccines/recs/schedules/downloads/child/0-18yrs-and-catchup-spanish.pdf.

On May 13, CDC published "Summary of Notifiable Diseases—U.S., 2009." It contains the official statistics, in tabular and graphic form, for the reported occurrence of nationally notifiable infectious diseases in the U.S. To access it, go to www.cdc.gov/mmwr/PDF/wk/mm5853.pdf.

Vaccine safety news

A supplement to the May 2011 issue of *Pediatrics* (a journal of the American Academy of Pediatrics) contains 18 articles on vaccine safety written

by medical experts. Access to all articles is available at no charge at http://pediatrics.aappublications.org/content/vol127/Supplement_1.

Current VISs and dates

The use of most Vaccine Information Statements (VISs) is mandated by federal law. Listed below are the dates of the most current VISs. Check your stock of VISs against this list. If you have outdated VISs, print current ones from IAC's website at www.immunize.org/vis. You'll find VISs in more than 30 languages.

DTaP/DT/DTP	5/17/07	MMRV	5/21/10
Hepatitis A	3/21/06	PCV	4/16/10
Hepatitis B	7/18/07	PPSV	10/6/09
Hib	12/16/98	Polio	1/1/00
HPV (Cervarix)	5/3/11	Rabies	10/6/09
HPV (Gardasil)	5/3/11	Rotavirus	12/6/10
Influenza (LAIV)	8/10/10	Shingles	10/6/09
Influenza (TIV)	8/10/10	Td/Tdap	11/18/08
Japan. enceph.	3/1/10	Typhoid	5/19/04
Meningococcal	1/28/08	Varicella	3/13/08
MMR	3/13/08	Yellow fever	3/30/11

Multi-vaccine VIS9/18/08
(for 6 vaccines given to infants/children:
DTaP, IPV, Hib, HepB, PCV, RV)

Suspect Measles; Vaccinate Against Measles (cont. from page 1)

(CDPH) titled [Healthcare Facility Infection Control Recommendations for Suspect Measles Patients](#).

Additional practical resources on measles are found on [pages 18–19](#) of this issue of *Needle Tips*. Visit the CDPH website at www.cdph.ca.gov/HealthInfo/discond/Pages/Measles.aspx for many more useful measles-related materials.

Vaccinate against measles

Make sure all healthcare personnel in your work setting who were born in 1957 or later have had two doses of MMR vaccine, according to CDC recommendations.

Vaccinate your patients with MMR vaccine. You can vaccinate pediatric patients at any visit, not just at well-child visits. Several Q&As in the Ask the Experts section on [page 22](#) address vaccinating patients of all ages, including those who are planning international travel, have been exposed to measles, live in communities where measles is present, or work in healthcare settings.

Measles is serious and highly contagious. It is vital that as healthcare professionals we take the lead in protecting our patients, coworkers, and communities from infection.

IAC welcomes Dr. Sharon Humiston as associate director for research

Sharon G. Humiston, MD, MPH, FAAP, recently joined IAC as associate director for research. A board-certified pediatrician, Dr. Humiston is also professor of pediatrics, University of Missouri-Kansas City, and a health services researcher and clinician in the Division of Emergency and Urgent Care, Children's Mercy Hospitals and Clinics, Kansas City.



Sharon G. Humiston,
MD, MPH, FAAP

During the past 20 years, Dr. Humiston has held faculty appointments in emergency medicine and pediatrics at the University of Rochester School of Medicine and Dentistry, Rochester, NY. From 1997 to 2000, Sharon served as a medical officer in the Training and Education Branch, National Immunization Program, CDC. From 2005 to 2009, she was a member of the National Vaccine Advisory Committee, serving as chair of the Subcommittee on Communication and Public Engagement. She is a Fellow of the American Academy of Pediatrics.

Early in her career, Dr. Humiston wrote the first Vaccine Information Statements based on

the 11-page pamphlets that had been distributed for each vaccine. Since then, she has authored more than 70 journal articles and reports, and has contributed ten chapters to scholarly medical textbooks. Her research interests include immunization outreach, adolescent immunization, school-located vaccination, and web-based immunization education for providers. She has been involved in approximately 30 research projects that have received funding from CDC and other government agencies. Some of her research projects have examined vaccine risk-benefit communication, emergency department vaccination, immunization coverage, and immunization outreach. Sharon reviews manuscripts for *Pediatrics*, *Archives of Pediatrics & Adolescent Medicine*, *Academic Pediatrics*, and *Journal of the National Medical Association*.

The mother of two children, one of whom is diagnosed with autism, Sharon is an immunization expert for Parents of Kids with Infectious Diseases (PKIDs), and a member of the Scientific Advisory Board, Autism Science Foundation.

We have added Sharon to IAC's staff web page at: www.immunize.org/aboutus/iacstaff.asp.

Summary of Recommendations for Child/Teen Immunization (Ages birth through 18 years) (Page 1 of 4)

Vaccine name and route	Schedule for routine vaccination and other guidelines (any vaccine can be given with another)	Schedule for catch-up vaccination and related issues	Contraindications and precautions (mild illness is not a contraindication)
Hepatitis B (HepB) <i>Give IM</i>	- Vaccinate all children age 0 through 18yrs. - Vaccinate all newborns with monovalent vaccine prior to hospital discharge. Give dose #2 at age 1–2m and the final dose at age 6–18m (the last dose in the infant series should not be given earlier than age 24wks). After the birth dose, the series may be completed using 2 doses of single-antigen vaccine or up to 3 doses of Comvax (ages 2m, 4m, 12–15m) or Pediarix (ages 2m, 4m, 6m), which may result in giving a total of 4 doses of hepatitis B vaccine. If mother is HBsAg-positive: give the newborn HBIG + dose #1 within 12hrs of birth; complete series at age 6m or, if using Comvax, at age 12–15m. If mother's HBsAg status is unknown: give the newborn dose #1 within 12hrs of birth. If low birth weight (less than 2000 grams), also give HBIG within 12hrs. If the mother is subsequently found to be HBsAg positive, give the infant HBIG ASAP and within 7d of birth and follow HepB immunization schedule for infants born to HBsAg-positive mothers.	- Do not restart series, no matter how long since previous dose. 3-dose series can be started at any age. - Minimum intervals between doses: 4wks between #1 and #2, 8wks between #2 and #3, and at least 16wks between #1 and #3 (e.g., 0-, 2-, 4m; 0-, 1-, 4m). Special Notes on Hepatitis B Vaccine (HepB) Dosing of HepB: Monovalent vaccine brands are interchangeable. For people age 0 through 19yrs, give 0.5 mL of either Engerix-B or Recombivax HB. Alternative dosing schedule for unvaccinated adolescents age 11 through 15yrs: Give 2 doses Recombivax HB 1.0 mL (adult formulation) spaced 4–6m apart. (Engerix-B is not licensed for a 2-dose schedule.) For preterm infants: Consult ACIP hepatitis B recommendations (<i>MMWR</i> 2005; 54 [RR-16]).*	Contraindication Previous anaphylaxis to this vaccine or to any of its components. Precaution Moderate or severe acute illness.
DTaP, DT (Diphtheria, tetanus, acellular pertussis) <i>Give IM</i>	- Give to children at ages 2m, 4m, 6m, 15–18m, 4–6yrs. - May give dose #1 as early as age 6wks. - May give #4 as early as age 12m if 6m have elapsed since #3. - Do not give DTaP/DT to children age 7yrs and older. - If possible, use the same DTaP product for all doses.	#2 and #3 may be given 4wks after previous dose. #4 may be given 6m after #3. - If #4 is given before 4th birthday, wait at least 6m for #5 (age 4–6yrs). - If #4 is given after 4th birthday, #5 is not needed.	Contraindications - Previous anaphylaxis to this vaccine or to any of its components. - For DTaP/Tdap only: encephalopathy not attributable to an identifiable cause, within 7d after DTP/DTaP. Precautions - Moderate or severe acute illness. - History of arthus reaction following a prior dose of tetanus-toxoid-containing vaccine. - Guillain-Barré syndrome (GBS) within 6wks after previous dose of tetanus-toxoid-containing vaccine. - For DTaP only: Any of these events following a previous dose of DTP/DTaP: 1) temperature of 105°F (40.5°C) or higher within 48hrs; 2) continuous crying for 3hrs or more within 48hrs; 3) collapse or shock-like state within 48hrs; 4) seizure within 3d. - For DTaP/Tdap only: Progressive or unstable neurologic disorder, uncontrolled seizures, or progressive encephalopathy. Note: Tdap may be given to pregnant women at the provider's discretion.
Td, Tdap (Tetanus, diphtheria, acellular pertussis) <i>Give IM</i>	- Give Tdap to all children and teens age 11–18yrs (starting at age 11–12yrs) who have not received previous Tdap; then boost every 10yrs with Td. - Tdap should be given regardless of interval since previous Td. - Make special efforts to give Tdap to children and teens who are 1) in contact with infants younger than age 12m and 2) healthcare workers with direct patient contact. - In pregnancy, when indicated, give Td or Tdap in 2nd or 3rd trimester. If not administered during pregnancy, give Tdap in immediate postpartum period (if not previously vaccinated).	Children as young as age 7yrs and teens who are unvaccinated or behind schedule should complete a primary Td series (spaced at 0, 1–2m, and 6–12m intervals); substitute a 1-time Tdap for any dose in the series, preferably as dose #1.	
Polio (IPV) <i>Give SC or IM</i>	- Give to children at ages 2m, 4m, 6–18m, 4–6yrs. - May give dose #1 as early as age 6wks. - Not routinely recommended for U.S. residents age 18yrs and older (except certain travelers).	- The final dose should be given on or after the 4th birthday and at least 6m from the previous dose. - If dose #3 is given after 4th birthday, dose #4 is not needed if dose #3 is given at least 6m after dose #2.	Contraindication Previous anaphylaxis to this vaccine or to any of its components. Precautions - Moderate or severe acute illness. - Pregnancy.

*This document was adapted from the recommendations of the Advisory Committee on Immunization Practices (ACIP). To obtain copies of the recommendations, call the CDC-INFO Contact Center at (800) 232-4636; visit CDC's website at www.cdc.gov/vaccines/pubs/ACIP-list.htm; or visit the

Immunization Action Coalition (IAC) website at www.immunize.org/acip. This table is revised periodically. Visit IAC's website at www.immunize.org/childrules to make sure you have the most current version.

Summary of Recommendations for Child/Teen Immunization (Ages birth through 18 years)

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Vaccine name and route	Schedule for routine vaccination and other guidelines (any vaccine can be given with another)	Schedule for catch-up vaccination and related issues	Contraindications and precautions (mild illness is not a contraindication)
Influenza Trivalent inactivated influenza vaccine (TIV) <i>Give IM</i> Live attenuated influenza vaccine (LAIV) <i>Give intranasally</i>	• Vaccinate all children and teens age 6m through 18yrs. • LAIV may be given to healthy, non-pregnant people age 2–49yrs. • Give 2 doses to first-time vaccinees age 6m through 8yrs, spaced 4wks apart. • For TIV, give 0.25 mL dose to children age 6–35m and 0.5 mL dose if age 3yrs and older. • If LAIV and either MMR, Var, and/or yellow fever vaccine are not given on the same day, space them at least 28d apart.		Contraindications • Previous anaphylaxis to this vaccine, to any of its components, or to eggs. • For LAIV only: age younger than 2yrs; pregnancy; chronic pulmonary (including asthma), cardiovascular (except hypertension), renal, hepatic, neurological/neuromuscular, hematologic, or metabolic (including diabetes) disorders; immunosuppression (including that caused by medications or HIV); for children and teens ages 6m through 18yrs, current long-term aspirin therapy; for children age 2 through 4yrs, wheezing or asthma within the past 12m, per healthcare provider statement. Precautions • Moderate or severe acute illness. • History of Guillain-Barré syndrome (GBS) within 6wks of a previous influenza vaccination. • For LAIV only: Receipt of specific antivirals (i.e., amantadine, rimantadine, zanamivir, or oseltamivir) 48hrs before vaccination. Avoid use of these antiviral drugs for 14d after vaccination.
Varicella (Var) (Chickenpox) <i>Give SC</i>	• Give dose #1 at age 12–15m. • Give dose #2 at age 4–6yrs. Dose #2 of Var or MMRV may be given earlier if at least 3m since dose #1. • Give a 2nd dose to all older children and adolescents with history of only 1 dose. • MMRV may be used in children age 12m through 12yrs (see note below). Note: For the first dose of MMR and varicella given at age 12–47mos, either MMR and Var or MMRV may be used. Unless the parent or caregiver expresses a preference for MMRV, CDC recommends that MMR and Var should be given for the first dose in this age group.	• If younger than age 13yrs, space dose #1 and #2 at least 3m apart. If age 13yrs or older, space at least 4wks apart. • May use as postexposure prophylaxis if given within 5d. • If Var and either MMR, LAIV, and/or yellow fever vaccine are not given on the same day, space them at least 28d apart.	Contraindications • Previous anaphylaxis to this vaccine or to any of its components. • Pregnancy or possibility of pregnancy within 4wks. • Children on high-dose immunosuppressive therapy or who are immunocompromised because of malignancy and primary or acquired cellular immunodeficiency, including HIV/AIDS (although vaccination may be considered if CD4+ T-lymphocyte percentages are either 15% or greater in children ages 1 through 8yrs or 200 cells/μL or greater in children age 9yrs and older). Precautions • Moderate or severe acute illness. • If blood, plasma, and/or immune globulin (IG or VZIG) were given in past 11m, see ACIP statement General Recommendations on Immunization* regarding time to wait before vaccinating. • Receipt of specific antivirals (i.e., acyclovir, famciclovir, or valacyclovir) 24hrs before vaccination, if possible; delay resumption of these antiviral drugs for 14d after vaccination. • For MMRV only, personal or family (i.e., sibling or parent) history of seizures. Note: For patients with humoral immunodeficiency or leukemia, see ACIP recommendations *.
MMR (Measles, mumps, rubella) <i>Give SC</i>	Note: For the first dose of MMR and varicella given at age 12–47mos, either MMR and Var or MMRV may be used. Unless the parent or caregiver expresses a preference for MMRV, CDC recommends that MMR and Var should be given for the first dose in this age group. • Give dose #1 at age 12–15m. • Give dose #2 at age 4–6yrs. Dose #2 may be given earlier if at least 4wks since dose #1. For MMRV: dose #2 may be given earlier if at least 3m since dose #1. • Give a 2nd dose to all older children and teens with history of only 1 dose. • MMRV may be used in children age 12m through 12yrs (see note above).	• If MMR and either Var, LAIV, and/or yellow fever vaccine are not given on the same day, space them at least 28d apart. • When using MMR for both doses, minimum interval is 4wks. • When using MMRV for both doses, minimum interval is 3m. • Within 72hrs of measles exposure, give 1 dose of MMR as postexposure prophylaxis to susceptible healthy children age 12m and older.	Contraindications • Previous anaphylaxis to this vaccine or to any of its components. • Pregnancy or possibility of pregnancy within 4wks. • Severe immunodeficiency (e.g., hematologic and solid tumors; receiving chemotherapy; congenital immunodeficiency; long-term immunosuppressive therapy, or severely symptomatic HIV). Note: HIV infection is NOT a contraindication to MMR for children who are not severely immunocompromised (consult ACIP MMR recommendations [MMWR 1998;47 [RR-8] for details*). Precautions • Moderate or severe acute illness. • If blood, plasma, or immune globulin given in past 11m, see ACIP statement General Recommendations on Immunization* regarding time to wait before vaccinating. • History of thrombocytopenia or thrombocytopenic purpura. • For MMRV only, personal or family (i.e., sibling or parent) history of seizures. • Need for tuberculin skin testing (TST). If TST needed, give TST before or on same day as MMR, or give TST 4wks following MMR.

Summary of Recommendations for Child/Teen Immunization (Ages birth through 18 years)

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Vaccine name and route	Schedule for routine vaccination and other guidelines (any vaccine can be given with another)	Schedule for catch-up vaccination and related issues	Contraindications and precautions (mild illness is not a contraindication)
Hib <i>(Haemophilus influenzae type b)</i> <i>Give IM</i>	• ActHib (PRP-T): give at age 2m, 4m, 6m, 12–15m (booster dose). • PedvaxHIB or Comvax (containing PRP-OMP): give at age 2m, 4m, 12–15m (booster dose). • Dose #1 of Hib vaccine should not be given earlier than age 6wks. • The last dose (booster dose) is given no earlier than age 12m and a minimum of 8wks after the previous dose. • Hib vaccines are interchangeable; however, if different brands of Hib vaccines are administered for dose #1 and dose #2, a total of 3 doses are necessary to complete the primary series in infants. • Any Hib vaccine may be used for the booster dose. • Hib is not routinely given to children age 5yrs and older. • Hiberix is approved ONLY for the booster dose at age 15m through 4yrs.	All Hib vaccines: • If #1 was given at 12–14m, give booster in 8wks. • Give only 1 dose to unvaccinated children ages 15 through 59m. ActHib: • #2 and #3 may be given 4wks after previous dose. • If #1 was given at age 7–11m, only 3 doses are needed; #2 is given 4–8wks after #1, then boost at age 12–15m (wait at least 8wks after dose #2). PedvaxHIB and Comvax: • #2 may be given 4wks after dose #1.	Contraindications • Previous anaphylaxis to this vaccine or to any of its components. • Age younger than 6wks. Precaution Moderate or severe acute illness.
Pneumococcal conjugate (PCV13) <i>Give IM</i>	As soon as feasible, replace existing stock of PCV7 with PCV13. • Give at ages 2m, 4m, 6m, 12–15m. • Dose #1 may be given as early as age 6wks. • When children are behind on PCV schedule, minimum interval for doses given to children younger than age 12m is 4wks; for doses given at 12m and older, it is 8wks. • Give 1 dose to unvaccinated healthy children age 24–59m. • For high-risk** children ages 24–71m: Give 2 doses at least 8wks apart if they previously received fewer than 3 doses; give 1 dose at least 8wks after the most recent dose if they previously received 3 doses. • PCV13 is not routinely given to healthy children age 5yrs and older. **High-risk: Those with sickle cell disease; anatomic or functional asplenia; chronic cardiac, pulmonary, or renal disease; diabetes; cerebrospinal fluid leaks; HIV infection; immunosuppression; diseases associated with immunosuppressive and/or radiation therapy; or who have or will have a cochlear implant.	• For minimum intervals, see 3rd bullet at left. • For age 7–11m: If history of 0 doses, give 2 doses of PCV13, 8wks apart, with a 3rd dose at age 12–15m; if history of 1 or 2 doses, give 1 dose of PCV13 with a 2nd dose at age 12–15m, at least 8wks later. • For age 12–23m: If unvaccinated or history of 1 dose before age 12m, give 2 doses of PCV13 8wks apart; if history of 1 dose at or after age 12m or 2 or 3 doses before age 12m, give 1 dose of PCV13 at least 8wks after most recent dose; if history of 4 doses of PCV7 or other age-appropriate complete PCV7 schedule, give 1 supplemental dose of PCV13 at least 8wks after the most recent dose. • For age 24–59m and healthy: If unvaccinated or any incomplete schedule or if 4 doses of PCV7 or any other age-appropriate complete PCV7 schedule, give 1 supplemental dose of PCV13 at least 8wks after the most recent dose. • For age 24–71m and at high risk**: If unvaccinated or any incomplete schedule of 1 or 2 doses, give 2 doses of PCV13, 1 at least 8wks after the most recent dose and another dose at least 8wks later; if any incomplete series of 3 doses, or if 4 doses of PCV7 or any other age-appropriate complete PCV7 schedule, give 1 supplemental dose of PCV13 at least 8wks after the most recent PCV7 dose. • For children ages 6 through 18yrs with functional or anatomic asplenia (including sickle cell disease), HIV infection or other immunocompromising condition, cochlear implant, or CSF leak, consider giving 1 dose of PCV13 regardless of previous history of PCV7 or PPSV.	Contraindication Previous anaphylaxis to a PCV vaccine, to any of its components, or to any diphtheria toxoid-containing vaccine. Precaution Moderate or severe acute illness.
Pneumococcal polysaccharide (PPSV) <i>Give IM or SC</i>	• Give 1 dose at least 8wks after final dose of PCV to high-risk children age 2yrs and older. • For children who have an immunocompromising condition or have sickle cell disease or functional or anatomic asplenia, give a 2nd dose of PPSV 5yrs after previous PPSV (consult ACIP PPSV recommendations at www.cdc.gov/vaccines/pubs/ACIP-list.htm).		Contraindication Previous anaphylaxis to this vaccine or to any of its components. Precaution Moderate or severe acute illness.

Summary of Recommendations for Child/Teen Immunization (Ages birth through 18 years)

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Vaccine name and route	Schedule for routine vaccination and other guidelines (any vaccine can be given with another)	Schedule for catch-up vaccination and related issues	Contraindications and precautions (mild illness is not a contraindication)
Rotavirus (RV) <i>Give orally</i>	• Rotarix (RV1): give at age 2m, 4m. • RotaTeq (RV5): give at age 2m, 4m, 6m. • May give dose #1 as early as age 6wks. • Give final dose no later than age 8m 0 days.	• Do not begin series in infants older than age 14wks 6 days. • Intervals between doses may be as short as 4wks. • If prior vaccination included use of different or unknown brand(s), a total of 3 doses should be given.	Contraindications • Previous anaphylaxis to this vaccine or to any of its components. If allergy to latex, use RV5. • Diagnosis of severe combined immunodeficiency (SCID). Precautions • Moderate or severe acute illness. • Altered immunocompetence other than SCID. • Chronic gastrointestinal disease. • History of intussusception. • Spina bifida or bladder exstrophy.
Hepatitis A (HepA) <i>Give IM</i>	• Give 2 doses spaced 6m apart to all children at age 1yr (12–23m). • Vaccinate all previously unvaccinated children and adolescents age 2yrs and older who - Want to be protected from HAV infection. - Live in areas where vaccination programs target older children. - Travel anywhere except U.S., W. Europe, N. Zealand, Australia, Canada, or Japan. - Have chronic liver disease, clotting factor disorder, or are adolescent males who have sex with other males. - Are users of illicit drugs (injectable or non-injectable). - Anticipate close personal contact with an international adoptee from a country of high or intermediate endemicity during the first 60 days following the adoptee's arrival in the U.S.	• Minimum interval between doses is 6m. • Children who are not fully vaccinated by age 2yrs can be vaccinated at subsequent visits. • Consider routine vaccination of children age 2yrs and older in areas with no existing program. • Give 1 dose as postexposure prophylaxis to incompletely vaccinated children age 12m and older who have recently (during the past 2wks) been exposed to hepatitis A virus.	Contraindication Previous anaphylaxis to this vaccine or to any of its components. Precautions • Moderate or severe acute illness. • Pregnancy.
Meningococcal conjugate, quadrivalent (MCV4) <i>Give IM</i> Meningococcal polysaccharide (MPSV4) <i>Give SC</i>	• Give MCV4 #1 routinely at age 11 through 12yrs and a booster dose at age 16yrs. • Give MCV4 to all unvaccinated teens ages 13 through 18yrs; if vaccinated at age 13–15yrs, give booster dose at age 16–18yrs. • Give 1 initial dose to unvaccinated <i>incoming</i> college students ages 19–21yrs; give booster dose to incoming students who received the most recent dose when younger than age 16yrs. Consider same vaccination strategy for <i>existing</i> college students ages 19–21yrs. • Vaccinate all children age 2yrs and older who have any of the following risk factors: - Anatomic or functional asplenia, or persistent complement component deficiency; give 2 doses, separated by 8wks. - Travel to or reside in countries in which meningococcal disease is hyper-endemic or epidemic (e.g., the “meningitis belt” of Sub-Saharan Africa). Note: Use MPSV4 ONLY if there is a permanent contraindication or precaution to MCV4.	• If previously vaccinated with MPSV4 or MCV4 and risk of meningococcal disease persists, revaccinate with MCV4 in 3yrs (if first dose given at age 2 through 6yrs) or in 5yrs (if previous dose given at age 7yrs or older). Then, give additional booster doses every 5yrs if risk continues. • When administering MCV4 to children with HIV infection, give 2 initial doses, separated by 8wks.	Contraindication Previous anaphylaxis to this vaccine or to any of its components. Precautions • Moderate or severe acute illness.
Human papillomavirus (HPV) (HPV2, Cervarix) (HPV4, Gardasil) <i>Give IM</i>	• Give 3-dose series to girls at age 11–12yrs on a 0, 1–2, 6m schedule. (May be given as early as age 9yrs.) • Give a 3-dose series to all older girls and women (through age 26yrs) who were not previously vaccinated. • Consider giving HPV4 to males age 9 through 26yrs to reduce their likelihood of acquiring genital warts.	Minimum intervals between doses: 4wks between #1 and #2; 12 wks between #2 and #3. Overall, there must be at least 24wks between doses #1 and #3. If possible, use the same vaccine product for all doses.	Contraindication Previous anaphylaxis to this vaccine or to any of its components. Precautions • Moderate or severe acute illness. • Pregnancy.

Summary of Recommendations for Adult Immunization (Age 19 years & older)

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Vaccine name and route	For whom vaccination is recommended	Schedule for vaccine administration (any vaccine can be given with another)	Contraindications and precautions (mild illness is not a contraindication)
Influenza Trivalent inactivated influenza vaccine (TIV) <i>Give IM</i> Live attenuated influenza vaccine (LAIV) <i>Give intranasally</i>	For people through age 18 years, consult “Summary of Recommendations for Child/Teen Immunization” at www.immunize.org/catg.d/p2010.pdf . - Beginning with the 2010–11 influenza season, vaccination is recommended for all adults. (This includes healthy adults ages 19–49yrs without risk factors.) - LAIV is only approved for healthy nonpregnant people age 2–49yrs. - Adults ages 65yrs and older may be given standard-dose TIV or, alternatively, a high-dose TIV. Note: LAIV may not be given to some adults; see contraindications and precautions listed in far right column.	- Give 1 dose every year in the fall or winter. - Begin vaccination services as soon as vaccine is available and continue until the supply is depleted. - Continue to give vaccine to unvaccinated adults throughout the influenza season (including when influenza activity is present in the community) and at other times when the risk of influenza exists. - If 2 or more of the following live virus vaccines are to be given—LAIV, MMR, Var, and/or yellow fever—they should be given on the same day. If they are not, space them by at least 28d.	Contraindications - Previous anaphylactic reaction to this vaccine, to any of its components, or to eggs. - For LAIV only: pregnancy; chronic pulmonary (including asthma), cardiovascular (except hypertension), renal, hepatic, neurological/neuromuscular, hematologic, or metabolic (including diabetes) disorders; immunosuppression (including that caused by medications or HIV). Precautions - Moderate or severe acute illness. - History of Guillain-Barré syndrome (GBS) within 6wks following previous influenza vaccination. - For LAIV only: receipt of specific antivirals (i.e., amantadine, rimantadine, zanamivir, or oseltamivir) 48hrs before vaccination. Avoid use of these antiviral drugs for 14d after vaccination.
Pneumococcal polysaccharide (PPSV) <i>Give IM or SC</i>	For people through age 18 years, consult “Summary of Recommendations for Child/Teen Immunization” at www.immunize.org/catg.d/p2010.pdf . - People age 65yrs and older. - People younger than age 65yrs who have chronic illness or other risk factors, including chronic cardiac or pulmonary disease (including asthma), chronic liver disease, alcoholism, diabetes, CSF leaks, cigarette smoking, as well as candidates for or recipients of cochlear implants and people living in special environments or social settings (including American Indian/Alaska Natives age 50 through 64yrs if recommended by local public health authorities). - Those at highest risk of fatal pneumococcal infection, including people who - Have anatomic or functional asplenia, including sickle cell disease. - Have an immunocompromising condition, including HIV infection, leukemia, lymphoma, Hodgkin’s disease, multiple myeloma, generalized malignancy, chronic renal failure, or nephrotic syndrome. - Are receiving immunosuppressive chemotherapy (including corticosteroids). - Have received an organ or bone marrow transplant.	- Give 1 dose if unvaccinated or if previous vaccination history is unknown. - Give a 1-time revaccination to people - Age 65yrs and older if 1st dose was given prior to age 65yrs and 5yrs have elapsed since dose #1. - Age 19 through 64yrs who are at highest risk of fatal pneumococcal infection or rapid antibody loss (see the 3rd bullet in the box to left for listings of people at highest risk) and 5yrs have elapsed since dose #1.	Contraindication Previous anaphylactic reaction to this vaccine or to any of its components. Precaution Moderate or severe acute illness.

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Summary of Recommendations for Adult Immunization (Age 19 years & older)

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Vaccine name and route	For whom vaccination is recommended	Schedule for vaccine administration (any vaccine can be given with another)	Contraindications and precautions (mild illness is not a contraindication)
MMR (Measles, mumps, rubella) <i>Give SC</i>	For people through age 18 years, consult “Summary of Recommendations for Child/Teen Immunization” at www.immunize.org/catg.d/p2010.pdf. • People born in 1957 or later (especially those born outside the U.S.) should receive at least 1 dose of MMR if there is no laboratory evidence of immunity or documentation of a dose given on or after the first birthday. • People in high-risk groups, such as healthcare personnel (paid, unpaid, or volunteer), students entering college and other post-high school educational institutions, and international travelers, should receive a total of 2 doses. • People born before 1957 are usually considered immune, but evidence of immunity (serology or documented history of 2 doses of MMR) should be considered for healthcare personnel. • Women of childbearing age who do not have acceptable evidence of rubella immunity or vaccination.	• Give 1 or 2 doses (see criteria in 1st and 2nd bullets in box to left). • If dose #2 is recommended, give it no sooner than 4wks after dose #1. • If a pregnant woman is found to be rubella susceptible, give 1 dose of MMR postpartum. • If 2 or more of the following live virus vaccines are to be given—LAIV, MMR, Var, Zos, and/or yellow fever—they should be given on the same day. If they are not, space them by at least 28d. • Within 72hrs of measles exposure, give 1 dose as postexposure prophylaxis to susceptible adults. Note: Routine post-vaccination serologic testing is not recommended.	Contraindications • Previous anaphylactic reaction to this vaccine or to any of its components. • Pregnancy or possibility of pregnancy within 4wks. • Severe immunodeficiency (e.g., hematologic and solid tumors; receiving chemotherapy; congenital immunodeficiency; long-term immunosuppressive therapy; or severely symptomatic HIV). Note: HIV infection is NOT a contraindication to MMR for those who are not severely immunocompromised (i.e., CD4+ T-lymphocyte counts are greater than or equal to 200 cells/μL). Precautions • Moderate or severe acute illness. • If blood, plasma, and/or immune globulin were given in past 11m, see ACIP statement General Recommendations on Immunization* regarding time to wait before vaccinating. • History of thrombocytopenia or thrombocytopenic purpura. Note: If TST (tuberculosis skin test) and MMR are both needed but not given on same day, delay TST for 4–6wks after MMR.
Varicella (chickenpox) (Var) <i>Give SC</i>	For people through age 18 years, consult “Summary of Recommendations for Child/Teen Immunization” at www.immunize.org/catg.d/p2010.pdf. • All adults without evidence of immunity. Note: Evidence of immunity is defined as written documentation of 2 doses of varicella vaccine; a history of varicella disease or herpes zoster (shingles) based on healthcare-provider diagnosis; laboratory evidence of immunity; and/or birth in the U.S. before 1980, with the exceptions that follow. - Healthcare personnel (HCP) born in the U.S. before 1980 who do not meet any of the criteria above should be tested or given the 2-dose vaccine series. If testing indicates they are not immune, give the 1st dose of varicella vaccine immediately. Give the 2nd dose 4–8 wks later. - Pregnant women born in the U.S. before 1980 who do not meet any of the criteria above should either 1) be tested for susceptibility during pregnancy and if found susceptible, given the 1st dose of varicella vaccine postpartum before hospital discharge, or 2) not be tested for susceptibility and given the 1st dose of varicella vaccine postpartum before hospital discharge. Give the 2nd dose 4–8wks later.	• Give 2 doses. • Dose #2 is given 4–8wks after dose #1. • If dose #2 is delayed, do not repeat dose #1. Just give dose #2. • If 2 or more of the following live virus vaccines are to be given—LAIV, MMR, Var, Zos, and/or yellow fever—they should be given on the same day. If they are not, space them by at least 28d. • May use as postexposure prophylaxis if given within 5d. Note: Routine post-vaccination serologic testing is not recommended.	Contraindications • Previous anaphylactic reaction to this vaccine or to any of its components. • Pregnancy or possibility of pregnancy within 4wks. • Persons on high-dose immunosuppressive therapy or who are immunocompromised because of malignancy and primary or acquired cellular immunodeficiency, including HIV/AIDS (although vaccination may be considered if CD4+ T-lymphocyte counts are greater than or equal to 200 cells/μL. See MMWR 2007;56,RR-4). Precautions • Moderate or severe acute illness. • If blood, plasma, and/or immune globulin (IG or VZIG) were given in past 11m, see ACIP statement General Recommendations on Immunization* regarding time to wait before vaccinating. • Receipt of specific antivirals (i.e., acyclovir, famciclovir, or valacyclovir) 24hrs before vaccination, if possible; delay resumption of these antiviral drugs for 14d after vaccination.
Zoster (shingles) (Zos) <i>Give SC</i>	• People age 60yrs and older.	• Give 1-time dose if unvaccinated, regardless of previous history of herpes zoster (shingles) or chickenpox. • If 2 or more of the following live virus vaccines are to be given—MMR, Zos, and/or yellow fever—they should be given on the same day. If they are not, space them by at least 28d.	Contraindications • Previous anaphylactic reaction to any component of zoster vaccine. • Primary cellular or acquired immunodeficiency. • Pregnancy. Precautions • Moderate or severe acute illness. • Receipt of specific antivirals (i.e., acyclovir, famciclovir, or valacyclovir) 24hrs before vaccination, if possible; delay resumption of these antiviral drugs for 14d after vaccination.

Summary of Recommendations for Adult Immunization (Age 19 years & older)

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Vaccine name and route	For whom vaccination is recommended	Schedule for vaccine administration (any vaccine can be given with another)	Contraindications and precautions (mild illness is not a contraindication)
Td, Tdap (Tetanus, diphtheria, pertussis) <i>Give IM</i> Using tetanus toxoid (TT) instead of Tdap or Td is not recommended.	For people through age 18 years, consult “Summary of Recommendations for Child/Teen Immunization” at www.immunize.org/catg.d/p2010.pdf. • All people who lack written documentation of a primary series consisting of at least 3 doses of tetanus- and diphtheria-toxoid-containing vaccine. • A booster dose of Td or Tdap may be needed for wound management, so consult ACIP recommendations.* • In pregnancy, when indicated, give Td or Tdap in 2nd or 3rd trimester. If not administered during pregnancy, give Tdap in immediate postpartum period. For Tdap only: • Adults younger than age 65yrs who have not already received Tdap. • Adults of any age, including adults age 65yrs and older, in contact with infants younger than age 12m (e.g., parents, grandparents, childcare providers) who have not received a dose of Tdap should be prioritized for vaccination. • Healthcare personnel of all ages. • Adults age 65yrs and older without a risk indicator (e.g., not in contact with an infant) may also be vaccinated with Tdap.	• For people who are unvaccinated or behind, complete the primary Td series (spaced at 0, 1–2m, 6–12m intervals); substitute a one-time dose of Tdap for one of the doses in the series, preferably the first. • Give Td booster every 10yrs after the primary series has been completed. • Tdap can be given regardless of interval since previous Td.	Contraindications • Previous anaphylactic reaction to this vaccine or to any of its components. • For Tdap only, history of encephalopathy, not attributable to an identifiable cause, within 7d following DTP/DTaP. Precautions • Moderate or severe acute illness. • Guillain-Barré syndrome within 6wks following previous dose of tetanus-toxoid-containing vaccine. • Progressive or unstable neurologic disorder, uncontrolled seizures, or progressive neuropathy. • History of arthus reaction following a prior dose of tetanus-toxoid-containing vaccine. Note: Tdap may be given to pregnant women at the provider’s discretion.
Hepatitis A (HepA) <i>Give IM</i> Brands may be used interchangeably.	For people through age 18 years, consult “Summary of Recommendations for Child/Teen Immunization” at www.immunize.org/catg.d/p2010.pdf. • All people who want to be protected from hepatitis A virus (HAV) infection. • People who travel or work anywhere EXCEPT the U.S., Western Europe, New Zealand, Australia, Canada, and Japan. • People with chronic liver disease; injecting and non-injecting drug users; men who have sex with men; people who receive clotting-factor concentrates; people who work with HAV in experimental lab settings; food handlers when health authorities or private employers determine vaccination to be appropriate. • People who anticipate close personal contact with an international adoptee from a country of high or intermediate endemicity during the first 60 days following the adoptee’s arrival in the U.S. • Adults age 40yrs or younger with recent (within 2 wks) exposure to HAV. For people older than age 40yrs with recent (within 2 wks) exposure to HAV, immune globulin is preferred over HepA vaccine.	• Give 2 doses. • The minimum interval between doses #1 and #2 is 6m. • If dose #2 is delayed, do not repeat dose #1. Just give dose #2. For Twinrix (hepatitis A and B combination vaccine [GSK]) for patients age 18yrs and older only: give 3 doses on a 0, 1, 6m schedule. There must be at least 4wks between doses #1 and #2, and at least 5m between doses #2 and #3. An alternative schedule can also be used at 0, 7d, 21–30d, and a booster at 12m.	Contraindication Previous anaphylactic reaction to this vaccine or to any of its components. Precautions • Moderate or severe acute illness. • Safety during pregnancy has not been determined, so benefits must be weighed against potential risk.
Hepatitis B (HepB) <i>Give IM</i> Brands may be used interchangeably.	For people through age 18 years, consult “Summary of Recommendations for Child/Teen Immunization” at www.immunize.org/catg.d/p2010.pdf. • All adults who want to be protected from hepatitis B virus infection. • Household contacts and sex partners of HBsAg-positive people; injecting drug users; sexually active people not in a long-term, mutually monogamous relationship; men who have sex with men; people with HIV; persons seeking STD evaluation or treatment; hemodialysis patients and those with renal disease that may result in dialysis; healthcare personnel and public safety workers who are exposed to blood; clients and staff of institutions for the developmentally disabled; inmates of long-term correctional facilities; certain international travelers; and people with chronic liver disease. Note: Provide serologic screening for immigrants from endemic areas. If patient is chronically infected, assure appropriate disease management. For sex partners and household contacts of HBsAg-positive people, provide serologic screening and administer initial dose of HepB vaccine at same visit.	Give 3 doses on a 0, 1, 6m schedule. • Alternative timing options for vaccination include 0, 2, 4m; 0, 1, 4m; and 0, 1, 2, 12m (Engerix brand only). • There must be at least 4wks between doses #1 and #2, and at least 8wks between doses #2 and #3. Overall, there must be at least 16wks between doses #1 and #3. • Schedule for those who have fallen behind: If the series is delayed between doses, DO NOT start the series over. Continue from where you left off.	Contraindication Previous anaphylactic reaction to this vaccine or to any of its components. Precaution Moderate or severe acute illness.

Summary of Recommendations for Adult Immunization (Age 19 years & older)

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Vaccine name and route	For whom vaccination is recommended	Schedule for vaccine administration (any vaccine can be given with another)	Contraindications and precautions (mild illness is not a contraindication)
Human papillomavirus (HPV) (HPV2, Cervarix) (HPV4, Gardasil) <i>Give IM</i>	For people through age 18 years, consult “Summary of Recommendations for Child/Teen Immunization” at www.immunize.org/catg.d/p2010.pdf . • All previously unvaccinated women through age 26yrs. • Consider giving HPV4 to men through age 26yrs to reduce their likelihood of acquiring genital warts.	• Give 3 doses on a 0, 2, 6m schedule. • There must be at least 4wks between doses #1 and #2 and at least 12wks between doses #2 and #3. Overall, there must be at least 24wks between doses #1 and #3. If possible, use the same vaccine product for all three doses.	Contraindication Previous anaphylactic reaction to this vaccine or to any of its components. Precautions • Moderate or severe acute illness. • Data on vaccination in pregnancy are limited. Vaccination should be delayed until after completion of the pregnancy.
Meningococcal conjugate vaccine, quadrivalent (MCV4) Menactra, Menveo <i>Give IM</i> Meningococcal polysaccharide vaccine (MPSV4) Menomune <i>Give SC</i>	For people through age 18 years, consult “Summary of Recommendations for Child/Teen Immunization” at www.immunize.org/catg.d/p2010.pdf . • People with anatomic or functional asplenia or persistent complement component deficiency. • People who travel to or reside in countries in which meningococcal disease is hyperendemic or epidemic (e.g., the “meningitis belt” of Sub-Saharan Africa). • Microbiologists routinely exposed to isolates of <i>N. meningitidis</i>. • Incoming and current college students ages 19 through 21 may require vaccination; see 5th bullet in the box to the right for details.	• Give 2 initial doses of MCV4 separated by 2m to adults 55yrs and younger with risk factors listed in 1st bullet in column to left or if vaccinating adults in this age group with HIV infection. Give 1 dose of MPSV4 to adults 56yrs and older with risk factors. • Give 1 initial dose to all other adults with risk factors (see 2nd–4th bullets in column to left). • Give booster doses every 5yrs to adults with continuing risk (see the 1st–3rd bullets in column to left for listings of people with possible continuing risk). • MCV4 is preferred over MPSV4 for people age 55yrs and younger; use MPSV4 ONLY if age 56yrs or older or if there is a permanent contraindication/precaution to MCV4. • Give 1 initial dose to <i>unvaccinated incoming</i> college students ages 19–21yrs; give booster dose to <i>incoming</i> students who received the most recent dose when younger than 16yrs. <i>Consider</i> same vaccination strategy for existing college students ages 19–21yrs.	Contraindication Previous anaphylactic reaction to this vaccine or to any of its components. Precautions • Moderate or severe acute illness.
Polio (IPV) <i>Give IM or SC</i>	For people through age 18 years, consult “Summary of Recommendations for Child/Teen Immunization” at www.immunize.org/catg.d/p2010.pdf . • Not routinely recommended for U.S. residents age 18yrs and older. Note: Adults living in the U.S. who never received or completed a primary series of polio vaccine need not be vaccinated unless they intend to travel to areas where exposure to wild-type virus is likely. Previously vaccinated adults can receive 1 booster dose if traveling to polio endemic areas or to areas where the risk of exposure is high.	• Refer to ACIP recommendations* regarding unique situations, schedules, and dosing information.	Contraindication Previous anaphylactic reaction to this vaccine or to any of its components. Precautions • Moderate or severe acute illness. • Pregnancy.

After the Shots...

Your child may need extra love and care after getting vaccinated. Some vaccinations that protect children from serious diseases also can cause discomfort for a while. Here are answers to questions many parents have after their children have been vaccinated. If this sheet doesn't answer your questions, call your healthcare provider.

Vaccinations may hurt a little... but disease can hurt a lot!

Call your healthcare provider right away if you answer "yes" to any of the following questions:

- ☐ Does your child have a temperature that your healthcare provider has told you to be concerned about?
- ☐ Is your child pale or limp?
- ☐ Has your child been crying for more than 3 hours and just won't quit?
- ☐ Is your child's body shaking, twitching, or jerking?
- ☐ Is your child very noticeably less active or responsive?

What to do if your child has discomfort

I think my child has a fever. What should I do?

Check your child's temperature to find out if there is a fever. An easy way to do this is by taking a temperature in the armpit using an electronic thermometer (or by using the method of temperature-taking your healthcare provider recommends). If your child has a temperature that your healthcare provider has told you to be concerned about or if you have questions, call your healthcare provider.

Here are some things you can do to help reduce fever:

- Give your child plenty to drink.
- Dress your child lightly. Do not cover or wrap your child tightly.
- Give your child a fever- or pain-reducing medicine such as acetaminophen (e.g., Tylenol) or ibuprofen (e.g., Advil, Motrin). The dose you give your child should be based on your child's weight and your healthcare provider's instructions. *Do not give aspirin.* Recheck your child's temperature after 1 hour. Call your healthcare provider if you have questions.

My child has been fussy since getting vaccinated. What should I do?

After vaccination, children may be fussy because of pain or fever. To reduce discomfort, you may want to give your child a medicine such as acetaminophen or ibuprofen. *Do not give aspirin.* If your child is fussy for more than 24 hours, call your healthcare provider.

My child's leg or arm is swollen, hot, and red. What should I do?

- Apply a clean, cool, wet washcloth over the sore area for comfort.
- For pain, give a medicine such as acetaminophen or ibuprofen, according to your healthcare provider's instructions (see box below). *Do not give aspirin.*
- If the redness or tenderness increases after 24 hours, call your healthcare provider.

My child seems really sick. Should I call my healthcare provider?

If you are worried **at all** about how your child looks or feels, call your healthcare provider!

HEALTHCARE PROVIDER: PLEASE FILL IN THE INFORMATION BELOW.

If your child's temperature is _____°F or _____°C or higher, or if you have questions, call your healthcare provider.

Healthcare provider phone number: _____

Reliable Sources of Immunization Information: Where to go to find answers!

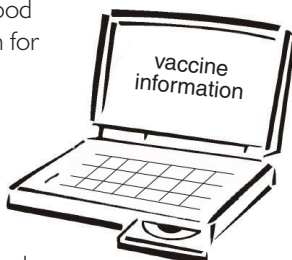
Websites

American Academy of Pediatrics (AAP)

www.aap.org/immunization AAP's childhood immunization website contains information for both parents and clinicians.

Centers for Disease Control and Prevention (CDC)

www.cdc.gov/vaccines The information on this website ranges from official vaccine recommendations for healthcare professionals to information for the general public about vaccines.



Every Child by Two (ECBT) www.ecbt.org and www.vaccinateyourbaby.org ECBT, founded by Rosalynn Carter and Betty Bumpers, has created these two websites. Each contains a broad array of educational materials and information about vaccines, their safety, vaccine research and science, vaccine misperceptions, and many other topics to help clinicians and parents.

Immunization Action Coalition (IAC)

www.immunize.org and www.vaccineinformation.org IAC is a nonprofit organization that promotes immunization for all people against vaccine-preventable diseases. These websites offer educational materials, photos, and video clips for parents, healthcare professionals, the media, and the general public.

National Network for Immunization Information (NNii)

www.immunizationinfo.org NNii provides current, science-based, extensively reviewed information to healthcare professionals, the media, policy makers, and the public.

U.S. Dept of Health and Human Services (HHS)

www.vaccines.gov Vaccines.gov is the federal gateway to information on vaccines and immunizations for infants, children, teenagers, adults, and seniors.

Vaccine Education Center (VEC)

www.vaccine.chop.edu The goal of the VEC at Children's Hospital of Philadelphia is to accurately communicate the facts about each childhood vaccine. VEC publishes a monthly vaccine e-newsletter for parents titled "Parents PACK." For more information or to subscribe, visit www.vaccine.chop.edu/parents

Phone Numbers

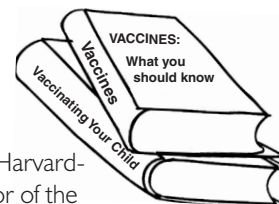
CDC-INFO Contact Center

A toll-free number for consumers and healthcare professionals who have questions about immunization and vaccine-preventable diseases. Call (800) CDC-INFO or (800) 232-4636. The Center operates 24/7 in English & Spanish. TTY: (888) 232-6348.

Books for Parents

Baby 411, 4th edition

By Denise Fields and Ari Brown, MD, Windsor Peak Press, 2009. Written by a Harvard-trained pediatrician (Brown) and the author of the best-selling *Baby Bargains* (Fields), this book is the ultimate compilation of frequently asked questions for baby's first year. It includes a special section on vaccines. To purchase, visit your local bookstore or www.windsorpeak.com/baby411



Do Vaccines Cause That?! A Guide for Evaluating Vaccine Safety, 1st edition

By Martin Myers, MD, and Diego Pineda, MS. Published by Immunizations for Public Health, 2008. Get straight, science-based answers to parents' questions about the safety of vaccines. To purchase, visit your local bookstore or www.dovaccinescausetthat.com

Parents Guide to Childhood Immunization, 2010

This 68-page booklet from CDC introduces parents to 14 childhood diseases and the 10 vaccines that can protect children from them. Parents can order a free booklet or print their own copy by visiting www.cdc.gov/vaccines/pubs/parents-guide

Plain Talk About Childhood Immunization, 6th edition

Washington State Department of Health, et al., 2008. This 54-page booklet provides parents with accurate information about immunizations and the diseases they prevent, vaccine safety, and other topics of interest to the public. The publication, available in English and Spanish, can be downloaded at <http://here.doh.wa.gov/materials/plain-talk-about-childhood-immunizations> in either low resolution (for printing on office copiers) or high resolution (for professional printing).

Vaccines and Your Child, Separating Fact from Fiction, 2011

By Paul Offit, MD, and Charlotte Moser, Columbia University Press, 2011. This book answers questions about the science and safety of modern vaccines. In straightforward prose, Offit and Moser explain how vaccines work, how they are made, and how they are tested. Most important, they separate the real risks of vaccines from feared but unfounded risks. To purchase, visit your local bookstore or www.cup.columbia.edu

Videos

"Vaccines and Your Baby" and "Vaccines: Separating Fact from Fear"

Available for a nominal charge in English and Spanish in DVD format, these videos answer many questions that new parents have. Ordering information is available at www.chop.edu/service/vaccine-education-center/familyOrder.cfm or parents can watch the videos online at www.chop.edu/service/vaccine-education-center/related-information/multimedia.html.



Need help responding to vaccine-hesitant parents?

Science-based materials are available from these respected organizations

American Academy of Pediatrics (AAP)

Healthcare providers can find numerous resources on the AAP's website to help with parents and caregivers who have questions about vaccinating their child at www.aap.org/immunization/families/deciding.html, including:

- "Why immunize?" www.aap.org/immunization/families/whyimmunize.html
- "Are Vaccines Safe?" www.aap.org/immunization/families/safety.html
- "Evaluating Web Information" www.aap.org/immunization/families/evaluatingwebinfo.html
- "Misconceptions and Frequently Asked Questions" www.aap.org/immunization/families/faq.html
- When parents cannot be convinced, consider using AAP's Refusal to Vaccinate form at www.aap.org/immunization/pediatricians/pdf/Refusaltovaccinate.pdf.

California Immunization Coalition

The California Immunization Coalition (CIC) has developed several excellent provider pieces that discuss common questions many parents may have regarding vaccines for their children. These include

- "Responding to Parents' Top 10 Concerns" www.immunizeca.org/wp-content/uploads/2010/12/IMM-917_web.pdf
- "Talking with Parents About Vaccine Safety" www.immunizeca.org/wp-content/uploads/2010/12/IMM-915_web.pdf
- "Alternative Vaccine Schedules: Helping Parents Separate Fact From Fear" www.immunizeca.org/wp-content/uploads/2010/12/IMM-988.pdf

Centers for Disease Control and Prevention (CDC)

Among CDC's many online immunization resources is the "Parent's Guide to Childhood Immunization," a 64-page booklet that can be ordered or printed at www.cdc.gov/vaccines/pubs/parents-guide.

Other CDC materials, designed to help healthcare providers work with hesitant parents, include the following:

- "If you choose not to vaccinate your child, understand the risks and responsibilities" www.cdc.gov/vaccines/spec-grps/hcp/conv-materials.htm#understand
- "Parents who question vaccines" www.cdc.gov/vaccines/spec-grps/parents.htm#question
- "Common questions parents ask about infant immunizations" www.cdc.gov/vaccines/spec-grps/infants/parent-questions.htm
- "Talking with parents about vaccines for infants" www.cdc.gov/vaccines/spec-grps/hcp/conv-materials.htm#talkpvi

Every Child by Two (ECBT)

Created by Every Child by Two, www.vaccinateyourbaby.org focuses on answering parents' commonly asked questions about vaccines. It features video clips and links to current vaccine news stories.

Immunization Action Coalition (IAC)

IAC's Talking about Vaccines web section provides healthcare professionals with top vaccination resources from trusted sources such as CDC, AAP, IAC, VEC, and many more. Visit www.immunize.org/concerns. IAC has developed several patient handouts for vaccine-hesitant parents. These include:

- "Clear Answers & Smart Advice About Your Baby's Shots," an excerpt from the popular book "Baby 411" by Dr. Ari Brown www.immunize.org/catg.d/p2068.pdf
- "Reliable Sources of Immunization Information: Where to go to find answers!" www.immunize.org/catg.d/p4012.pdf
- "Vaccines Work!" www.immunize.org/catg.d/p4037.pdf

Institute for Vaccine Safety, Johns Hopkins University

The Institute for Vaccine Safety collects vaccine-specific safety information. Of particular interest is its "Components of Vaccines" section, which contains tables specifying the contents of various vaccines: www.vaccinesafety.edu/components.htm.

Vaccine Education Center (VEC)

Children's Hospital of Philadelphia

- Tear sheets—offered in tear-off pads of 50, intended for physicians to hand out to patients. Useful titles for hesitant parents include "Aluminum in Vaccines," "The Facts About Childhood Vaccines," "Thimerosal," "Too Many Vaccines?" "Vaccine Ingredients," and "Vaccines and Autism."
- Videos—"Vaccines: Separating Fact from Fear" and "Vaccines and Your Baby" come in DVD format.

Materials can be viewed or printed at <http://vaccine.chop.edu/resources>. Tear-off pads and DVDs, as well as other VEC materials, can be ordered at nominal cost.

For parents with concerns about vaccines and autism

AAP has issued a statement that can be printed at www.aap.org/advocacy/releases/autismparentfacts.htm. Parents may wish to investigate further at www.aap.org/healthtopics/Autism.cfm. IAC also recommends these books:

- *Autism's False Prophets: Bad Science, Risky Medicine, and the Search for a Cure*, by Paul A. Offit, MD
- *Unstrange Minds: Remapping the World of Autism*, by Roy Richard Grinker, PhD

And, here are two well-researched handouts from IAC:

- "MMR Vaccine Does Not Cause Autism: Examine the Evidence!" www.immunize.org/catg.d/p4026.pdf
- "Evidence shows vaccines unrelated to autism" www.immunize.org/catg.d/p4028.pdf

Free and CDC-reviewed, they're ready for you to download, copy, and use!

Standing orders for child, teen, and adult vaccinations

Click blue text to view standing orders document

NEEDLE TIPS • July 2011 • Immunization Action Coalition • (651) 647-9009 • www.immunize.org • www.vaccineinformation.org 17

Fever and Rash?.....Consider Measles

Measles cases continue to be identified in California in returning international travelers. Measles is highly contagious. Please protect patients, visitors, and staff!

✓ **Keep an eye out for measles symptoms:**

Suspect measles in patients with:

- fever and rash
- history of international travel or contact with international visitors in the prior 3 weeks.

Note: A history of 2 doses of MMR vaccine does not exclude a measles diagnosis.

Prodrome

- Mild to moderate fever
- Cough
- Coryza
- Conjunctivitis

Rash onset

- Fever spikes, often as high as 104° to 105° F
- Red, maculopapular rash that may become confluent—typically starts at hairline, then face, and spreads rapidly down body
- Koplik's spots (tiny blue/white spots on the bright red background of the buccal mucosa) may be present



✓ **Act immediately if you suspect measles:**

- **Implement airborne infection control precautions immediately, mask and isolate patient—negative pressure room, if available.**
- **Permit only staff immune to measles to be near the patient.**
- **Notify your local health department immediately.**
- **Expedite measles serologic testing (IgM and IgG) at a public health lab; use of commercial labs may delay diagnosis.**
- **Safeguard other facilities: assure airborne infection control precautions before referring patients.**
- **Do not use any regular exam room for at least 2 hours after a suspected measles patient has left the room.**

VISITING ANOTHER COUNTRY? PROTECT YOUR FAMILY. **THINK MEASLES.**

Measles is widespread in places like Europe, Africa, Asia, India, and the Philippines.



BEFORE YOU TRAVEL

Tell your doctor where you are traveling. Babies and children may need measles protection at a younger age than usual.

AFTER YOU TRAVEL

Call your doctor if anyone gets a fever and rash within 3 weeks of returning from your trip. Describe where you traveled.

✈ Talk with your doctor if you are planning an international trip.

For more information go to www.cdc.gov/travel.

Checklist for Safe Vaccine Storage and Handling

Here are the most important things you can do to safeguard your vaccine supply. Are you doing them all? Review this list to see where you might make improvements in your vaccine management practices. Fill in each box with either **YES** or **NO**.

Establish Storage and Handling Policies

- ☐ YES ☐ NO 1. We have designated a primary vaccine coordinator and at least one back-up coordinator to be in charge of vaccine storage and handling at our facility.
- ☐ YES ☐ NO 2. Both the primary and back-up vaccine coordinator(s) have completely reviewed either CDC's online vaccine storage and handling guidance or equivalent training materials offered by our state health department's immunization program.
- ☐ YES ☐ NO 3. We have detailed, up-to-date, written policies for general vaccine management, including policies for routine activities and an emergency vaccine-retrieval-and-storage plan for power outages and other problems. Our policies are based on CDC's vaccine storage and handling guidance and/or on instruction from our state or local health department's immunization program.
- ☐ YES ☐ NO 4. We review these policies with all staff annually and with new staff, including temporary staff, when they are hired.

Log In New Vaccine Shipments

- ☐ YES ☐ NO 5. We maintain a vaccine inventory log that we use to document the following:
 - ☐ YES ☐ NO a. Vaccine name and number of doses received
 - ☐ YES ☐ NO b. Date we received the vaccine
 - ☐ YES ☐ NO c. Condition of vaccine when we received it
 - ☐ YES ☐ NO d. Vaccine manufacturer and lot number
 - ☐ YES ☐ NO e. Vaccine expiration date

Use Proper Storage Equipment

- ☐ YES ☐ NO 6. We store vaccines in refrigerator and freezer units designed specifically for storing biologics, including vaccines. Alternatively, we keep frozen and refrigerated vaccines in separate, free-standing freezer and refrigerator units. At a minimum, we use a household-style unit with a separate exterior door for the freezer and separate thermostats for the freezer and refrigerator. We do NOT use a dormitory-style unit (a small combination freezer-refrigerator unit with a freezer compartment inside the refrigerator).
- ☐ YES ☐ NO 7. We use only calibrated thermometers with a Certificate of Traceability and Calibration* that are recalibrated as recommended by the manufacturer.
- ☐ YES ☐ NO 8. We have planned back-up storage units(s) in the event of a power failure or other unforeseen event. We perform regular maintenance to assure optimal functioning.

Ensure Optimal Operation of Storage Units

- ☐ YES ☐ NO 9. We have a "Do Not Unplug" sign next to the electrical outlets for the refrigerator and freezer and a "Do Not Stop Power" warning label by the circuit breaker for the electrical outlets. Both include emergency contact information.
- ☐ YES ☐ NO 10. We keep the storage unit clean, dusting the coils and cleaning beneath it every 3–6 months.

Maintain Correct Temperatures

- ☐ YES ☐ NO 11. We always keep at least one accurate calibrated thermometer (+/-1°C [+/-2°F]) with the vaccines in the refrigerator; ideally, we have a continuous-temperature logger and/or temperature-sensitive alarm system.
- ☐ YES ☐ NO 12. We maintain the refrigerator temperature at 35–46°F (2–8°C), and we aim for 40°F (5°C).

(Maintain Correct Temperatures continued on page 2)

*Certificate of Traceability and Calibration with calibration measurements traceable to a testing laboratory accredited by the International Organization of Standardization, to the standards of the National Institute of Standards and Technology, or to another internationally recognized standards agency.

(Maintain Correct Temperatures continued from page 1)

- ☐ YES ☐ NO 13. We keep extra containers of water in the refrigerator (e.g., in the door, on the floor of the unit where the vegetable bins were located) to help maintain cool temperatures.
- ☐ YES ☐ NO 14. We always keep at least one accurate calibrated thermometer (+/-1°C [+/-2°F]) with vaccines in the freezer.
- ☐ YES ☐ NO 15. We maintain the average temperature in the freezer at +5°F (-15°C), preferably colder but no colder than -58°F (-50°C).
- ☐ YES ☐ NO 16. We keep ice packs or ice-filled containers in the freezer to help maintain cold temperatures.

Store Vaccines Correctly

- ☐ YES ☐ NO 17. We post signs on the doors of the refrigerator and freezer that indicate which vaccines should be stored in the refrigerator and which in the freezer.
- ☐ YES ☐ NO 18. We do NOT store any food or drink in any vaccine storage unit.
- ☐ YES ☐ NO 19. We store vaccines in the middle of the refrigerator or freezer (never in the doors), with room for air to circulate.
- ☐ YES ☐ NO 20. We have removed all vegetable and deli bins from the storage unit.
- ☐ YES ☐ NO 21. If we are using a combination refrigerator-freezer unit, we do not store vaccines in front of the cold air outlet that leads from the freezer to the refrigerator (often near the top shelf).
- ☐ YES ☐ NO 22. We check vaccine expiration dates and rotate our supply of each type of vaccine so that we use the vaccines that will expire soonest.
- ☐ YES ☐ NO 23. We store vaccines in their original packaging in clearly labeled uncovered containers with slotted sides that allow air to circulate.

Maintain Daily Temperature Logs

- ☐ YES ☐ NO 24. On days when our practice is open, we document refrigerator and freezer temperatures on the daily log twice a day — first thing in the morning and right before our facility closes.
- ☐ YES ☐ NO 25. We consistently record temperatures on the log in either Fahrenheit or Celsius. We NEVER mix in any way how we record our temperatures. For example, if the log prompts us to insert an "x" by the temperature that's preprinted on the log, we do not attempt to write in the actual temperature.
- ☐ YES ☐ NO 26. The logs show whom to call if the temperature in the storage unit goes out of range.
- ☐ YES ☐ NO 27. When we change the thermostat setting, we document it in the daily log sheet's note section.
- ☐ YES ☐ NO 28. If out-of-range temperatures occur in the unit, we document in the daily log sheet's note section who responded and when.
- ☐ YES ☐ NO 29. Trained staff (other than staff designated to record the temperatures) review the logs weekly.
- ☐ YES ☐ NO 30. We keep the temperature logs on file for at least 3 years.

Take Emergency Action As Needed

31. In the event that vaccines are exposed to improper storage conditions, we take the following steps:
- ☐ YES ☐ NO a. We restore proper storage conditions as quickly as possible; if necessary, we move the vaccine to our planned back-up storage unit. We address the storage unit's mechanical or electrical problems according to guidance from the manufacturer or repair service.
- ☐ YES ☐ NO b. In responding to improper storage conditions, we do NOT make frequent or large changes in thermostat settings. After changing the setting, we give the unit at least a day to stabilize its temperature.
- ☐ YES ☐ NO c. We temporarily label exposed vaccines "Do not use" and keep them separate from any unexposed vaccines. We do not use exposed vaccines until our state health department's immunization program or the vaccine manufacturer gives us approval.
- ☐ YES ☐ NO d. We document exactly what happened, noting the temperature in the storage unit and the amount of time the vaccines were out of proper storage conditions. We contact our state health department's immunization program or the vaccine manufacturer to determine how to handle the exposed vaccines.
- ☐ YES ☐ NO e. We follow the health department or manufacturer's instructions and keep a record detailing the event. Where applicable, we mark the exposed vials with a revised expiration date provided by the manufacturer.

If we answer ☐ YES to all of the above, we give ourselves a pat on the back! If not, we assign someone to implement needed changes!

IAC's
"Ask the
Experts"
team
from
CDC



Andrew T. Kroger, MD, MPH



Donna L. Weaver, RN, MN



William L. Atkinson, MD, MPH

- a temperature of 38.3°C or higher (101°F or higher), and
- cough, coryza, and/or conjunctivitis.

Koplik spots, a rash present on mucous membranes, are considered pathognomonic for measles. Koplik spots occur from 1–2 days before the measles rash appears to 1–2 days afterward. They appear as punctate blue-white spots on the bright red background of the buccal mucosa.

Providers should be especially aware of the possibility of measles in people with fever and rash who have recently traveled abroad or who have had contact with international travelers.

Providers should immediately isolate and report suspected measles cases to their local health department and obtain specimens for measles testing, including viral specimens for confirmation and genotyping. Providers should also collect blood for serologic testing during the first clinical encounter with a person who has suspected or probable measles.

How contagious is measles?

Measles is highly infectious. It is primarily transmitted from person to person via large respiratory droplets. Airborne transmission via aerosolized droplets has been documented in closed areas (e.g., office examination room) for up to 2 hours after a person with measles occupied the area.

Following exposure, more than 90% of susceptible people develop measles. The virus can be transmitted from 4 days before the rash becomes visible to 4 days after the rash appears.

How long does it take to show signs of measles after being exposed?

It takes an average of 10–12 days from exposure to the appearance of the first symptom, which is usually fever. The measles rash doesn't usually appear until approximately 14 days after exposure, 2–3 days after the fever begins.

Needle Tips correction policy

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

If a susceptible person is exposed to measles, can anything prevent them from developing the disease?

If the person has not been vaccinated, measles vaccine may prevent disease if given within 72 hours of exposure. Immune globulin (a blood product containing antibodies to the measles virus) may prevent or lessen the severity of measles if given within 6 days of exposure.

What are the recommendations for the use of MMR vaccine to prevent measles?

MMR vaccine is recommended routinely for all children at age 12–15 months, with a second dose at age 4–6 years. The second dose of MMR can be given as early as 4 weeks (28 days) after the first dose and be counted as a valid dose if both doses were given after the child's first birthday. The second dose is not a booster, but rather is intended to produce immunity in the small number of people who fail to respond to the first dose.

Adults with no evidence of immunity (defined as documented receipt of 1 dose [2 doses 4 weeks apart if high risk] of live measles virus-containing vaccine, laboratory evidence of immunity, documentation of physician-diagnosed measles, or birth before 1957) should get 1 dose of MMR unless the adult is in a high-risk group. High-risk people need 2 doses; they include healthcare personnel, international travelers, students at post-high school educational institutions, people exposed to measles in an outbreak setting, and those previously vaccinated with killed measles vaccine or with an unknown type of measles vaccine during 1963–1967.

Infants age 6–11 months should receive 1 dose of MMR vaccine before international travel. Any dose of MMR administered before the first birthday should not be counted as part of the 2-dose series, and should be repeated when the child is age 12–15 months.

We have measles cases in our community. How can I best protect the young children in my practice?

First of all, make sure all your patients are fully vaccinated according to the U.S. immunization schedule.

In certain circumstances, MMR is recommended for infants age 6–11 months. Give infants this age

a dose of MMR before international travel. In addition, consider measles vaccination for infants as young as age 6 months as a control measure during a U.S. measles outbreak. Consult your state health department to find out if this is recommended in your situation. Do not count any dose of MMR vaccine as part of the 2-dose series if it is administered before a child's first birthday. Instead, repeat the dose when the child is age 12 months.

In the case of a local outbreak, you also might consider vaccinating children age 12 months and older at the minimum age (12 months, instead of 12–15 months) and giving the second dose 4 weeks later (at the minimum interval) instead of waiting until age 4–6 years.

Finally, remember that infants too young for routine vaccination and people with medical conditions that contraindicate measles immunization depend on high MMR vaccination coverage among those around them. Be sure to encourage all your patients and their family members to get vaccinated if they are not immune.

My adult patient doesn't remember if he ever received MMR vaccine or had measles disease and is planning an international trip. How should I handle this situation?

You have the choice of testing for immunity or just giving 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 test indicates 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 the test result is indeterminate or equivocal, consider your patient nonimmune. ACIP does not recommend serologic testing after vaccination because commercial tests are not sensitive enough to detect vaccine-induced immunity reliably.

I'm a healthcare worker. How can I ensure I am protected against measles?

If you are a healthcare worker and you do not have acceptable evidence of immunity—documented receipt of 2 doses of live measles virus-containing vaccine at least 4 weeks apart or laboratory evidence of immunity—either get tested for immunity or get 2 doses of MMR at least 4 weeks apart. If you choose the testing route, and your result is negative, indeterminate, or equivocal, get 2 doses of MMR at least 4 weeks apart. ACIP does not recommend serologic testing after vaccination.

Can I give my patients measles vaccine instead of MMR?

No. Merck has not produced single-antigen measles, mumps, and rubella vaccines for the U.S. market since 2008. Even before that time, ACIP recommended the combined MMR vaccine whenever one or more of the individual antigens were indicated.

(continued on page 24)

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Does the increase in measles cases indicate that vaccination with MMR isn't effective?

No. Unvaccinated people accounted for 105 (89%) of the 118 cases. Among the 45 U.S. residents ages 12 months through 19 years who acquired measles, 39 (87%) were unvaccinated, including 24 whose parents claimed a religious or personal exemption and eight who missed opportunities for vaccination. Among the 42 U.S. residents age 20 years and older who acquired measles, 35 (83%) were unvaccinated, including six who declined vaccination because of personal objections to vaccination. Of the 33 U.S. residents who were vaccine-eligible and had traveled abroad, 30 were unvaccinated and one had received only 1 of the 2 recommended doses.

I understand that at its June 2011 meeting, ACIP voted to recommend Tdap vaccination for pregnant women. Can you tell me more about this?

Yes. ACIP voted that women's prenatal healthcare providers administer Tdap to pregnant women who have not previously received their one-time dose of Tdap. Healthcare providers should administer Tdap to these women, preferably during the third trimester or late in the second trimester (after 20 weeks gestation). Alternatively, Tdap can be administered immediately postpartum. This national strategy is aimed at preventing pertussis in infants too young to be immunized. Infants younger than age 6 months account for most pertussis-related hospitalizations and deaths.

We have a patient new to our office who at age 4 years received a dose of Pentacel (DTaP-IPV/Hib; sanofi) as the fifth DTaP/IPV dose that CDC recommends for children age 4–6 years. I know this use of Pentacel is not indicated on the manufacturer's package insert. Can we count the Pentacel dose our patient received as valid, or do we have to repeat the vaccinations?

You do not need to repeat the vaccinations. However, giving Pentacel as the fifth (booster) DTaP dose in children age 4–6 years is a medical error and should not be repeated in your practice. Pentacel is licensed for the first 4 doses in children age

6 weeks through 4 years (i.e., prior to the child's fifth birthday). For example, it would not have been an error if the dose had been the fourth DTaP dose given to this child. Pentacel should not be used for any dose in the series in children age 5 years or older or as the fifth dose in children age 4–6 years. However, the DTaP and IPV components of Pentacel can both be considered "valid" doses for completing the primary series of DTaP and IPV vaccines in children younger than age 5 years, provided the interval between the last 2 doses of IPV is at least 6 months. If the child age 4 years had not received a final dose of Hib vaccine, the Pentacel dose erroneously administered as the 4- to 6-year booster dose would be considered valid for completing the primary series of Hib vaccines.

Now that Menactra (MCV4; sanofi) is licensed for use in children as young as age 9 months, can you tell me which children should be vaccinated before their second birthday?

In April 2011, FDA expanded Menactra licensing to include children ages 9 through 23 months. At its June 2011 meeting, ACIP voted to recommend that (1) high-risk children age 9 through 23 months receive a 2-dose series of Menactra, with a 3-month interval between doses and (2) these doses routinely be given at ages 9 and 12 months.

ACIP defines high-risk children age 9 through 23 months as (1) those with complement component deficiencies, (2) those in a community or institution where a meningococcal disease outbreak is occurring, or (3) those traveling to an area of the world where meningococcal disease is epidemic. Children who need protection prior to international travel can receive the second dose as early as 2 months after the first dose. Age 2 years remains the minimum age for vaccinating children with asplenia or sickle cell disease with MCV4. Children who remain at increased risk for meningococcal disease should receive a booster dose 3 years after the primary 2-dose series.

I understand that in March 2011, FDA expanded the age indication for Zostavax (shingles vaccine; ZOS; Merck) to include the vaccine's use in people age 50 through 59 years (while retaining the age indication for use in people age 60 years and older). Can you tell me what ACIP recommends about this?

At its June 2011 meeting, the ACIP reviewed the current status of ZOS licensure and the burden of herpes zoster (HZ) disease. ACIP declined to vote to expand the recommendations for the use of ZOS to include people age 50 through 59 years for the following reasons: (1) vaccines that contain varicella virus (i.e., varicella, ZOS, and MMRV vaccines) are in recurrent short supply in the U.S., (2) though the burden of HZ disease increases after age 50, disease rates are lower in this age group than they are in the 60-years-and-older age group, (3) currently, ZOS vaccination rates are less than 10 percent, and (4) a recommendation to vaccinate people age 50–59 years could result in more zoster disease if the limited supply of vaccine were to be

given to people whose risk of disease is lower than that of older, more vulnerable adults.

Can pharmacists in all states administer Zostavax (ZOS)?

According to the American Pharmacist Association, 45 states currently allow pharmacists to administer ZOS, including many who administer it on a walk-in basis, using a protocol or standing orders. Not all pharmacists in the 45 states provide vaccination services, and of those who do, not all administer ZOS. It is best to call pharmacies ahead of time to find out if they have ZOS to administer to your patients.

We run a student health center and are wondering what the position is on discarding empty vaccine vials. Do they need to go in a sharps container after they are drawn up or can they go in the trash?

Empty or expired vaccine vials are considered medical waste and should be disposed of according to state regulations.

How can we expedite vaccination with Twinrix for international travelers?

Twinrix (combined HepA-HepB, GSK) is licensed for use in adults age 18 years and older on a schedule of 0, 1, and 6 months. If protection is needed sooner (e.g., for pending international travel), the vaccine can be given as 4 doses, on days 0, 7, and 21–30, followed by a booster dose at month 12.

Why is Merck now using gel packs instead of dry ice to ship its frozen vaccines (i.e., Varivax [varicella vaccine], MMRV, and Zostavax [shingles vaccine])?

Merck instituted this improved shipping practice in June 2011 to prevent its frozen vaccines from being exposed to temperatures lower than -58°F (-50°C) and the chance that the vial stopper would contract and possibly expose the vaccines to contamination.

CDC and the vaccine manufacturer do not recommend transporting varicella-containing vaccines to off-site clinics. If transport of frozen vaccine to off-site clinics is necessary, CDC recommends transport with a portable freezer unit that maintains the temperature between -58°F and +5°F (-50°C to -15°C). According to the manufacturer's product information, varicella-containing vaccines may be stored at refrigerator temperatures, between 35°F and 46°F (2°C to 8°C), for up to 72 continuous hours prior to reconstitution. If transporting frozen vaccine under refrigerated conditions, monitor and document the following EXPLICITLY:

- (1) the time refrigerator storage began
- (2) the total time the vaccine was held under refrigerator storage
- (3) the storage temperature at which the vaccine was kept during refrigerator storage

If any vaccine remains unused when the clinic is over, call the manufacturer immediately for guidance before discarding it.

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