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VACCINATE ADULTS!

A bulletin for adult medicine specialists from the Immunization Action Coalition

Highlighting the latest developments in adult immunization and hepatitis B prevention and screening

Artwork courtesy of New York State Department of Health

What's Inside?

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 J. 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

In addition to annual influenza vaccination, which vaccinations should be given to healthcare personnel?

The recommendations for healthcare personnel include vaccination for or evidence of immunity to influenza, hepatitis B, MMR, varicella, pertussis, and for certain laboratory personnel only, meningococcal vaccination. You can find a summary of these recommendations on page 5 of this issue of *Vaccinate Adults.*

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)

Please summarize the newly published recommendations for the use of Tdap vaccine in adults.

The following recommendations for a single dose of Tdap (ADACEL®) apply to adults ages 19–64 years who have not yet received Tdap. After receiving Tdap, adults should receive the standard Td booster every ten years.

- **Routine:** Adults should receive a single dose of Tdap to replace a single dose of Td for booster immunization against tetanus, diphtheria, and pertussis if they received their most recent tetanus toxoid-containing vaccine (e.g., Td) 10 or more years earlier.
- **Short intervals between Td and Tdap:** Tdap can be administered at an interval of less than 10 years since the last dose of Td to protect against pertussis. The safety of intervals as short as approximately 2 years between administration of Td and Tdap is supported by a Canadian study of children and adolescents; intervals shorter than 2 years may be used.
- **Prevention of pertussis among infants younger than age 12 months by vaccinating adult contacts:** Adults who have or who anticipate having close contact with an infant younger than age 12 months (e.g., parents, grandparents, child-care providers, and healthcare personnel) should receive a single dose of Tdap. An interval as short as 2 years since the most recent tetanus toxoid-containing vaccine is suggested; intervals shorter than 2 years may be used. Ideally, Tdap should be administered at least 2 weeks before beginning close contact with the infant. Women should receive a dose of Tdap in the immediate postpartum period if they have not previously received Tdap. Any woman who might become pregnant is encouraged to receive a single dose of Tdap.
- **Vaccination of healthcare personnel (HCP):** HCP in hospitals and ambulatory-care settings who have direct patient contact should receive a single dose of Tdap as soon as feasible if they have not previously received Tdap. An interval as short as 2 years from the last dose of Td is recommended; intervals shorter than 2 years may be used. Other HCP should receive a single dose of Tdap according to the routine recommendation; they are encouraged also to receive Tdap at an interval as short as 2 years. Priority should be given to vaccination of HCP who have direct contact with infants younger than age 12 months. Hospitals and ambulatory-care facilities should provide Tdap for HCP and use approaches that maximize vaccination rates.
- **History of pertussis:** Adults with a history of pertussis generally should receive Tdap according to the routine recommendations.
- **Tetanus prophylaxis in wound management:** Adults ages 19–64 years who require a tetanus toxoid-containing vaccine as part of wound management should receive Tdap instead of Td if they have not previously received Tdap. If Tdap is not available or was administered previously, Td should be administered.
- **Incomplete or unknown vaccination history:** Adults who have never received tetanus and diphtheria toxoid-containing vaccine should receive a series of three vaccinations. The preferred schedule is a single dose of Tdap followed by Td at least 4 weeks later and a second dose of Td 6–12 months after the previous dose. Tdap can substi-

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Vaccinate Adults!

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

The Hepatitis B Coalition, a program of IAC, promotes hepatitis B vaccination; HBsAg screening for all pregnant women; testing and vaccination for high-risk groups; and education and treatment for people chronically infected with hepatitis B virus.

tute for Td for any one of the 3 doses in the series.

- **Pregnancy:** Pregnancy is not a contraindication for Tdap or Td vaccination. Guidance on the use of Tdap during pregnancy is published separately in provisional recommendations for use of Tdap in pregnant women. See www.cdc.gov/nip/recs/provisional_recs/default.htm.

To obtain a copy of CDC's "Preventing Tetanus, Diphtheria, and Pertussis Among Adults," go to www.cdc.gov/mmwr/PDF/rr/rr5517.pdf.

Which women should receive HPV vaccine?
Human papillomavirus (HPV) vaccine, Gardasil™ (Merck), is recommended for all women through age 26 years. Ideally, the vaccine should be administered before onset of sexual activity, but sexually active females should still be vaccinated.

Gardasil is licensed as a 3-dose series, with dose #2 given 2 months after dose #1, and dose #3 given 4 months after dose #2. The minimum interval between doses #1 and #2 is 4 weeks, and between doses #2 and #3 is 12 weeks. The vaccine should be administered IM in the deltoid.

To obtain a copy of CDC's official recommendations for the use of HPV vaccine, go to www.cdc.gov/mmwr/pdf/rr/rr56e312.pdf.

I've heard that a nasal influenza vaccine formulation that is stable at refrigerator temperatures will be available next fall. True?
Yes, FluMist® was recently licensed as a cold adapted influenza vaccine (CAIV-T). This vaccine is stable at refrigerator temperatures (does not need to be frozen) and will be available for the 2007–08 vaccination season.

For whom is shingles (zoster) vaccination recommended?
A single dose of zoster vaccine is recommended for adults 60 years of age 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.

Why isn't zoster (shingles) vaccine included on the recently published "2006–07 Recommended Adult Immunization Schedule"?
Because the official recommendations had not yet been published when the schedule was finalized. However, this shouldn't prevent any provider from routinely vaccinating adults ages 60 years and older. Follow the instructions on the package insert. CDC has released provisional recommendations for the use of zoster vaccine. They are posted at www.cdc.gov/nip/recs/provisional_recs/default.htm.

Looking for the latest vaccine recommendations and resources?

Look here!

www.immunize.org/newreleases
www.immunize.org/new

Hepatitis A and B

According to the recently released ACIP hepatitis B recommendations for adults, which adults should be vaccinated?
The following groups are recommended for hepatitis B vaccination.

- Sex partners of HBsAg-positive persons
- Sexually active persons who are not in long-term, mutually monogamous relationships
- Persons seeking evaluation or treatment for a sexually transmitted disease (STD)
- Men who have sex with men (MSM)
- Current or recent injection-drug users
- Household contacts of HBsAg-positive persons
- Residents and staff of facilities for developmentally challenged 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., HBsAg prevalence greater than or equal to 2%) of endemic HBV infection.
- 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.

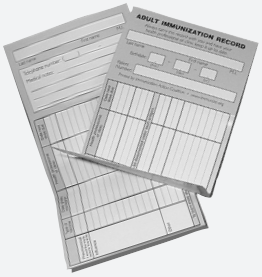
The official CDC recommendations are available at www.cdc.gov/mmwr/PDF/rr/rr5516.pdf.

Can you provide some guidance for implementing hepatitis B vaccination in primary care settings?
In primary care and specialty medical settings, CDC recommends implementation of standing orders for identifying adults recommended for hepatitis B vaccination and for administering vaccination as part of routine services. To ensure vaccination of adults at risk for HBV infection who have not completed the vaccine series, CDC recommends the following:

- Provide information to all adults regarding the health benefits of hepatitis B vaccination, including risk factors for HBV infection and persons for whom vac-

(continued on page 4)

Immunization record cards available for all ages—For adults, for children & teens, or for a lifetime!



Now you can give any patient a permanent vaccination record card designed specifically for their age group: adult, child & teen, or lifetime. The three different cards list all vaccines recommended for each age. The cards are printed on durable rip-, smudge-, and water-proof paper. Wallet-sized when folded, the cards are brightly colored to stand out. To view the cards or for more details, go to www.immunize.org/shop and click on the images.

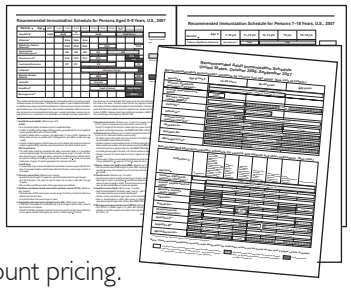
Buy 1 box (250 cards) for $35 (first order of a 250-card box comes with a 30-day, money-back guarantee)

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.)

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



Here are the ACIP/AAP/AAFP-approved immunization schedule for people ages 0–18 years and the ACIP/AAFP/ACOG/ACP-approved schedule for adults. 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.

Do you vaccinate adults or children?

Then your practice needs this training video!

"Immunization Techniques: Safe, Effective, Caring"

developed by California Dept. of Health Services 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.

Questions? Email admin@immunize.org or call (651) 647-9009.

cination is recommended

- Help all adults assess their need for vaccination by obtaining a history that emphasizes risks for sexual transmission and percutaneous or mucosal exposure to blood
- Vaccinate all adults who report risks for HBV infection
- Vaccinate all adults requesting protection from HBV infection, without requiring them to acknowledge a specific risk factor

For your use, a hepatitis B vaccination screening questionnaire is available at www.immunize.org/catg.d/2191hepb.pdf. Standing orders for administering hepatitis B vaccine to adults are available at www.immunize.org/catg.d/p3076.pdf.

In which high-risk settings should hepatitis B vaccine be universally administered?

In certain settings, a high proportion of persons are likely to be at risk for HBV infection and all patients in these settings who have not completed the series should be vaccinated. Examples include STD/HIV testing and treatment facilities; drug-abuse treatment and prevention settings; healthcare settings targeting services to men who have sex with men; correctional facilities; chronic hemodialysis facilities and end-stage renal disease programs; and institutions and non-residential day care facilities for developmentally challenged persons.

How do I manage a patient with a sexual exposure to HBV?

These recommendations are too lengthy to address in *Vaccinate Adults*. Refer to Appendix B of the ACIP adult hepatitis B recommendations at www.cdc.gov/mmwr/pdf/rr/rr5516.pdf. It fully covers this topic.

If a person wants to be protected from hepatitis A and isn't in a risk group, is there any reason not to vaccinate him?

No. ACIP recommends hepatitis A vaccination for any person who wants to be protected from hepatitis A virus (HAV) infection.

Which travelers should be vaccinated against HAV infection?

Optimally, all U.S. travelers who travel to or work in countries outside the U.S.—except Western Europe, New Zealand, Australia, Canada, and Japan—should receive hepatitis A vaccine at least one month prior to departure.

For hepatitis A, is it really necessary to vaccinate travelers to Latin America who will be staying in 4-star hotels?

Yes. Data have shown that persons acquire HAV infection even in such places as 4-star hotels located in Latin America.

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

Tests	Results	Interpretation	Vaccinate?
HBsAg anti-HBc anti-HBs	negative negative negative	susceptible	vaccinate if indicated
HBsAg anti-HBc anti-HBs	negative negative positive with ≥10mIU/mL*	immune due to vaccination	no vaccination necessary
HBsAg anti-HBc anti-HBs	negative positive positive	immune due to natural infection	no vaccination necessary
HBsAg anti-HBc IgM anti-HBc anti-HBs	positive positive positive negative	acutely infected	no vaccination necessary
HBsAg anti-HBc IgM anti-HBc anti-HBs	positive positive negative negative	chronically infected	no vaccination necessary (may need treatment)
HBsAg anti-HBc anti-HBs	negative positive negative	four interpretations possible†	use clinical judgment

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

†1. May be recovering from acute HBV infection
2. May be distantly immune, but the test may not be sensitive enough to detect a very low level of anti-HBs in serum
3. May be susceptible with a false positive anti-HBc
4. 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.

HBeAg: *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-HBe: *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.

Healthcare Personnel Vaccination Recommendations

Vaccine	Recommendations in brief
Hepatitis B	Give 3-dose series (dose #1 now, #2 in 1 month, #3 approximately 5 months after #2). Give IM. Obtain anti-HBs serologic testing 1–2 months after dose #3.
Influenza	Give 1 dose of TIV or LAIV annually. Give TIV intramuscularly or LAIV intranasally.
MMR	For healthcare personnel (HCP) born in 1957 or later without serologic evidence of immunity or prior vaccination, give 2 doses of MMR, 4 weeks apart. For HCP born prior to 1957, see below. Give SC.
Varicella (chickenpox)	For HCP who have no serologic proof of immunity, prior vaccination, or history of varicella disease, give 2 doses of varicella vaccine, 4 weeks apart. Give SC.
Tetanus, diphtheria, pertussis	Give all HCP a Td booster dose every 10 years, following the completion of the primary 3-dose series. Give a 1-time dose of Tdap to all HCP younger than age 65 years with direct patient contact. Give IM.
Meningococcal	Give 1 dose to microbiologists who are routinely exposed to isolates of *N. meningitidis.*

Hepatitis A, typhoid, and polio vaccines are not routinely recommended for HCP who may have on-the-job exposure to fecal material.

Hepatitis B

Healthcare personnel (HCP) who perform tasks that may involve exposure to blood or body fluids should receive a 3-dose series of hepatitis B vaccine at 0-, 1-, and 6-month intervals. Test for hepatitis B surface antibody (anti-HBs) to document immunity 1–2 months after dose #3.

- If anti-HBs is at least 10 mIU/mL (positive), the patient is immune. No further serologic testing or vaccination is recommended.
- If anti-HBs is less than 10 mIU/mL (negative), the patient is unprotected from hepatitis B virus (HBV) infection; revaccinate with a 3-dose series. Retest anti-HBs 1–2 months after dose #3.
  - If anti-HBs is positive, the patient is immune. No further testing or vaccination is recommended.
  - If anti-HBs is negative following 6 doses of vaccine, the patient is a non-responder.

For non-responders: HCP who are non-responders should be considered susceptible to HBV and should be counseled regarding precautions to prevent HBV infection and the need to obtain HBIG prophylaxis for any known or probable parenteral exposure to hepatitis B surface antigen (HBsAg)-positive blood.[1] It is also possible that non-responders are persons who are HBsAg positive. Testing should be considered. HCP found to be HBsAg positive should be counseled and medically evaluated.

Note: Anti-HBs testing is not recommended routinely for previously vaccinated HCP who were not tested 1–2 months after their original vaccine series. These HCP should be tested for anti-HBs when they have an exposure to blood or body fluids. If found to be anti-HBs negative, the HCP should be treated as if susceptible.[1]

Influenza

Trivalent (Inactivated) Influenza Vaccine (TIV): May give to any HCP.
Live, Attenuated Influenza Vaccine (LAIV): May give to any non-pregnant healthy HCP age 49 years and younger.

1. All HCP should receive annual influenza vaccine. Groups that should be targeted include all personnel (including volunteers) in hospitals, outpatient, and home-health settings who have any patient contact.
2. TIV is preferred over LAIV for HCP who are in close contact with severely immunosuppressed persons (e.g., stem cell transplant patients) when patients require a protective environment.

Measles, Mumps, Rubella (MMR)

HCP who work in medical facilities should be immune to measles, mumps, and rubella.

- HCP born in 1957 or later can be considered immune to measles, mumps, or rubella only if they have documentation of (a) physician-diagnosed measles or mumps disease; or (b) laboratory evidence of measles, mumps, or rubella immunity (HCP who have an "indeterminate" or "equivocal" level of immunity upon testing should be considered nonimmune); or (c) appropriate vaccination against measles, mumps, and rubella (i.e., administration on or after the first birthday of two doses of live measles and mumps vaccines separated by 28 days or more, and at least one dose of live rubella vaccine).
- Although birth before 1957 generally is considered acceptable evidence of measles, mumps, and rubella immunity, healthcare facilities should consider recommending a dose of MMR vaccine (two doses during a mumps outbreak) to unvaccinated HCP born before 1957 who are in either of the following categories: (a) do not have a history of physician-diagnosed measles and mumps disease or laboratory evidence of measles and mumps immunity and (b) do not have laboratory evidence of rubella immunity.

Varicella

It is recommended that all HCP be immune to varicella. Evidence of immunity in HCP includes documentation of 2 doses of varicella vaccine given at least 28 days apart, history of varicella or herpes zoster based on physician diagnosis, laboratory evidence of immunity, or laboratory confirmation of disease.

Tetanus/Diphtheria/Pertussis (Td/Tdap)

All adults who have completed a primary series of a tetanus/diphtheria-containing product (DTP, DTaP, DT, Td) should receive Td boosters every 10 years. As soon as feasible, HCP younger than age 65 years with direct patient contact should be given a 1-time dose of Tdap, with priority given to those having contact with infants younger than age 12 months.

Meningococcal

Vaccination is recommended for microbiologists who are routinely exposed to isolates of *N. meningitidis.* Use of MCV4 is preferred among persons ages 11–55 years; give IM. If MCV4 is unavailable, MPSV is an acceptable alternative for HCP ages 11–55 years. Use of MPSV is recommended for HCP older than age 55; give SC.

References

1. See Table 3 in "Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis," *MMWR*, June 29, 2001, Vol. 50, RR-11.

For additional specific ACIP recommendations, refer to the official ACIP statements published in *MMWR.* To obtain copies, visit CDC's website at www.cdc.gov/nip/publications/ACIP-list.htm; or visit the Immunization Action Coalition (IAC) website at www.immunize.org/acip.

Adapted with thanks from the Michigan Department of Community Health

www.immunize.org/catg.d/p2017.pdf • Item #P2017 (3/07)

Recommended Adult Immunization Schedule
United States, October 2006–September 2007

Recommended adult immunization schedule, by vaccine and age group (See note at bottom.)

Vaccine ▼ / Age group ▶	19–49 years	50–64 years	≥65 years
Tetanus, diphtheria, pertussis (Td/Tdap)[1]*	1-dose Td booster every 10 yrs; Substitute 1 dose of Tdap for Td		
Human papillomavirus (HPV)[2]	3 doses (females)		
Measles, mumps, rubella (MMR)[3]*	1 or 2 doses	1 dose	
Varicella[4]*	2 doses (0, 4–8 wks)	2 doses (0, 4–8 wks)	
Influenza[5]*	1 dose annually	1 dose annually	
Pneumococcal (polysaccharide)[6,7]	1–2 doses		1 dose
Hepatitis A[8]*	2 doses (0, 6–12 mos, or 0, 6–18 mos)		
Hepatitis B[9]*	3 doses (0, 1–2, 4–6 mos)		
Meningococcal[10]	1 or more doses		

Recommended adult immunization schedule, by vaccine and medical and other indications (See note.)

Vaccine ▼ / Indication ▶	Pregnancy	Congenital immunodeficiency; leukemia;[11] lymphoma; generalized malignancy; cerebrospinal fluid leaks; therapy with alkylating agents, antimetabolites, radiation, or high-dose, long-term corticosteroids	Diabetes, heart disease, chronic pulmonary disease, chronic alcoholism	Asplenia[11] (including elective splenectomy and terminal complement component deficiencies)	Chronic liver disease, recipients of clotting factor concentrates	Kidney failure, end-stage renal disease, recipients of hemodialysis	Human immunodeficiency virus (HIV) infection[3,11]	Health-care workers
Tetanus, diphtheria, pertussis (Td/Tdap)[1]*	1-dose Td booster every 10 yrs; Substitute 1 dose of Tdap for Td							
Human papillomavirus (HPV)[2]	3 doses for females through age 26 years (0, 2, 6 mos)							
Measles, mumps, rubella (MMR)[3]*	Contraindicated	1or 2 doses						
Varicella[4]*	Contraindicated	2 doses (0, 4–8 wks)				Contraindicated		2 doses
Influenza[5]*	1 dose annually			1 dose annually	1 dose annually			
Pneumococcal (polysaccharide)[6,7]	1–2 doses	1–2 doses						1–2 doses
Hepatitis A[8]*	2 doses (0, 6–12 mos, or 0, 6–18 mos)				2 doses	2 doses (0, 6–12 mos, or 0, 6–18 mos)		
Hepatitis B[9]*	3 doses (0, 1–2, 4–6 mos)				3 doses (0, 1–2, 4–6 mos)			
Meningococcal[10]	1 dose			1 dose	1 dose			

*Covered by the Vaccine Injury Compensation Program

Note: These recommendations must be read along with the footnotes, which can be found on the next 3 pages of this schedule.

For all persons in this category who meet the age requirements and who lack evidence of immunity (e.g., lack documentation of vaccination or have no evidence of prior infection)

Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

Contraindicated

This schedule indicates the recommended age groups and medical indications for routine administration of currently licensed vaccines for persons aged ≥19 years, as of October 1, 2006. Licensed combination vaccines may be used whenever any components of the combination are indicated and when the vaccine's other components are not contraindicated. For detailed recommendations on all vaccines, including those used primarily for travelers or that are issued during the year, consult the manufacturers' package inserts and the complete statements from the Advisory Committee on Immunization Practices (http://www.cdc.gov/nip/publications/acip-list.htm).

Report all clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting System (VAERS). Reporting forms and instructions on filing a VAERS report are available at http://www.vaers.hhs.gov or by telephone, 800-822-7967.

Information on how to file a Vaccine Injury Compensation Program claim is available at http://www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382.To file a claim for vaccine injury, contact the U.S. Court of Federal Claims, 717 Madison Place, N.W., Washington, D.C. 20005; telephone, 202-357-6400.

Additional information about the vaccines in this schedule and contraindications for vaccination is also available at www.cdc.gov/nip or from the CDC-INFO Contact Center at 800-CDC-INFO (800-232-4636) in English and Spanish, 24 hours a day, 7 days a week.

Footnotes

1. Tetanus, diphtheria, and acellular pertussis (Td/Tdap) vaccination. Adults with uncertain histories of a complete primary vaccination series with diphtheria and tetanus toxoid–containing vaccines should begin or complete a primary vaccination series. A primary series for adults is 3 doses; administer the first 2 doses at least 4 weeks apart and the third dose 6–12 months after the second. Administer a booster dose to adults who have completed a primary series and if the last vaccination was received ≥10 years previously. Tdap or tetanus and diphtheria (Td) vaccine may be used; Tdap should replace a single dose of Td for adults aged <65 years who have not previously received a dose of Tdap (either in the primary series, as a booster, or for wound management). Only one of two Tdap products (Adacel® [sanofi pasteur]) is licensed for use in adults. If the person is pregnant and received the last Td vaccination ≥10 years previously, administer Td during the second or third trimester; if the person received the last Td vaccination in <10 years, administer Tdap during the immediate postpartum period. A one-time administration of 1 dose of Tdap with an interval as short as 2 years from a previous Td vaccination is recommended for postpartum women, close contacts of infants aged <12 months, and all healthcare workers with direct patient contact. In certain situations, Td can be deferred during pregnancy and Tdap substituted in the immediate postpartum period, or Tdap can be given instead of Td to a pregnant woman after an informed discussion with the woman (see http://www.cdc.gov/nip/publications/acip-list.htm). Consult the ACIP statement for recommendations for administering Td as prophylaxis in wound management (http://www.cdc.gov/mmwr/preview/mmwrhtml/00041645.htm).

2. Human Papillomavirus (HPV) vaccination. HPV vaccination is recommended for all women aged ≤26 years who have not completed the vaccine series. Ideally, vaccine should be administered before potential exposure to HPV through sexual activity; however, women who are sexually active should still be vaccinated. Sexually active women who have not been infected with any of the HPV vaccine types receive the full benefit of the vaccination. Vaccination is less beneficial for women who have already been infected with one or more of the four HPV vaccine types. A complete series consists of 3 doses. The second dose should be administered 2 months after the first dose; the third dose should be administered 6 months after the first dose. Vaccination is not recommended during pregnancy. If a woman is found to be pregnant after initiating the vaccination series, the remainder of the 3-dose regimen should be delayed until after completion of the pregnancy.

3. Measles, Mumps, Rubella (MMR) vaccination. *Measles component:* adults born before 1957 can be considered immune to measles. Adults born during or after 1957 should receive ≥1 dose of MMR unless they have a medical contraindication, documentation of ≥1 dose, history of measles based on health-care provider diagnosis, or laboratory evidence of immunity. A second dose of MMR is recommended for adults who 1) have been recently exposed to measles or in an outbreak setting; 2) were previously vaccinated with killed measles vaccine; 3) have been vaccinated with an unknown type of measles vaccine during 1963–1967; 4) are students in postsecondary educational institutions; 5) work in a health-care facility, or 6) plan to travel internationally. Withhold MMR or other measles-containing vaccines from HIV-infected persons with severe immunosuppression. *Mumps component:* adults born before 1957 can generally be considered immune to mumps. Adults born during or after 1957 should receive 1 dose of MMR unless they have a medical contraindication, history of mumps based on health-care provider diagnosis, or laboratory evidence of immunity. A second dose of MMR is recommended for adults who 1) are in an age group that is affected during a mumps outbreak; 2) are students in postsecondary educational institutions; 3) work in a health-care facility; or 4) plan to travel internationally. For unvaccinated health-care workers born before 1957 who do not have other evidence of mumps immunity, consider giving 1 dose on a routine basis and strongly consider giving a second dose during an outbreak. *Rubella component:* administer 1 dose of MMR vaccine to women whose rubella vaccination history is unreliable or who lack laboratory evidence of immunity. For women of childbearing age, regardless of birth year, routinely determine rubella immunity and counsel women regarding congenital rubella syndrome. Do not vaccinate women who are pregnant or who might become pregnant within 4 weeks of receiving vaccine. Women who do not have evidence of immunity should receive MMR vaccine upon completion or termination of pregnancy and before discharge from the health-care facility.

continued on next page . . .

Footnotes (continued)

4. Varicella vaccination. All adults without evidence of immunity to varicella should receive 2 doses of varicella vaccine. Special consideration should be given to those who 1) have close contact with persons at high risk for severe disease (e.g., health-care workers and family contacts of immunocompromised persons) or 2) are at high risk for exposure or transmission (e.g., teachers of young children; child care employees; residents and staff members of institutional settings, including correctional institutions; college students; military personnel; adolescents and adults living in households with children; nonpregnant women of childbearing age; and international travelers). Evidence of immunity to varicella in adults includes any of the following: 1) documentation of 2 doses of varicella vaccine at least 4 weeks apart; 2) U.S.–born before 1980 (although for health-care workers and pregnant women, birth before 1980 should not be considered evidence of immunity); 3) history of varicella based on diagnosis or verification of varicella by a health-care provider (for a patient reporting a history of or presenting with an atypical case, a mild case, or both, health-care providers should seek either an epidemiologic link with a typical varicella case or evidence of laboratory confirmation, if it was performed at the time of acute disease); 4) history of herpes zoster based on health-care provider diagnosis; or 5) laboratory evidence of immunity or laboratory confirmation of disease. Do not vaccinate women who are pregnant or might become pregnant within 4 weeks of receiving the vaccine. Assess pregnant women for evidence of varicella immunity. Women who do not have evidence of immunity should receive dose 1 of varicella vaccine upon completion or termination of pregnancy and before discharge from the health-care facility. Dose 2 should be administered 4–8 weeks after dose 1.

5. Influenza vaccination: *Medical indications:* chronic disorders of the cardiovascular or pulmonary systems, including asthma; chronic metabolic diseases, including diabetes mellitus, renal dysfunction, hemoglobinopathies, or immunosuppression (including immunosuppression caused by medications or HIV); 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, or seizure disorder or other neuromuscular disorder); and pregnancy during the influenza season. No data exist on the risk for severe or complicated influenza disease among persons with asplenia; however, influenza is a risk factor for secondary bacterial infections that can cause severe disease among persons with asplenia. *Occupational indications:* health-care workers and employees of long-term–care and assisted living facilities. *Other indications:* residents of nursing homes and other long-term–care and assisted living facilities; persons likely to transmit influenza to persons at high risk (e.g., in-home household contacts and caregivers of children aged 0–59 months, or persons of all ages with high-risk conditions); and anyone who would like to be vaccinated. Healthy, nonpregnant persons aged 5–49 years without high-risk medical conditions who are not contacts of severely immunocompromised persons in special care units can receive either intranasally administered influenza vaccine (FluMist®) or inactivated vaccine. Other persons should receive the inactivated vaccine.

6. Pneumococcal polysaccharide vaccination. *Medical indications:* chronic disorders of the pulmonary system (excluding asthma); cardiovascular diseases; diabetes mellitus; chronic liver diseases, including liver disease as a result of alcohol abuse (e.g., cirrhosis); chronic renal failure or nephrotic syndrome; functional or anatomic asplenia (e.g., sickle cell disease or splenectomy [if elective splenectomy is planned, vaccinate at least 2 weeks before surgery]); immunosuppressive conditions (e.g., congenital immunodeficiency, HIV infection [vaccinate as close to diagnosis as possible when CD4 cell counts are highest], leukemia, lymphoma, multiple myeloma, Hodgkin disease, generalized malignancy, organ or bone marrow transplantation); chemotherapy with alkylating agents, antimetabolites, or high-dose, long-term corticosteroids; and cochlear implants. *Other indications:* Alaska Natives and certain American Indian populations and residents of nursing homes or other long-term–care facilities.

7. Revaccination with pneumococcal polysaccharide vaccine. One-time revaccination after 5 years for persons with chronic renal failure or nephrotic syndrome; functional or anatomic asplenia (e.g., sickle cell disease or splenectomy); immunosuppressive conditions (e.g., congenital immunodeficiency, HIV infection, leukemia, lymphoma, multiple myeloma, Hodgkin disease, generalized malignancy, or organ or bone marrow transplantation); or chemotherapy with alkylating agents, antimetabolites, or high-dose, long-term corticosteroids. For persons aged ≥65 years, one-time revaccination if they were vaccinated ≥5 years previously and were aged <65 years at the time of primary vaccination.

8. Hepatitis A vaccination. *Medical indications:* persons with chronic liver disease and persons who receive clotting factor concentrates. *Behavioral indications:* men who have sex with men and persons who use illegal drugs. *Occupational indications:* persons working with hepatitis A virus (HAV)–infected primates or with HAV in a research laboratory setting. *Other indications:* persons traveling to or working in countries that have high or intermediate endemicity of hepatitis A (a list of countries is available at http://www.cdc.gov/travel/diseases.htm) and any person who would like to obtain immunity. Current vaccines should be administered in a 2-dose schedule at either 0 and 6–12 months, or 0 and 6–18 months. If the combined hepatitis A and hepatitis B vaccine is used, administer 3 doses at 0, 1, and 6 months.

9. Hepatitis B vaccination. *Medical indications:* Persons with end-stage renal disease, including patients receiving hemodialysis; persons seeking evaluation or treatment for a sexually transmitted disease (STD); persons with HIV infection; persons with chronic liver disease; and persons who receive clotting factor concentrates. *Occupational indications:* health-care workers and public-safety workers who are exposed to blood or other potentially infectious body fluids. *Behavioral indications:* sexually active persons who are not in a long-term, mutually monogamous relationship (i.e., persons with >1 sex partner during the previous 6 months); current or recent injection-drug users; and men who have sex with men. *Other indications:* household contacts and sex partners of persons with chronic hepatitis B virus (HBV) infection; clients and staff members of institutions for persons with developmental disabilities; all clients of STD clinics; international travelers to countries with high or intermediate prevalence of chronic HBV infection (a list of countries is available at http://www.cdc.gov/travel/diseases.htm); and any adult seeking protection from HBV infection. Settings where hepatitis B vaccination is recommended for all adults: STD treatment facilities; HIV testing and treatment facilities; facilities providing drug-abuse treatment and prevention services; health-care settings providing services for injection-drug users or men who have sex with men;

continued on next page . . .

Footnotes (continued)

correctional facilities; end-stage renal disease programs and facilities for chronic hemodialysis patients; and institutions and nonresidential daycare facilities for persons with developmental disabilities. *Special formulation indications:* for adult patients receiving hemodialysis and other immunocompromised adults, 1 dose of 40 microgram/mL (Recombivax HB®) or 2 doses of 20 microgram/mL (Engerix-B®).

10. Meningococcal vaccination. *Medical indications:* adults with anatomic or functional asplenia, or terminal complement component deficiencies. *Other indications:* first-year college students living in dormitories; microbiologists who are routinely exposed to isolates of *Neisseria meningitidis*; military recruits; and persons who travel to or live in countries in which meningococcal disease is hyperendemic or epidemic (e.g., the "meningitis belt" of sub-Saharan Africa during the dry season [December–June]), particularly if contact with local populations will be prolonged. Vaccination is required by the government of Saudi Arabia for all travelers to Mecca during the annual Hajj. Meningococcal conjugate vaccine is preferred for adults with any of the preceding indications who are aged ≤55 years, although meningococcal polysaccharide vaccine (MPSV4) is an acceptable alternative. Revaccination after 5 years might be indicated for adults previously vaccinated with MPSV4 who remain at high risk for infection (e.g., persons residing in areas in which disease is epidemic).

11. Selected conditions for which *Haemophilus influenzae* type b (Hib) vaccination may be used. Hib conjugate vaccines are licensed for children aged 6 weeks–71 months. No efficacy data are available on which to base a recommendation concerning use of Hib vaccine for older children and adults with the chronic conditions associated with an increased risk for Hib disease. However, studies suggest good immunogenicity in patients who have sickle cell disease, leukemia, or HIV infection or have had splenectomies; administering vaccine to these patients is not contraindicated.

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

The Immunization Action Coalition adapted the design of this schedule from CDC.

The Immunization Action Coalition created this adult immunization schedule based on the **Recommended Adult Immunization Schedule, U.S., October 2006–September 2007,** published in the *Morbidity and Mortality Weekly Report (MMWR)* on October 13, 2006. It is also available as a 4-page, 8 ½" x 11" booklet, laminated and in full color (see ordering information below).

The Recommended Adult Immunization Schedule is updated annually by the Centers for Disease Control and Prevention (CDC). Vaccination recommendations issued by CDC after the October 2006 publication date are official but are not reflected in this schedule until the next year's schedule is published. To be sure you have the most current vaccination recommendations from CDC, visit the following web pages:

Official ACIP recommendations
www.cdc.gov/nip/publications/acip-list.htm (alphabetical order)
www.immunize.org/acip (chronological order)

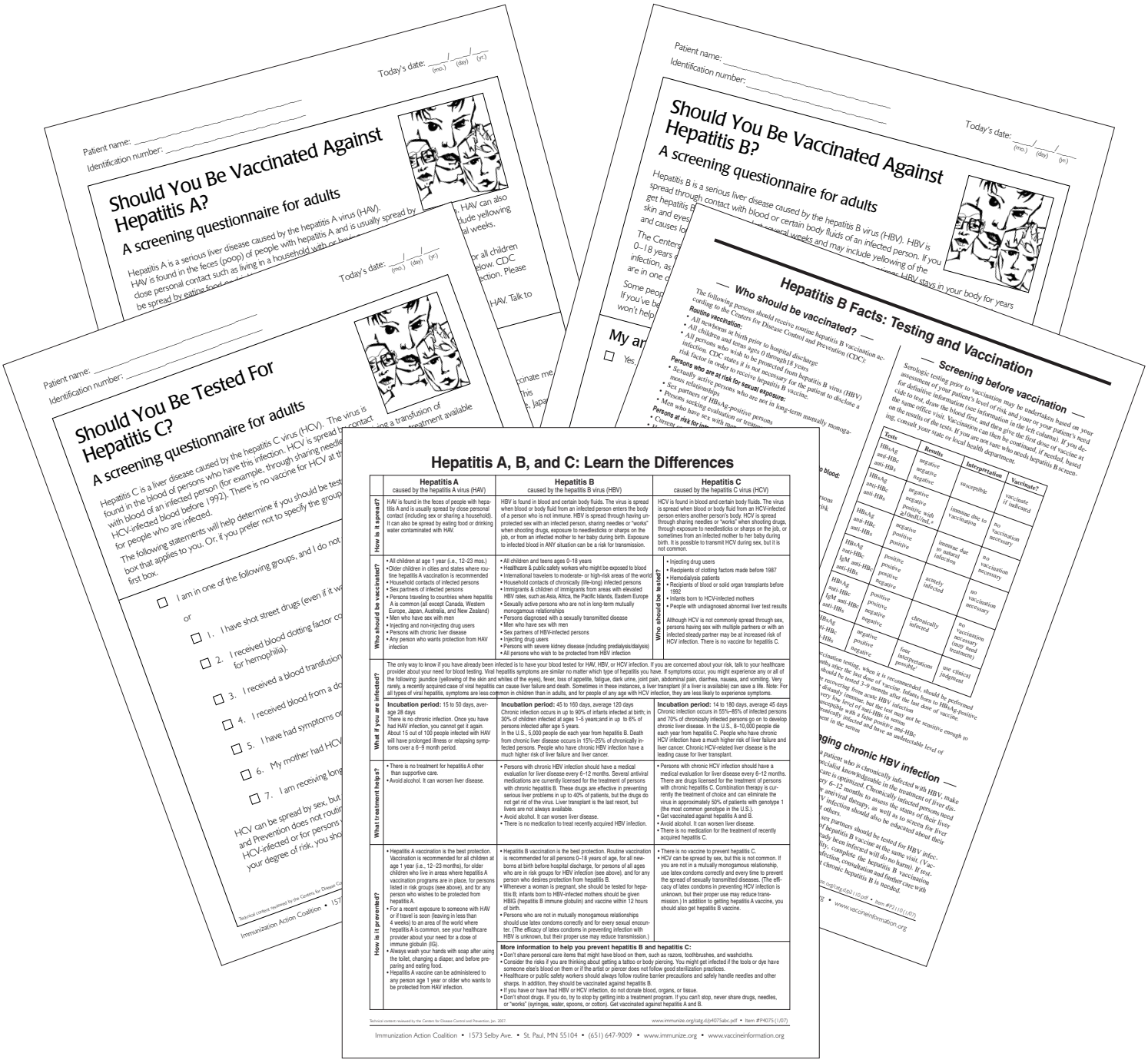
Provisional ACIP recommendations
www.cdc.gov/nip/recs/provisional_recs/default.htm
www.immunize.org/acip

For more information on CDC's adult immunization recommendations, go to www.cdc.gov/nip/recs/adult-schedule.htm.

To order laminated, color copies of this adult immunization schedule from the Immunization Action Coalition, visit www.immunize.org/shop or call (651) 647-9009.

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: www.immunize.org.

1. Should you be vaccinated against hepatitis A?: **www.immunize.org/catg.d/2190hepa.pdf**
2. Should you be vaccinated against hepatitis B?: **www.immunize.org/catg.d/2191hepb.pdf**
3. Should you be tested for hepatitis C?: **www.immunize.org/catg.d/2192hepc.pdf**
4. Hepatitis B Facts: Testing and Vaccination: **www.immunize.org/catg.d/p2110.pdf**
5. Hepatitis A, B, and C: Learn the Differences: **www.immunize.org/catg.d/p4075abc.pdf**

Essential Immunization Resources from IAC

IAC's website (www.immunize.org/free) offers you hundreds of free print materials for health professionals and patients. All are CDC reviewed, periodically updated, ready to copy, and available for your immediate use. Use them or adapt them to meet your practice's needs. In addition to using them, we hope you'll purchase some of our essential resources (see below) and send a donation if you can.

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	250 cards/box; 1 box—$35; 2 boxes—$65; 3 boxes—$90; 4 boxes—$110	
____	R2005 Adult immunization record cards ..... $	_____
____	R2003 Child/teen immunization record cards ..... $	_____
____	R2004 Lifetime immunization record cards ..... $	_____
	DVD, Videotape, and CD-ROM (details p. 3; discounts on bulk orders)	
____	D2020 DVD: Immunization Techniques: Safe, Effective, Caring $35	_____
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Immunization Action Coalition resources keep you current!

Deborah L. Wexler, MD
IAC Executive Director

Dear Colleagues,

It's a new day for protecting adults from some very serious diseases. Now, all women age 26 and younger should be vaccinated against human papillomavirus (HPV) which can cause cervical cancer. Further, adults can now be protected from pertussis (whooping cough) and herpes zoster (shingles). And recommendations for the use of influenza, hepatitis A, and hepatitis B vaccines include vaccinating anyone who wants to be protected from these diseases.

Human papillomavirus (HPV) vaccine. Approved by the FDA in June 2006 for use in females ages 9–26, HPV vaccine begins a new era in cancer prevention. Prelicensure studies show the vaccine is nearly 100 percent effective against precancerous lesions caused by the HPV-virus types included in the vaccine. These types account for approximately 70% of cervical cancer cases. In the United States, approximately 9,710 women develop cervical cancer each year and 3,700 die from it. Refer to the "Resources" section at the end of this letter for a weblink to CDC's recently published recommendations.

Tdap (tetanus, diphtheria, acellular pertussis) vaccine for adults. Licensed in 2005, Tdap is recommended as a one-time dose for all adolescents and for adults younger than age 65. It replaces a single booster dose of Td (tetanus diphtheria vaccine). To protect infants from deadly pertussis, it is particularly important to give Tdap to parents of children younger than age 1. For a weblink to CDC's recent recommendations, see the "Resources" section at the end of this letter.

Herpes zoster (shingles) vaccine. Licensed by the FDA in May 2006, this vaccine protects adults from shingles. It is licensed for persons age 60 years and older. Until official vaccine recommendations are available, consult the package insert for details on the use of this vaccine.

Influenza vaccine. Influenza vaccine continues to be routinely recommended every year for all adults age 50 years and older and for many others in risk groups. The vaccine is also recommended annually for any person who desires protection from influenza.

Hepatitis A and hepatitis B vaccines. In addition to being recommended for persons in risk groups, these vaccines are also recommended for any person who wants to be protected from hepatitis A or hepatitis B.

Resources. There are many national resources available to help fine-tune your vaccination knowledge and practices. Here are links to some of them:

- *IAC Express.* IAC's free email news service keeps you up to date on the latest vaccine recommendations. Sign up at www.immunize.org/subscribe.
- CDC's recommendations on vaccine use. Visit www.immunize.org/acip.
- IAC's print materials. Reviewed by CDC for technical accuracy and ready for you to copy and share with patients and clinic staff, these materials include standing orders for every vaccine. Visit www.immunize.org/free.
- IAC's comprehensive immunization website for health professionals is online at www.immunize.org.

Feel free to contact me anytime at deborah@immunize.org if I can be of assistance with a vaccination issue.

Deborah L. Wexler, MD

Deborah L. Wexler, MD
Executive Director

Thank you to CDC, our primary supporter!
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Thank you, readers!
We greatly appreciate your financial support and your comments and suggestions.

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