Ask the Experts

IAC extends thanks to our experts, William L. Atkinson, MD, MPH, and Andrew T. Kroger, MD, MPH, medical epidemiologists at the National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention (CDC); and Joanna Buffington, MD, MPH, medical epidemiologist, Division of Viral Hepatitis (DVH), CDC; and Linda A. Moyer, RN, IAC consultant, who until her retirement, was an epidemiologist and chief, Education and Training Team, at DVH.

Immunization questions

One morning, our refrigerator thermometer registered 32 degrees F. The vaccine didn’t look frozen so we kept using it. Was this okay?

No. If you find that a vaccine has been exposed to an inappropriate temperature, determine the reason for the temperature alteration, mark the vaccine “Do Not Use,” and contact the manufacturer or state/local health department to determine if the vaccine can be used.

Where can I obtain standing orders for vaccination?

The Immunization Action Coalition (IAC) has developed suggested standing orders for all vaccines commonly given to children and adults. They are based on CDC’s Advisory Committee on Immunization Practices (ACIP) recommendations and are reviewed for technical accuracy by CDC staff. You can find the standing orders and protocols for medical management of vaccine reactions at www.immunize.org/standingorders.

If a person of any age is diagnosed with pertussis, can they forego pertussis vaccination?

If someone has a recent culture-confirmed case of pertussis, he or she may not need immediate immunization against pertussis; however, a vaccine containing pertussis antigen will not be harmful. A person with a culture-confirmed case or a history of pertussis should continue on the routine immunization schedule for future protection against tetanus, diphtheria, and pertussis.

For whom is influenza vaccine now recommended?

CDC recommends annual vaccination for all of the following: (1) all persons age 6 months or older, including all school-aged children, who want to reduce the likelihood of becoming ill with influenza or of transmitting it to others; (2) all persons age 50 years and older; (3) all children age 6 through 59 months; (4) all persons with any of the following conditions: chronic disorder of the pulmonary or cardiovascular system (including asthma), chronic metabolic disease (including diabetes), renal dysfunction, hemoglobinopathy, conditions that place one at risk for aspiration or immunosuppression (including immunosuppression caused by medications or by HIV), children or adolescents age 6 months through 18 years who are receiving long-term aspirin therapy, and therefore might be at risk for experiencing Reye’s syndrome after influenza infection; (5) women who will be pregnant during the influenza season; (6) residents of nursing homes or other chronic-care facilities that house persons of any age who have chronic medical conditions; (7) all persons (such as healthcare personnel, caregivers, or household members) who have contact with, and are therefore likely to transmit influenza to, persons who have high-risk conditions; (8) household contacts or out-of-home caretakers of children age 0 through 59 months or of adults age 50 years or older.

During which month should I start administering influenza vaccine?

You can begin offering vaccine as soon as it becomes available. Planners of mass vaccination programs may want to consider scheduling their efforts after mid-October to increase the probability of having adequate vaccine supplies on hand.

How late in the season can I vaccinate my patients with influenza vaccine?

Influenza activity generally does not peak until February or later. As long as vaccine is available, providers are encouraged to continue vaccinating patients throughout the influenza season, including into the spring months. Because influenza occurs in many areas of the world during the spring and summer, vaccine should be given to travelers who missed vaccination in the preceding fall and winter.

If a person has influenza, when and for how long are they infectious to others?

Adults can be infectious from 1 day before symptoms occur through approximately 5 days after illness onset. Young children can shed virus several months through 18 years who are receiving long-term aspirin therapy, and therefore might be at risk for experiencing Reye’s syndrome after influenza infection; (5) women who will be pregnant during the influenza season; (6) residents of nursing homes or other chronic-care facilities that house persons of any age who have chronic medical conditions; (7) all persons (such as healthcare personnel, caregivers, or household members) who have contact with, and are therefore likely to transmit influenza to, persons who have high-risk conditions; (8) household contacts or out-of-home caretakers of children age 0 through 59 months or of adults age 50 years or older.
Immunization Action Coalition’s most popular web sections are newly designed, easy to use

Whether you’re a newcomer or a frequent visitor to the Immunization Action Coalition’s (IAC’s) website for health professionals, www.immunize.org, it’s an exciting time to stop by for a visit. IAC is moving forward with a comprehensive redesign of the website. The changes to the layout are designed to make it easier for you to find the breadth of information that is available about childhood, adolescent, and adult immunization. We’re redesigning it in such a way that you’ll find what you need quickly and come back often.

IAC unveils the new design with some of our most popular web sections: Vaccine Information Statements, Ask the Experts, and IAC’s print and electronic periodicals.

Vaccine Information Statements (VISs)
IAC’s most frequently visited web section is the VIS home page, the main stop for thousands of visitors each day. Navigate to www.immunize.org/vis and download up-to-date VISs in more than 30 languages, including English. All VISs on IAC’s site are in ready-to-print (PDF) format. In addition, you’ll find instructions from the government about how VISs should be used.

Ask the Experts
Another “hot spot” on immunize.org is the Ask the Experts web section. At www.immunize.org/askexperts, you’ll find compilations of more than 1,000 Q&As about immunization and viral hepatitis that have appeared in past issues of IAC’s periodicals, Needle Tips, Vaccinate Adults, and Vaccinate Women. The Q&As are written by CDC immunization experts William L. Atkinson, MD, MPH, and Andrew T. Kroger, MD, MPH, and hepatitis expert Joanna Buffington, MD, MPH. The main page now features a disease/vaccine index and offers users an index of subtopics pertinent to the disease/vaccine, such as schedule, administration, and contraindications, as well as tables and other graphic elements that organize and explain complex information. Ask the Experts Q&As are reviewed annually. To access them, go to www.immunize.org/askexperts.

Periodicals and E-publications
IAC’s free print periodicals and e-publications for health professionals are also online and feature the new design. Current issues (and complete archives) are available to share with medical and nursing staff.

Needle Tips: www.immunize.org/nt
Vaccinate Adults: www.immunize.org/va
Vaccinate Women: www.immunize.org/vw
IAC Express: www.immunize.org/express
Hep Express: www.hepprograms.org/hepexpress

If you aren’t familiar with some of these publications and would like to learn about them, visit the links above. In addition, you can subscribe to all of them (they’re free of charge) at www.immunize.org/subscribe.

Future plans for redesign
The next immunize.org web sections “in the works” for redesign are IAC’s free print materials section, www.immunize.org/free, and our journal articles section, www.immunize.org/journals. So check back often to see what’s new.

Also, make sure you’re a subscriber to IAC Express so you can stay up to date about what’s new at www.immunize.org and in the world of immunization. IAC Express is published every Monday and it’s free! Subscribe at www.immunize.org/subscribe.

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Ask the Experts www.immunize.org/askexperts
IAC’s free periodicals and email news www.immunize.org/subscribe

If you have a website, please link to IAC! www.immunize.org www.vaccineinformation.org

DISCLAIMER: Vaccinate Adults! 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 compiled or created 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 St. Paul, Minnesota.
Immunization record cards available 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. The three cards list all vaccines recommended for each age. All are printed on durable rip-, smudge-, and waterproof paper. Wallet-sized when folded, the cards are brightly colored to stand out. To view them or for more details, go to www.immunize.org/shop and click on the images.

Buy 1 box (250 cards) for $35 (first order of a 250-card box comes with a 30-day, money-back guarantee)
Discounts for larger orders: 2 boxes (500 cards) $65; 3 boxes (750 cards) $90; 4 boxes (1000 cards) $110

To order, visit www.immunize.org/shop, or use the order form on page 11. (To receive sample cards, email your request to admin@immunize.org.)

Do you vaccinate adults or children? Then your practice needs this training video!

“Immunization Techniques: Safe, Effective, Caring” developed by California Dept. of Public Health Immunization Branch

Cost is $30 for VHS video; $35 for DVD.
For 20 or more copies, contact us for discount pricing. To order, visit www.immunize.org/shop, or use the order form on page 11.

Laminated adult and child immunization schedules Order them for every exam room

Here are the CDC/AAP/ACOG/ACP-approved immunization schedule for adults and the CDC/AAP/AAPF-approved schedule for children age 0–18 years. Both are laminated for heavy-duty use, complete with essential footnotes, and printed in color for easy reading. The cost is $5 for each schedule and only $3 each for five or more copies. For 20 or more copies, contact us for discount pricing.

To order, visit www.immunize.org/shop, or use the order form on page 11.
days before illness onset and can be infectious for 10 or more days after onset of symptoms. Severely immunocompromised persons can shed virus for weeks or months.

I’ve heard that almost 75% of people in the U.S. are already recommended for influenza vaccination. Why don’t we just have universal influenza vaccination? It would be so much easier than assessing the risk of each patient.

It’s true that the number of people who are in the age-targeted groups (i.e., age 6 through 59 months, age 50 years or older) combined with those age 5–49 years with risk factors or who are household contacts of those with risk factors, amounts to 73% of the U.S. population. Though it may be a few more years before we reach universal influenza vaccination, CDC now recommends vaccination for anyone who wants to reduce the likelihood of becoming ill with influenza or of transmitting it to others. Therefore, you can be comfortable recommending influenza vaccine for all your patients who want to be immune and don’t want to spread influenza to others.

Sometimes I am unable to get 10 doses of influenza vaccine out of a 5.0 mL (10-dose) vial. Do you have any suggestions?

Certain vaccine syringes have small hubs where a volume of the vaccine that is withdrawn from the vial collects and is not available to be injected. Syringes without a hub are available; their use results in less vaccine wastage.

I heard about a hospital where more than 95% of employees received influenza vaccine last year. How did they achieve that?

Virginia Mason Medical Center in Seattle, WA, completed 2 years of mandatory employee influenza vaccination, achieving 98% compliance in the 2006–07 year. Toolkits, as well as other materials from a variety of organizations and the presentation on the Virginia Mason program given at the 2007 National Influenza Vaccine Summit, are available at www.preventinfluenza.org/profs_workers.asp.

Does the thimerosal in influenza vaccine pose a risk?

Thimerosal, a very effective preservative, has been used to prevent bacterial contamination in vaccine vials for more than 50 years. It contains a type of mercury known as ethylmercury, which is different from the type of mercury found in fish and seafood (methylmercury). At very high levels, methylmercury can be toxic to people, especially to the neurological development of infants.

In recent years, several large scientific studies have determined that thimerosal in vaccines does not lead to neurologic problems, such as autism. Nonetheless, because we generally try to reduce people’s exposure to mercury if at all possible, vaccine manufacturers have voluntarily changed their production methods to produce vaccines that are now free of thimerosal or have only trace amounts. They have done this because it is possible to do, not because there was any evidence that the thimerosal was harmful.

To which patients should I recommend human papillomavirus (HPV) vaccine?

CDC recommends that females age 11–12 years be vaccinated with 3 doses of HPV vaccine. Additionally, HPV vaccine is recommended for all females age 13–26 years who have not been previously vaccinated or who have not completed the full series. The vaccination series can be started as young as age 9 years. Ideally, vaccine should be administered before potential exposure to HPV through sexual contact; however, females who are sexually active or who have had HPV infection or an abnormal Pap test should also be vaccinated. CDC’s official recommendations are available at www.cdc.gov/mmwr/pdf/rr/rr56e312.pdf.

What are the dosing intervals when using HPV vaccine?

CDC recommends the second dose be given 2 months after the first, and the third dose be given 6 months after the first. The minimum intervals are 4 weeks between dose 1 and dose 2, and 12 weeks between dose 2 and dose 3. If necessary the series can be completed in 16 weeks.

If a woman has had HPV infection, can she still be vaccinated?

Yes. Women who have evidence of present or past HPV infection and who are younger than age 27 years should be vaccinated. They should be advised that the vaccine will not have a therapeutic effect on existing HPV infection or any cervical lesions.

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

HPV vaccine is not FDA-licensed for use in women older than age 26 years at this time. Studies are currently being conducted in women age 27 years and older. CDC does not recommend the use of this vaccine outside the FDA licensing guidelines; however, many physicians administer this vaccine as off-label use. There is no reason to believe the vaccine would be any less safe for women in this age group than for younger women. Clinicians should decide if the benefit of the vaccine outweighs the hypothetical risk.

When will CDC publish its official recommendations for the use of Zostavax®?

Until then, what should I use to guide me?

CDC has posted its provisional recommendations at www.cdc.gov/vaccines/recs/provisional/default.htm. The official recommendations are expected to be published in MMWR in early 2008. However, zoster vaccine will be included in the 2007-08 Recommended Adult Immunization Schedule, which CDC plans to release in MMWR in October 2007.

Who should receive shingles (zoster) vaccine?

A single dose of zoster vaccine is recommended for adults age 60 years and older whether or not they report a prior episode of herpes zoster. Persons with chronic medical conditions may be vaccinated unless a contraindication or precaution exists for their condition.

Will administering Zostavax prevent post-herpetic neuralgia (PHN)?

In pre-licensure trials, Zostavax was 66.5% effective in preventing PHN. It is also believed to lessen the severity of both shingles and PHN if a person should acquire the disease after vaccination.

Hepatitis A and B

Which adults are recommended to receive hepatitis B vaccine?

CDC recommends that the following groups receive hepatitis B vaccination:

- Sexually active persons who are not in long-term, mutually monogamous relationships
- Sex partners of HBsAg-positive persons
- Persons seeking evaluation or treatment for a sexually transmitted disease
- Men who have sex with men
- Current or recent injection-drug users
- Household contacts of HBsAg-positive persons
- Residents and staff of facilities for developmentally disabled persons
- Healthcare and public safety workers with reasonably anticipated risk for exposure to blood or blood-contaminated body fluids
- Persons with end-stage renal disease, including predialysis, hemo-, peritoneal-, and home-dialysis patients
- International travelers to regions with intermediate or high levels (i.e., ≥2% of HBsAg positivity; see Figure 4 in ACIP recommendations). The new recommendations do not specify the length of the trip.
- Persons with chronic liver disease
- Persons with HIV infection
- All other persons who wish to be protected from HBV infection

Acknowledgement of a specific risk factor is NOT a requirement for vaccination. The official CDC recommendations for hepatitis B vaccination of adults are available at www.cdc.gov/mmwr/PDF/rr/rr5516.pdf. For your use, a hepatitis B vaccination screening questionnaire is available from IAC at www.immunize.org/catg.d/2191hepb.pdf. Standing orders for administering hepatitis B vac-

Do you have patients who are HBsAg-positive?

They need medical monitoring, including liver cancer screening; many can benefit from treatment.

The FDA licenses several medications for treatment in the United States.

Consult a liver specialist experienced in the treatment of viral hepatitis for appropriate monitoring guidelines and for help in determining which of your patients might benefit from treatment.
cine to adults are also available from IAC at www.immunize.org/catg.d/p3076.pdf.

What does CDC recommend regarding screening and vaccination of Asian Americans and Pacific Islanders and people from other hepatitis B endemic areas?

All foreign-born people (including immigrants, refugees, asylum seekers, and internationally adopted children) born in Asia, the Pacific Islands, Africa, and other regions with high endemicity of HBV infection should be tested for HBsAg, regardless of vaccination status.

In addition, hepatitis B vaccination is recommended for all children age 0–18 years, and for all unvaccinated adults at risk for HBV infection, as well as for all adults requesting protection from HBV infection.

How do you serologically define chronic HBV infection?

A person is considered to have chronic HBV infection if he or she is (1) HBsAg positive on two occasions at least 6 months apart, or (2) HBsAg positive and IgM class antiHBc (antibody to hepatitis B core antigen) negative on a single blood draw. (An IgM class antiHBc test will be positive for 4–6 months after acute HBV infection.)

Which HBsAg-positive patients should be considered infectious?

All HBsAg-positive persons should be considered infectious, regardless of HBBeAg (hepatitis B e antigen) status. (See lab nomenclature on this page for HBBeAg definition.)

What is Twinrix® vaccine? Who can receive it?

Twinrix (GlaxoSmithKline) is an inactivated combination vaccine containing both hepatitis A virus (HAV) and HBV antigens. The vaccine contains 720 EL.U. of hepatitis A antigen (half of the Havrix® adult dose) and 20µg of hepatitis B antigen (the full Engerix-B® adult dose). In the U.S., Twinrix is licensed for use in people who are age 18 years or older. It can be administered to persons who are at risk for both hepatitis A and hepatitis B, such as certain international travelers, men who have sex with men, illegal drug users, or to persons who simply want to be immune to both diseases.

Primary immunization consists of 3 doses given intramuscularly on a 0, 1, and 6 month schedule. In March 2007, the FDA also approved a 4-dose schedule for Twinrix. It consists of 3 doses given within 3 weeks, followed by a booster dose at 12 months (0, 7 days, 21–30 days, and 12 months). The 4-dose schedule could benefit individuals needing rapid protection from hepatitis A and hepatitis B, such as persons traveling to high-prevalence areas imminently and emergency responders, especially those being deployed to disaster areas overseas.

For which adults is hepatitis A vaccine recommended?

CDC recommends hepatitis A vaccination for all adults who

• travel to areas with increased rates of hepatitis A (everywhere EXCEPT Canada, Australia, New Zealand, Japan, and Western Europe)
• are men who have sex with men
• use either injecting or non-injecting illegal drugs (including "pot")
• have clotting-factor disorders, such as hemophilia
• have chronic liver disease
• desire immunity to hepatitis A virus infection

Adults should be given 2 doses of hepatitis A vaccine spaced at least 6 months apart.

How do I interpret the results of some of the commonly ordered panels of hepatitis B tests?

<table>
<thead>
<tr>
<th>Tests</th>
<th>Results</th>
<th>Interpretation</th>
<th>Vaccinate?</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBsAg</td>
<td>negative</td>
<td>susceptible</td>
<td>vaccinate if indicated</td>
</tr>
<tr>
<td>anti-HBc</td>
<td>negative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>anti-HBs</td>
<td>negative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HBsAg</td>
<td>negative</td>
<td>immune due to vaccination</td>
<td>no vaccination necessary</td>
</tr>
<tr>
<td>anti-HBc</td>
<td>positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>anti-HBs</td>
<td>positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HBsAg</td>
<td>positive</td>
<td>acutely infected</td>
<td>no vaccination necessary</td>
</tr>
<tr>
<td>anti-HBc</td>
<td>positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IgM anti-HBc</td>
<td>negative</td>
<td>chronically infected (may need treatment)</td>
<td></td>
</tr>
<tr>
<td>anti-HBs</td>
<td>positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HBsAg</td>
<td>negative</td>
<td>four interpretations possible†</td>
<td>use clinical judgment</td>
</tr>
<tr>
<td>anti-HBc</td>
<td>positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>anti-HBs</td>
<td>negative</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Postvaccination testing, when it is recommended, should be performed 1–2 months after the last dose of vaccine. Infants born to HBsAg-positive mothers should be tested 3–9 months after the last dose.

† May be recovering from acute HBV infection
‡ May be distantly immune, but the test may not be sensitive enough to detect a very low level of anti-HBs in serum
§ May be susceptible with a false positive anti-HBc
¶ May be chronically infected and have an undetectable level of HBsAg present in the serum

Hepatitis A and B lab tests

Hepatitis A lab nomenclature

anti-HAV: Antibody to hepatitis A virus. This diagnostic test detects total antibody of both IgG and IgM subclasses of HAV. Its presence indicates either acute or resolved infection.

IgM anti-HAV: IgM antibody subclass of anti-HAV. Its presence indicates a recent infection with HAV (6 mos or less). It is used to diagnose acute hepatitis A.

Hepatitis B lab nomenclature

HBsAg: Hepatitis B surface antigen is a marker of infectivity. Its presence indicates either acute or chronic HBV infection.

anti-HBs: Antibody to hepatitis B surface antigen is a marker of immunity. Its presence indicates an immune response to HBV infection, an immune response to vaccination, or the presence of passively acquired antibody. (It is also known as HBsAb, but this abbreviation is best avoided since it is often confused with abbreviations such as HBsAg.)

anti-HBc (total): Antibody to hepatitis B core antigen is a nonspecific marker of acute, chronic, or resolved HBV infection. It is not a marker of vaccine-induced immunity. It may be used in prevaccination testing to determine previous exposure to HBV infection. (It is also known as HBcAb, but this abbreviation is best avoided since it is often confused with other abbreviations.)

IgM anti-HBc: IgM antibody subclass of anti-HBc. Positivity indicates recent infection with HBV (within the past 6 mos). Its presence indicates acute infection.

HBBeAg: Hepatitis B “e” antigen is a marker of a high degree of HBV infectivity, and it correlates with a high level of HBV replication. It is primarily used to help determine the clinical management of patients with chronic HBV infection.

Anti-HBc: Antibody to hepatitis B “e” antigen may be present in an infected or immune person. In persons with chronic HBV infection, its presence suggests a low viral titer and a low degree of infectivity.

HBV-DNA: HBV Deoxyribonucleic acid is a marker of viral replication. It correlates well with infectivity. It is used to assess and monitor the treatment of patients with chronic HBV infection.
Influenza education materials for patients & staff

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

For 8-1/2" x 11" copies of the pieces above, visit IAC’s website at www.immunize.org/free

5. Give these people influenza vaccine!: www.immunize.org/catg.d/p2013.pdf
Viral hepatitis education materials for patients and staff
Free and CDC-reviewed, they’re ready for you to download, copy, and use!

For 8-1/2” x 11” copies of the pieces above, visit IAC’s website at www.immunize.org/free
5. Questions frequently asked about hepatitis B: www.immunize.org/catg.d/p4090.pdf
## Summary of Recommendations for Adult Immunization

<table>
<thead>
<tr>
<th>Vaccine and route</th>
<th>For whom vaccination is recommended</th>
<th>Schedule for vaccine administration</th>
<th>Contraindications and precautions</th>
</tr>
</thead>
</table>
| **Influenza**    | • All persons wanting to reduce the likelihood of becoming ill with influenza or of spreading it to others.  
• Persons age 50yrs and older.  
• Persons with medical problems (e.g., heart disease, lung disease, diabetes, renal dysfunction, hemoglobinopath, immunosuppression).  
• Persons with any condition that compromises respiratory function or the handling of respiratory secretions or that can increase the risk of aspiration (e.g., cognitive dysfunction, spinal cord injury, seizure disorder, or other neuromuscular disorder).  
• Persons living in chronic care facilities.  
• Persons working or living with at-risk people.  
• Women who will be pregnant during the influenza season (December–March).  
• All healthcare personnel and other persons who provide direct care to at-risk people.  
• Household contacts and out-of-home caregivers of children age 0–59m.  
• Travelers at risk for complications of influenza who go to areas where influenza activity exists or who may be among people from areas of the world where there is current influenza activity (e.g., on organized tours).  
• Students or other persons in institutional settings (e.g., dormitory residents).  | • Give 1 dose every year in the fall or winter.  
• Vaccine should be given as soon as it is available and should 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.  | • Previous anaphylactic reaction to this vaccine, to any of its components, or to eggs.  
• Moderate or severe acute illness.  
| **Precautions** | Moderate or severe acute illness.  | **Contraindications** | **Precautions** |
| **Influenza**    | • All persons wanting to reduce the likelihood of becoming ill with influenza or of spreading it to others.  
• Healthy, non-pregnant persons age 49yrs and younger who meet any of the criteria listed below:  
  - Working or living with at-risk people as listed in the section above.  
  - Healthcare personnel or other persons who provide direct care to at-risk people (except persons in close contact with severely immunosuppressed persons).  
  - Household contacts and out-of-home caregivers of children age 0–59m.  
  - Travelers who may be among people from areas of the world where there is current influenza activity (e.g., on organized tours).  
  - Students or other persons in institutional settings (e.g., dormitory residents).  | • Give 1 dose every year in the fall or winter.  
• Vaccine should be given as soon as it is available and should 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.  | • Previous anaphylactic reaction to this vaccine, to any of its components.  
• Pregnancy, asthma, reactive airway disease or other chronic disease of the pulmonary or cardiovascular system; an underlying medical condition, including metabolic disease such as diabetes, renal dysfunction, and hemoglobinopathy; a known or suspected immune deficiency disease or current receipt of immunosuppressive therapy; history of GBS.  
• Moderate or severe acute illness.  | **Precautions** | Moderate or severe acute illness.  |
| **Pneumococcal poly-saccharide (PPV)** | • Persons age 65yrs and older.  
• Persons who have chronic illness or other risk factors, including chronic cardiac or pulmonary disease, chronic liver disease, alcoholism, diabetes, CSF leak, as well as people living in special environments or social settings (including Alaska Natives and certain American Indian populations). Those at highest risk of fatal pneumococcal infection are persons with anatomic asplenia, functional asplenia, or sickle cell disease; immunocompromised persons including those with HIV infection, leukemia, lymphoma, Hodgkin’s disease, multiple myeloma, generalized malignancy, chronic renal failure, or nephrotic syndrome; persons receiving immunosuppressive chemotherapy (including corticosteroids); those who received an organ or bone marrow transplant; and candidates for or recipients of cochlear implants.  | • Routinely given as a 1-time dose; administer if previous vaccination history is unknown.  
• One-time revaccination is recommended 5yrs later for persons at highest risk of fatal pneumococcal infection or rapid antibody loss (e.g., renal disease) and for persons age 65yrs and older if the 1st dose was given prior to age 65yrs and 5yrs or more have elapsed since the previous dose.  | • Previous anaphylactic reaction to this vaccine, to any of its components.  
• Moderate or severe acute illness.  | **Precautions** | Moderate or severe acute illness.  |

*This document was adapted from the recommendations of the Advisory Committee on Immunization Practices (ACIP). To obtain copies of these recommendations, call the CDC-INFO Contact Center at (800) 232-4636; visit CDC’s website at [www.cdc.gov/vaccines/pubs/ACIP-list.htm](http://www.cdc.gov/vaccines/pubs/ACIP-list.htm); or visit the Immunization Action Coalition (IAC) website at [www.immunize.org/acip](http://www.immunize.org/acip). This table is revised periodically. Visit IAC’s website at [www.immunize.org/adultrules](http://www.immunize.org/adultrules) to make sure you have the most current version.*
## Summary of Recommendations for Adult Immunization (continued)

<table>
<thead>
<tr>
<th>Vaccine name and route</th>
<th>For whom vaccination is recommended</th>
<th>Schedule for vaccine administration (any vaccine can be given with another)</th>
<th>Contraindications and precautions (mild illness is not a contraindication)</th>
</tr>
</thead>
</table>
| **Hepatitis B** (HepB) | - All persons through age 18yrs.  
- All adults wishing to obtain immunity against hepatitis B virus infection.  
- High-risk persons, including household contacts and sex partners of HBsAg-positi- 
  
  ve persons; injecting drug users; sexually active persons not in a long-term, 
  mutually monogamous relationship; men who have sex with men; persons with 
  HIV or a recently diagnosed STD; patients receiving hemodialysis and patients 
  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; and certain 
  international travelers.  
- Persons with chronic liver disease.  
  
  **Note:** Provide serologic screening for immigrants from endemic areas.  
  If patient is chronically infected, assure appropriate disease management. Screen sex partners 
  and household members; give HepB at the same visit if not already vaccinated. | - Three doses are needed on a 0, 1, 6m schedule.  
- Alternative timing options for vaccination include 0, 2, 4m and 0, 1, 4m.  
- There must be 4wks between doses #1 and #2, and 6wks 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. |

| **Hepatitis A** (HepA) | - All persons wishing to obtain immunity to hepatitis A virus infection.  
- Persons who travel or work anywhere EXCEPT the U.S., Western Europe, New 
  Zealand, Australia, Canada, and Japan.  
- Persons with chronic liver disease, including persons with hepatitis B and C; 
  injecting and non-injecting drug users; men who have sex with men; people with 
  clotting-factor disorders; persons who work with hepatitis A virus in experimental 
  lab settings (not routine medical laboratories); and food handlers when health 
  authorities or private employers determine vaccination to be appropriate.  
  
  **Note:** Prevaccination testing is likely to be cost effective for persons older than age 
  40yrs, as well as for younger persons in certain groups with a high prevalence of 
  hepatitis A virus infection. | - Two doses are needed.  
- The minimum interval between doses #1 and #2 is 6m.  
- If dose #2 is delayed, do not repeat dose #1. Just give dose #2. | **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. |

| **Td, Tdap** (Tetanus, diphtheria, pertussis) | - All adults who lack a history of a primary series consisting of at least 3 doses of 
  tetanus- and diphtheria-toxoid-containing vaccine.  
- A booster dose of tetanus- and diphtheria-toxoid-containing vaccine may be 
  needed for wound management as early as 5yrs after receiving a previous dose, 
  so consult ACIP recommendations.*  
- Using tetanus toxoid (TT) instead of Td or Tdap is not recommended.  
- 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:**  
  - All adults younger than age 65yrs who have not already received Tdap.  
  - Healthcare personnel who work in hospitals or ambulatory care settings and have 
  direct patient contact and who have not received Tdap.  
  - Adults in contact with infants younger than age 12m (e.g., parents, grandparents 
  younger than age 65yrs, childcare providers, healthcare personnel) who have not 
  received a dose of Td should be prioritized for vaccination. | - For persons who are unvaccinated or behind, complete the primary series with 
  Td (spaced at 0, 1–2m, 6–12m intervals). One-time dose of Tdap may be used for 
  any dose if age 18–64yrs.  
- Give Td booster every 10yrs after the primary series has been completed. For 
  adults age 18–64yrs, a 1-time dose of Tdap is recommended to replace the next Td.  
- Intervals of 2yrs or less between Td and Tdap may be used.  
  
  **Note:** The two Tdap products are licensed for different age groups: Adacel™ (sanofi) for use in persons age 11–64yrs and Boostrix® (GSK) for use in persons age 10–18yrs. | **Contraindications**  
- Previous anaphylactic reaction to this vaccine or to any of its components.  
- For Tdap only, history of encephalopathy within 7d following DTP/DTaP.  
**Precautions**  
- Moderate or severe acute illness.  
- GBS within 6wks of receiving a previous dose of tetanus-toxoid-containing vaccine.  
- Unstable neurologic condition.  
- History of arthus reaction following a previously received dose of diphtheria-toxoid-containing vaccine, including MCV4.  
  
  **Note:** Use of Td/Tdap is not contraindicated in pregnancy. Either vaccine may be given during 
  trimester #2 or #3 at the provider’s discretion. |

| **Polio** (IPV) | Not routinely recommended for persons 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 (i.e., India, Pakistan, Afghanistan, and 
  Nigeria). Previously vaccinated adults can receive one booster dose if traveling to 
  polio endemic areas. | - Refer to ACIP recommendations* regarding unique situations, schedules, and 
  dosing information. | **Contraindication**  
Previous anaphylactic or neurologic reaction to this vaccine or to any of its components.  
**Precautions**  
- Moderate or severe acute illness.  
- Pregnancy. |
### Summary of Recommendations for Adult Immunization (continued)

<table>
<thead>
<tr>
<th>Vaccine name and route</th>
<th>For whom vaccination is recommended</th>
<th>Schedule for vaccine administration (any vaccine can be given with another)</th>
<th>Contraindications and precautions (mild illness is not a contraindication)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Varicella (Var)</strong></td>
<td>• All adults without evidence of immunity. <strong>Note:</strong> Evidence of immunity is defined as a history of 2 doses of varicella vaccine; born in the U.S. before 1980 (exception: healthcare personnel and pregnant women); a history of varicella disease or herpes zoster based on healthcare provider diagnosis; laboratory evidence of immunity; and/or laboratory confirmation of disease.</td>
<td>• Two doses are needed.  • Dose #2 is given 4–8wks after dose #1.  • If Var and either MMR, LAIV, and/or yellow fever vaccine are not given on the same day, space them at least 28d apart.  • If the second dose is delayed, do not repeat dose #1. Just give dose #2.</td>
<td><strong>Contraindications</strong>  • Previous anaphylactic reaction to this vaccine or to any of its components.  • Pregnancy or possibility of pregnancy within 4wks.  • Persons 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).  <strong>Precautions</strong>  • 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.  • Moderate or severe acute illness. <strong>Note:</strong> For those on high-dose immunosuppressive therapy, consult ACIP recommendations regarding delay time.*</td>
</tr>
<tr>
<td><strong>Meningococcal</strong></td>
<td>• All persons age 11 through 18yrs.  • College freshmen living in dormitories.  • Persons with anatomic or functional asplenia or with terminal complement component deficiencies.  • Persons 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 N. meningitidis.</td>
<td>• One dose is needed.  • If previous vaccine was MPSV4, revaccinate after 5yrs if risk continues.  • Revaccination after MCV4 is not recommended.  • MCV4 is preferred over MPSV4 for persons age 55yrs and younger, although MPSV4 is an acceptable alternative.</td>
<td><strong>Contraindication</strong> Previous anaphylactic or neurologic reaction to this vaccine or to any of its components, including diphtheria toxoid (for MCV4).  <strong>Precautions</strong>  • Moderate or severe acute illness.  • For MCV4 only, history of Guillain-Barré syndrome (GBS).  <strong>Note:</strong> Evidence of immunity is defined as a history of varicella disease or herpes zoster based on healthcare provider diagnosis; laboratory evidence of immunity; and/or laboratory confirmation of disease.</td>
</tr>
<tr>
<td><strong>MMR</strong></td>
<td>• Persons in high-risk groups, such as healthcare personnel, students entering college and other post–high school educational institutions, and international travelers, should receive a total of 2 doses.  • Persons born before 1957 are usually considered immune, but proof of immunity (serology or vaccination) may be desirable for healthcare personnel.  • Women of childbearing age who do not have acceptable evidence of rubella immunity or vaccination.</td>
<td>• One or 2 doses are needed.  • If dose #2 is recommended, give it no sooner than 4wks after dose #1.  • If MMR and either Var, LAIV, and/or yellow fever vaccine are not given on the same day, space them at least 28d apart.  • If a pregnant woman is found to be rubella susceptible, administer MMR postpartum.</td>
<td><strong>Contraindications</strong>  • Previous anaphylactic reaction to this vaccine or to any of its components.  • Pregnancy or possibility of pregnancy within 4wks.  • Persons immunocompromised because of cancer, leukemia, lymphoma, immunosuppressive drug therapy, including high-dose steroids or radiation therapy. <strong>Note:</strong> HIV positivity is NOT a contraindication to MMR except for those who are severely immunocompromised (i.e., CD4+ T-lymphocyte counts are less than 200 cells/µL).  <strong>Precautions</strong>  • 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.  • Moderate or severe acute illness.  • History of thrombocytopenia or thrombocytopenic purpura. <strong>Note:</strong> If PPD (tuberculosis skin test) and MMR are both needed but not given on same day, delay PPD for 4–6wks after MMR.  <strong>Precaution</strong> Data on vaccination in pregnancy are limited. Vaccination should be delayed until after completion of the pregnancy.</td>
</tr>
<tr>
<td><strong>Human papillomavirus</strong> (HPV)</td>
<td>All previously unvaccinated women through age 26yrs.</td>
<td>• Three doses are needed on a 0, 2, 6m schedule.  • The minimum interval between doses #1 and #2 is 4wks, and between #2 and #3 is 12wks.</td>
<td><strong>Contraindication</strong> Previous anaphylactic reaction to this vaccine or to any of its components.  <strong>Precaution</strong> Data on vaccination in pregnancy are limited. Vaccination should be delayed until after completion of the pregnancy.  <strong>Note:</strong> Evidence of immunity is defined as a history of varicella disease or herpes zoster based on healthcare provider diagnosis; laboratory evidence of immunity; and/or laboratory confirmation of disease.  <em><em>ACIP statement General Recommendations on Immunization</em> regarding time to wait before vaccinating.  • Moderate or severe acute illness.  • Previous anaphylactic or neurologic reaction to this vaccine or to any of its components.  <strong>Note:</strong> Evidence of immunity is defined as a history of varicella disease or herpes zoster based on healthcare provider diagnosis; laboratory evidence of immunity; and/or laboratory confirmation of disease.  <strong>Contraindications</strong>  • Previous anaphylactic reaction to this vaccine or to any of its components.  <strong>Precautions</strong>  • Moderate or severe acute illness.  <strong>Note:</strong> For those on high-dose immunosuppressive therapy, consult ACIP recommendations regarding delay time.</em></td>
</tr>
<tr>
<td><strong>Varicella (Zos)</strong></td>
<td>ACIP has voted to recommend herpes zoster (shingles) vaccine for all persons age 60yrs and older who do not have contraindications. Provisional recommendations are online at <a href="http://www.cdc.gov/vaccines/recs/provisional/default.htm#acip">www.cdc.gov/vaccines/recs/provisional/default.htm#acip</a>.</td>
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<tr>
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<td>$35</td>
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<tr>
<td><strong>V2020</strong> Videotape: Immunization Techniques: Safe, Effective, Caring</td>
<td>$30</td>
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Deborah L. Wexler, MD

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deborah@immunize.org

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