

# VACCINATE WOMEN

A periodical for obstetrician/gynecologists from the Immunization Action Coalition

Highlighting the latest developments in routine immunization and hepatitis B prevention



## Ask the Experts

*Editor's note: The Immunization Action Coalition thanks William L. Atkinson, MD, MPH; Eric E. Mast, MD; and Linda A. Moyer, RN, of the Centers for Disease Control and Prevention (CDC) for answering the following questions for our readers. Dr. Atkinson, medical epidemiologist at the National Immunization Program, serves as a CDC liaison to the Coalition. Dr. Mast and Ms. Moyer are epidemiologists at the Division of Viral Hepatitis.*

### General vaccine questions

by William L. Atkinson, MD, MPH

#### Which vaccines are given intramuscularly (IM) and which subcutaneously (SC)?

The following vaccines should be given IM: hepatitis A, hepatitis B, inactivated influenza, and tetanus-diphtheria. The vaccines that should be given SC include MMR, meningococcal, and varicella. Inactivated polio and pneumococcal polysaccharide vaccines can be given either IM or SC.

#### What size needle is recommended for IM and SC injections?

A 23–25 gauge, 5/8" needle should be used for SC injections, and a 22–25 gauge, 1–1½" needle should be used for IM injections.

#### Which specific vaccines are recommended for my clinic or hospital staff and how often should they be given?

Health care workers are generally considered to be at significant risk for acquiring and transmitting hepatitis B, influenza, measles, mumps, rubella, and varicella. Staff who were born in 1957 or later should have received two doses of MMR or have laboratory evidence of immunity. All health care workers should have a history of varicella or receive the vaccine. Influenza vaccination should be given annually to all health care workers, and three doses of hepatitis B vaccine should be given to any health care worker who has a risk of exposure to blood. For their personal protection, they should also have completed a series of tetanus-diphtheria toxoids (Td) and have a booster dose within the preceding ten years.

#### What are Vaccine Information Statements and who must receive them?

The National Childhood Vaccine Injury Act was enacted in 1986. The Act requires that all providers give Vaccine Information Statements (VISs) to the adult vaccinee or, in the case of a minor, to the parent or legal representative, prior to administering each dose of each covered vaccine. The vaccines adults may need that are covered by the Act include diphtheria, tetanus, measles, mumps, rubella, polio, hepatitis B, and varicella.

#### Where do I obtain current versions of the VISs?

You can obtain the current versions of the VISs from CDC's website at [www.cdc.gov/nip/publications/vis](http://www.cdc.gov/nip/publications/vis) or from your state health department. The VISs, some in 28 languages, are also available on the Immunization Action Coalition (IAC) website at [www.immunize.org/vis](http://www.immunize.org/vis)

#### Who is responsible for issuing vaccine recommendations for adults in the U.S.?

Recommendations for vaccination of adults in the U.S. are issued by the Centers for Disease Control and Prevention's Advisory Committee on Immunization Practices (ACIP), the American Academy of Family Physicians, and the American College of Physicians. These groups consult with each other, so recommendations from each group are usually very similar.

#### Can I use standing orders for vaccine administration in my practice?

Standing orders programs authorize nurses to administer vaccinations according to an institution- or physician-approved protocol without the need for a physician's examination or direct order. Several studies have shown improved influenza and pneumococcal vaccination rates through standing orders programs. Based on the strength of available evidence, ACIP recommends the use of standing orders programs in both outpatient and inpatient settings.

*Editor's note: On pages 8 and 9 you will find suggested protocols for a standing orders policy for administering influenza and hepatitis B vaccine.*

#### Which vaccines should be given before one becomes pregnant? Which vaccines may be given during pregnancy?

Women who intend to become pregnant should have documentation of immunity (either vaccina-

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### Immunization questions?

- Email [nipinfo@cdc.gov](mailto:nipinfo@cdc.gov)
- Call CDC's Immunization Information Hotline at (800) 232-2522
- Call your state health department

## VACCINATE WOMEN

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The Immunization Action Coalition, 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 for all children 0–18 years; 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.

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tion or serology) to tetanus, diphtheria, measles, mumps, rubella, and varicella. A history of chickenpox is considered adequate evidence of varicella immunity. Hepatitis B immunity is also recommended for women with occupational or behavioral risk factors for hepatitis B virus infection. Verification of rubella immunity is particularly important for women born outside the U.S. where rubella vaccine may not be part of routine childhood immunization. Live virus vaccines (MMR and varicella) should not be given to a woman known to be pregnant or planning to become pregnant in the next month. Adult tetanus-diphtheria toxoids (Td) and other inactivated vaccines such as hepatitis B, hepatitis A, influenza, pneumococcal polysaccharide, meningococcal, and polio, may be administered to pregnant women if indicated. Influenza vaccine is recommended for women who will be in the second or third trimester of pregnancy during influenza season (December through March).

#### **If a pregnant woman with no history of varicella disease is exposed to varicella, what should be done?**

Pregnant women should never be given varicella vaccine. If a susceptible pregnant woman has a substantial exposure to varicella, the use of varicella zoster immune globulin (VZIG) should be strongly considered. Details on the use of VZIG may be found in the 1996 varicella ACIP statement at [www.cdc.gov/mmwr/preview/mmwrhtml/00042990.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/00042990.htm).

#### **Can FluMist (the new intranasal influenza vaccine) be given to pregnant women?**

Since FluMist is a live virus vaccine, it cannot be given to pregnant women (they should be given inactivated vaccine). FluMist is indicated only for healthy persons ages 5–49 years who have no contraindications.

## Hepatitis B questions

by Linda Moyer, RN, and Eric Mast, MD

#### **If a year has elapsed since the first dose of hepatitis B vaccine, do I need to start the series over?**

No, there is no need to restart the series. Resume vaccination from the point that the series was interrupted.

#### **For whom is hepatitis B vaccine recommended?**

A complete list of adults in whom hepatitis B vaccination is recommended can be found in "Standing Orders for Administering Hepatitis B Vaccine to Adults" on page 8. Hepatitis B vaccine is also recommended for all children and teens 0 through 18 years of age.

#### **Who needs postvaccination testing after receiving hepatitis B vaccine?**

Knowledge of response to vaccination is important for the following groups:

- Immunocompromised persons (e.g., chronic hemodialysis patients, HIV-infected persons)
- Infants born to hepatitis B surface antigen-positive (HBsAg+) mothers
- Health care workers (HCWs) who have contact with blood
- Sex partners of persons with chronic hepatitis B virus (HBV) infection
- Persons who received the vaccine in the buttock (This is not a recommended site for any vaccine.)

#### **When, how, and how often should I test vaccinated HCWs to be sure they're immune to hepatitis B?**

All HCWs who have the potential for blood exposure should have postvaccination testing (anti-HBs) 1–2 months after the hepatitis B vaccine series is completed. A protective antibody response is  $\geq 10$  mIU/mL. Periodic testing or periodic boosting is not necessary for immunocompetent health care workers who have developed a protective antibody response.

#### **If a HCW had 3 doses of hepatitis B vaccine but never had postvaccination testing, should I test them now?**

No. A HCW does not need to be tested unless s/he has an exposure to blood that contains or might contain HBV. If an exposure occurs, refer to the 2001 ACIP recommendations for hepatitis B postexposure prophylaxis at [www.cdc.gov/mmwr/preview/wrhtml/rr5011a1.htm](http://www.cdc.gov/mmwr/preview/wrhtml/rr5011a1.htm).

#### **Before reading the ACIP recommendations that say not to do this, we tested our employees for hepatitis B immunity (anti-HBs) and some were not immune, even though they had all completed a 3-dose series. What should we do now?**

These persons might have just lost detectable anti-HBs over time, but are still protected. You can either follow the answer to the previous question or give one dose of vaccine, test in 1 month, and if anti-HBs is adequate ( $\geq 10$  mIU/mL), nothing further needs to be done. If anti-HBs is  $< 10$  mIU/mL, complete the second series, test 1–2 months after the last dose, and record the result in the person's health record.

#### **How effective are we in achieving the national recommendation for universal HBsAg testing for pregnant women?**

Although individual state HBsAg screening rates might vary, approximately 95% of pregnant women in the United States overall receive screening for HBsAg. ACOG, ACIP, AAP, AAFP, and the Centers for Disease Control and Prevention recommend routine HBsAg screening of pregnant women.

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

# IAC welcomes Advisory Board liaisons

The Immunization Action Coalition has restructured its Advisory Board to include both liaisons from organizations as well as individuals. It is inspiring to have such a strong group of committed experts from throughout the immunization community help us carry out our mission to increase immunization rates and prevent disease.

We are delighted to have the following organizations as partners in the Coalition's work:

- ◆ American Academy of Pediatrics
- ◆ American College of Obstetricians and Gynecologists
- ◆ American College of Physicians
- ◆ American Medical Association
- ◆ American Nurses Association
- ◆ American Pharmacists Association
- ◆ Children's Vaccine Program at PATH
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- ◆ National Vaccine Program Office
- ◆ Office of the Associate Director for Minority Health, CDC
- ◆ Pediatric Infectious Diseases Society
- ◆ Vaccine Education Center, Children's Hospital of Philadelphia

We warmly welcome the following seven new liaison members to IAC's Advisory Board:

**Dennis A. Brooks, MD, MPH, MBA**  
*National Medical Association (NMA)*

Dr. Brooks is Assistant Professor of Pediatrics at Johns Hopkins School of Medicine. He has done research on the use of immunization registries, working with both CDC and the National Vaccine Advisory Committee. At NMA, he is Director of Research for the Pediatric Section. Dr. Brooks also serves on CDC's Advisory Committee on Immunization Practices (ACIP).

**Louis Z. Cooper, MD, FAAP**

*Nat'l Network for Immunization Information (NNii)*  
Dr. Cooper is Professor of Pediatrics, Columbia University, and emeritus Chair of Pediatrics at St. Luke's-Roosevelt Hospital Center in New York City. He served as President of the American Academy of Pediatrics (AAP) during 2001-2002 and is currently the Interim Executive Director of NNii.

**Mark A. Kane, MD, MPH**

*Children's Vaccine Program at PATH (Program for Appropriate Technology in Health)*

Dr. Kane, pediatrician, is Director of the Children's Vaccine Program (CVP) at PATH, whose mission is to improve immunization rates of children in the developing world. Dr. Kane completed a three-year term as a Global Alliance for Vaccines and Immunization (GAVI) Board member and continues to serve as a member of the GAVI Working Group.

**Kathleen M. Neuzil, MD, MPH**

*American College of Physicians (ACP)*

Dr. Neuzil is Assistant Professor of Medicine, Division of Infectious Diseases, University of Washington School of Medicine, and Staff Physician and Hospital Epidemiologist, Veterans Affairs Puget Sound Health Care System, Seattle. She is a member of ACP's Adult Immunization Initiative Physician Advisory Board and is ACP's liaison representative to ACIP.

**Walter A. Orenstein, MD**

*National Immunization Program (NIP), CDC*

Dr. Orenstein, pediatric infectious disease specialist, has been Director of CDC's National Immunization Program since 1993, and for five years prior, was Director of CDC's Division of Immunization. He serves on the National Vaccine Advisory Committee and AAP's Committee on Infectious Diseases. He is Chairman of the Technical Consultative Group on the Global Eradication of Poliomyelitis of WHO's Expanded Program on Immunization and is the co-editor of the third edition of the textbook *Vaccines*.

**Mitchel C. Rothholz, RPh**

*American Pharmacists Association (APhA)*

Mr. Rothholz, pharmacist, is Vice President for Professional Practice of APhA. He is responsible for APhA's academies, practice and career development activities, immunization and other public health initiatives, awards and election processes. He is an active member of numerous state and national pharmacy organizations.

**Litjen Tan, PhD**

*American Medical Association (AMA)*

Dr. Tan is Director, Infectious Disease, Immunology, and Molecular Medicine at AMA. He is responsible for all scientific and policy issues that pertain to infectious diseases and ensures that AMA remains abreast of critical happenings in infectious diseases. He has been active in issues pertaining to vaccine safety, vaccine accessibility for children and adults, increasing vaccination coverage, and reaching out to high-risk groups. Dr. Tan is AMA's liaison representative to ACIP.

Brief biosketches of all Advisory Board members are found on the Web at [www.immunize.org/genr.d/advbd.htm](http://www.immunize.org/genr.d/advbd.htm)

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# States Report Hundreds of Medical Errors in Perinatal Hepatitis B Prevention

## *Avoid tragic mistakes—vaccinate newborns against HBV in the hospital*

By Teresa A. Anderson, DDS, MPH, and Deborah L. Wexler, MD\*

On two annual surveys conducted by the Immunization Action Coalition covering the period from July 1999 to October 2002, state and local hepatitis coordinators reported more than 500 medical errors regarding perinatal hepatitis B prevention. Examples of types of errors included:

- not properly prophylaxing infants born to HBsAg-positive mothers with both hepatitis B vaccine and HBIG within 12 hours of birth
- not giving hepatitis B vaccine to infants born to mothers of unknown HBsAg status within 12 hours of birth
- misinterpreting or mistranscribing hepatitis B screening test results, or failing to communicate results to or within the hospital
- ordering the wrong hepatitis B screening test

Because of these types of errors, many children are now chronically infected with hepatitis B virus (HBV) and at least one infant has died. Children infected when less than one year of age have a 90% chance of developing chronic HBV infection with all its serious potential sequelae such as cirrhosis and liver cancer.

Consider the following examples reported by the nation's hepatitis coordinators where infants were needlessly put at risk for perinatal HBV infection.

### **Medical Error Type #1: Infants born to HBsAg-positive mothers who did not receive both hepatitis B vaccine and HBIG within 12 hours of birth.**

*Recommendation of ACIP, ACOG, AAP, and AAFP: All infants of HBsAg-positive mothers (including premies) should receive hepatitis B vaccine and HBIG within 12 hours of birth.*

Case report examples:

- “The mother had been diagnosed with chronic hepatitis B in 1994. In her prenatal record she was documented to be HBsAg and HBeAg positive, and this information appeared in several places on the record that was sent to the hospital. Despite this, her baby did not receive HBIG or the first dose of hepatitis B vaccine in the hospital. In fact, the hepatitis B vaccine order was crossed out in the infant's chart. Follow-up with the pediatrician on day six indicated that the baby still had not received any prophylaxis. The first dose of vaccine was given when the infant was three weeks of age, the sec-

ond three months after the first, and the third six months after the first. The child's current status is unfortunate. Diagnosed HBsAg-positive at 19 months of age, the child is now being followed by a liver specialist for chronic hepatitis B.”

- “We have two cases where infants born to carrier mothers received the first dose of hepatitis B vaccine three weeks after birth and no HBIG. In one of the cases, a resident interviewed the mother who claimed she was not HBsAg positive.”
- “In 2000, we had 25 cases where the babies of positive moms did not receive HBIG at birth. Three of these babies are now infected. In one of the cases, the mother's status was erroneously marked as unknown, another was marked as negative, and in one the status was correctly marked, but the HBIG was still not given.”
- “In 2000, there were eight infants of HBsAg-positive mothers who never received HBIG and six who did not get hepatitis B vaccine within 12 hours of birth. This is despite letters to the hospital and to the OB/GYN prior to the birth.”
- “In one case in a rural hospital, the mother's positive hepatitis B status was documented in her chart and the infant's chart, which was seen by many nurses and three pediatricians, but no prophylaxis was ever initiated.”
- “For 1999 and 2000, of the 771 infants born to HBsAg-positive women in our state, 30 did not receive HBIG at birth, 10 did not receive the first dose of vaccine, and 9 didn't receive either.”

### **Medical Error Type #2: Infants born to mothers of unknown HBsAg status who were not properly prophylaxed.**

*Recommendation of ACIP, AAP, AAFP, and ACOG: If the mother's HBsAg status is unknown, infants must receive hepatitis B vaccine within 12 hours of birth. For premies weighing <2kg, HBIG is also given. [Authors' note: It's not recommended to wait for the HBsAg lab result to determine your course of action. Order hepatitis B vaccine from the pharmacy and give it immediately—within 12 hours of birth.]*

Case report examples:

- “The mother's positive lab result was not received before she was discharged, and the hospital had not re-instituted the birth dose. The infant did not receive HBIG or the first dose of vaccine within the recommended time frame.”

- “During a hospital audit, I found one case where the vaccine had been withheld for 25 hours while the staff awaited the results of the ‘stat’ HBsAg blood work on a mother of unknown status.”
- “In one case a mother came in with no prenatal care. The intern did not think she *looked* high risk. She turned out positive. Her child did not receive vaccine.”
- “The mother was known to be HBsAg positive with a previous pregnancy; however, with this pregnancy the woman did not receive prenatal care and reported to a different hospital in active labor. HBIG and hepatitis B vaccine were not given until two days after birth when the mother was found to be HBsAg positive.”
- “The mother's status was unknown at birth. She left the hospital without the baby being vaccinated. She gave a fictitious address.”
- “This mom had no prenatal care, knew she was a carrier, but gave no indication of her HBsAg status when admitted. The hospital ran tests on mom at delivery, but it wasn't until two days later when the lab results came back positive that the baby was treated with HBIG and hepatitis B vaccine.”
- “My survey found 36 women unscreened in a six-month period. Ten infants did not get vaccine.”

### **Medical Error Type #3: Screening test results that were misordered, misinterpreted, mistranscribed, or miscommunicated.**

*[Authors' note: To avoid these types of errors, IAC recommends that a copy of the mother's original HBsAg lab report be sent to the birthing hospital as part of the prenatal record. Labor and delivery units and nursery units should carefully review this original lab report to determine the appropriate course of action.]*

Case report examples:

- “We had a mom who was reported to the hospital as HBsAg negative by the prenatal care provider. Unfortunately, this woman was actually HBsAg positive. The baby did not receive HBIG or the birth dose of hepatitis B vaccine, and by three months of age developed fulminant hepatitis B and died.”
- “In June 2002, a situation occurred where an infant born to an HBsAg-positive mother at a large teaching hospital was not appropriately

treated with hepatitis B vaccine and HBIG at birth. A full investigation was launched, and it was found that although the mother's HBsAg status was clearly marked on the prenatal record as 'reactive,' a resident at the hospital mistranscribed the mother's HBsAg status onto the hospital chart as 'negative.'"

- "On an average, we receive ten newborn screening forms each month that indicate a misinterpreted or mistranscribed maternal hepatitis B status."
- "We find that doctors' offices sometimes have a positive result in the mother's chart and neglect to look at it. Or they order labs and neglect to notice that they were never drawn."
- "Three infants were born to HBsAg-positive mothers where the hospital record erroneously indicated that the mothers were negative for HBsAg. The babies were not prophylaxed within 12 hours with HBIG and hepatitis B vaccine."
- "In two cases, the mothers were tested prenatally and the mothers' charts showed positive HBsAg test results. However, the HBsAg test result was documented as negative in the infants' charts, resulting in neither HBIG nor hepatitis B vaccine being given. In two other cases, the positive results were transcribed incorrectly in the mothers' charts as negative."
- "The hospital nursery claimed they had a record of the mother being HBsAg negative. The baby was not immunized at time of birth, although the health department had a copy of the lab slip indicating that mom was HBsAg positive. The OB's office claimed that they did not have this lab slip in the patient's chart but later confirmed that mom was HBsAg positive."
- "We have two cases due to transcription error. The children are now positive."
- "Concerning an HBsAg-positive mom, I was told by both the doctor and nurse that this meant that the woman had hepatitis B antibodies."
- "The physician's interpretation of a mother's prenatal HBsAg-positive lab was 'hepatitis B negative.' This infant was not given HBIG or vaccine prior to hospital discharge. The hospital records recorded the physician's interpretation of the lab rather than the actual lab results. This child is now HBsAg positive."

#### Medical Error Type #4: Pregnant women screened with the wrong hepatitis B test.

*Recommendation of ACIP, ACOG, AAP, and AAFP: The hepatitis B screening test to order for each and every pregnancy is HBsAg (hepatitis B surface antigen). [Authors' note: The standard screening test is NOT antibody to hepatitis B surface antigen (anti-HBs or HBsAb), antibody to hepatitis B core antigen (anti-HBc or HBcAb), HBsAg, anti-HBe, or HBV-DNA. These tests are*

*easily confused and often misordered since some differ only by a single letter. Ordering the wrong lab test can be a fatal error.]*

Case report examples:

- "We have examples of approximately 25 such cases: we ask for copies of the labs and we find that anti-HBs has been frequently ordered."
- "We get reports of the wrong screening test ordered, including HBcAb and HBV-DNA."
- "Two maternal records were found to have anti-HBc documented instead of HBsAg. In one hospital, cord blood was used to test mother's HBsAg status."
- "We see anti-HBs erroneously ordered in clinics and hospitals for unscreened women. We also see HBsAg ordered correctly in the hospitals but sent to the labs requesting an anti-HBs test. These appear to be errors and lack of knowledge on the part of the physicians and other hospital staff. Most disturbing is that it has never been noticed by the physicians, lab staff, or nursing staff until it is brought to their attention by health department staff. We also see physicians who only order HBsAg screening for the first pregnancy and none of the following pregnancies, and also those who order only anti-HBs when their patient has had the vaccine series."

#### Conclusion

As these examples demonstrate, medical errors in perinatal hepatitis B prevention can occur at any time—beginning with the woman's first prenatal visit and extending beyond the mother's and infant's hospital discharge. The errors described in this article are only the "tip of the iceberg." Most errors remain undiscovered. CDC estimates that annually about 2,000 infants are born to unidentified HBsAg-positive women and approximately 10,000 HBsAg-positive women are not reported to their state's perinatal hepatitis B program and therefore do not benefit from case management.

Errors are made by a broad range of perinatal health care workers including obstetricians, family physicians, pediatricians, nurses, lab technicians, and clerical staff, and these errors occur in hospitals as well as primary care settings. While you may be following the national recommendations for the patients under your care, you can't be certain about everyone else. Human error will never be eliminated.

Only a universal hepatitis B vaccine birth dose policy in every hospital will optimize the protection of all infants from human error and chronic HBV infection. If your hospital isn't vaccinating every infant against hepatitis B virus infection prior to discharge, IAC urges you to work together with your hospital, your medical staff, and your local and/or state health departments to institute this lifesaving policy in your hospital. The words

of one hepatitis coordinator (whose state experienced an infant death from fulminant hepatitis B) make the case for this policy: "Life is messy, and giving the birth dose is the best way to avoid worst-case scenarios." ♦

*For resources and ideas to help you, including all responses to IAC's 2001 and 2002 birth dose surveys, related journal articles, and more, visit the Immunization Action Coalition's birth dose web pages at: [www.immunize.org/birthdose](http://www.immunize.org/birthdose)*

#### Other Related Resources

"Hospitals and Doctors Sued for Failure to Protect Newborns from Hepatitis B Virus Transmission." Source: Immunization Action Coalition (IAC). [www.immunize.org/catg.d/p2061.pdf](http://www.immunize.org/catg.d/p2061.pdf)

"Labor & Delivery and Nursery Unit Guidelines to Prevent Hepatitis B Virus Transmission." Source: IAC. [www.immunize.org/catg.d/p2130.htm](http://www.immunize.org/catg.d/p2130.htm)

"Give the Birth Dose... Hepatitis B Vaccine at Birth Saves Lives!" Source: IAC. [www.immunize.org/catg.d/p2125.htm](http://www.immunize.org/catg.d/p2125.htm)

"Recommended Childhood Immunization Schedule." Source: ACIP, AAP, AAFP. [www.cdc.gov/nip/recs/child-schedule.pdf](http://www.cdc.gov/nip/recs/child-schedule.pdf)

"General Recommendations on Immunization" Source: *MMWR*, 2/8/02, Vol. 51(RR02):1-36. [www.cdc.gov/mmwr/preview/mmwrhtml/rr5102a1.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5102a1.htm)

"Thimerosal in Vaccines—Joint Statement of the AAFP, AAP, ACIP, and PHS" Source: *MMWR*, 7/14/00, Vol. 49(27):622-631. [www.aap.org/policy/jointthim.html](http://www.aap.org/policy/jointthim.html)

*\*Teresa Asper Anderson, DDS, MPH, has worked in public health for 25 years, first as a dentist for low-income children and then as an epidemiologist consultant, specializing in immunization issues. Dr. Anderson coordinated the Immunization Action Coalition's 2001 and 2002 birth dose surveys and has presented the results at national conferences.*

*Deborah L. Wexler, MD, a board-certified family physician, is the founder and executive director of the Immunization Action Coalition (IAC). The Coalition provides practical immunization education materials to health professionals and patients. IAC promotes the recommendation to give hepatitis B vaccine to every newborn no later than hospital discharge.*

**What should be done for pregnant women who arrive at the hospital without an HBsAg test result immediately available (and later for their newborns)?**

Infants born to women who lack an HBsAg test result at the time of delivery should receive the first dose of hepatitis B vaccine within 12 hours of birth. HBsAg testing of women with unknown status should be performed ASAP following hospital admission. Women without prenatal care are more likely to be HBsAg-positive than women who receive prenatal care, underscoring the importance of timely vaccination for their infants. If, upon testing, the mother is found to be HBsAg-positive, her infant should receive the additional protection of HBIG as soon as possible but not more than 7 days after birth. Premature infants less than 2kg at birth, who are born to women of unknown HBsAg status, should be given HBIG, in addition to hepatitis B vaccine within 12 hours of birth.

**Why are all newborns recommended to receive hepatitis B vaccine prior to hospital discharge?**

ACOG, ACIP, AAP, and AAFP recommend that all newborns receive the first dose of hepatitis B vaccine soon after birth and before hospital discharge. The first dose also may be given by age 2 months, but only if the infant's mother is assured to be HBsAg-negative. The birth dose, however, is the preferred schedule for all infants in order to 1) safeguard against maternal hepatitis B testing errors and test reporting errors, 2) protect infants discharged to households in which persons with chronic HBV infection other than the mother might reside, and to 3) enhance completion of the childhood immunization series.

**Hepatitis A questions**

by Linda Moyer, RN, and Eric Mast, MD

**Which of my patients should be vaccinated for hepatitis A?**

Vaccine is recommended for the following persons 2 years of age and older:

- Travelers to countries with increased rates of hepatitis A
- Men who have sex with men
- Injecting and non-injecting illegal drug users
- Persons with clotting-factor disorders (e.g., hemophilia)
- Persons with chronic liver disease
- Children living in areas with increased rates of hepatitis A during the baseline period from 1987-1997 (for details, go to the 1999 ACIP hepatitis A recommendations at [www.cdc.gov/mmwr/preview/mmwrhtml/rr4812a1.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/rr4812a1.htm))
- Persons who work with hepatitis A virus (HAV)-infected primates or with HAV in a research laboratory setting

**How do I interpret some of the common hepatitis B panel results?**

Tests	Results	Interpretation
HBsAg anti-HBc anti-HBs	negative negative negative	susceptible
HBsAg anti-HBc anti-HBs	negative negative positive (≥10mIU/mL)*	immune due to vaccination
HBsAg anti-HBc anti-HBs	negative positive positive	immune due to natural infection
HBsAg anti-HBc IgM anti-HBc anti-HBs	positive positive positive negative	acutely infected
HBsAg anti-HBc IgM anti-HBc anti-HBs	positive positive negative negative	chronically infected
HBsAg anti-HBc anti-HBs	negative positive negative	four interpretations possible†

\*Postvaccination testing, when it is recommended, should be performed 1-2 mos following the last dose of hepatitis B vaccine.

- †1. May be recovering from acute HBV infection.  
 2. May be distantly immune, and the test is not 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.

**For which destinations outside of the U.S. should people be vaccinated against hepatitis A?**

Hepatitis A vaccine is recommended for all susceptible persons 2 years of age and older who travel outside the U.S. (except travel to Western Europe, New Zealand, Australia, Canada, and Japan). Protection against HAV can be provided either by short-term immunization with immune globulin (IG), particularly if travel is less than 4 weeks away, or long-term immunization with hepatitis A vaccine. (Data are not available regarding the risk for hepatitis A for persons traveling to developed areas of the Caribbean; however, vaccine should be considered if travel will be in areas where poor sanitation is anticipated.)

**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, or vaccine-induced immunity.

**IgM anti-HAV:** *IgM antibody subclass of anti-HAV.* Its presence indicates a recent infection with HAV. 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:** *Antibody to hepatitis B core antigen* is a 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 (≤6 mos). Its presence indicates acute infection.

**IgG anti-HBc:** *IgG antibody subclass of anti-HBc* is a marker of past or current infection with HBV. If it and HBsAg are both positive (in the absence of IgM anti-HBc), this indicates chronic HBV 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.

# How to Administer IM and SC Injections to Adults

## For Intramuscular (IM) Injections

### Vaccines administered via IM route:

Tetanus-diphtheria (Td), hepatitis A, hepatitis B, and inactivated influenza are given IM. PPV23 may be given either IM or SC.

### Injection site:

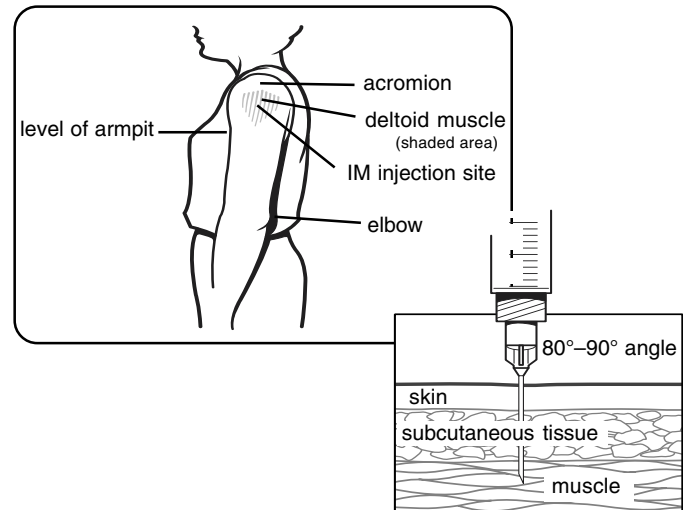
Give in the thickest and central portion of the deltoid—above the level of the armpit and below the acromion (see the diagram).

### Needle size:

22–25 gauge, 1" to 1-1/2" needle

### Needle insertion:

- Use a needle long enough to reach deep into the muscle.
- Insert the needle at an 80°–90° angle to the skin with a quick thrust.
- Two injections given in the same deltoid muscle should be separated by a minimum of 1", if possible.



## For Subcutaneous (SC) Injections

### Vaccines administered via SC route:

MMR, varicella, and meningococcal vaccines are given SC. PPV23 may be given either SC or IM.

### Injection site:

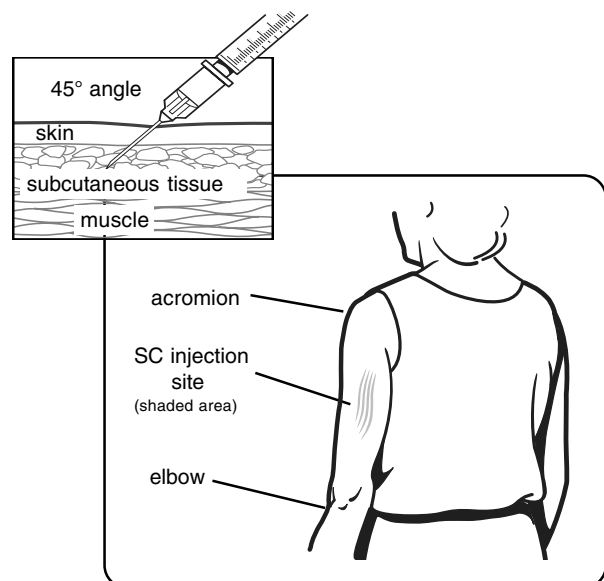
Posterolateral aspect of upper arm

### Needle size:

23–25 gauge, 5/8" needle

### Needle insertion:

- Pinch up on the tissue to prevent injection into muscle. Insert the needle at a 45° angle to the skin.
- Two injections given in the same area of fatty tissue should be given a minimum of 1" apart.



Adapted by the Immunization Action Coalition, courtesy of the Minnesota Department of Health

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# Standing Orders for Administering Hepatitis B Vaccine to Adults

**Purpose:** To reduce morbidity and mortality from hepatitis B virus (HBV) infection by vaccinating all patients who meet the criteria established by the Centers for Disease Control and Prevention's Advisory Committee on Immunization Practices.

**Policy:** Under these standing orders, eligible nurses may vaccinate patients who meet the criteria below.

**Procedure:**

1. Identify adults in need of hepatitis B vaccination based on the following criteria:
  - a. Persons less than 19 years of age who have not received the vaccine
  - b. Age 19 years or older meeting any of the following criteria:
    - having had more than one sex partner in the previous 6 months, a recently acquired sexually transmitted disease, or recent treatment for a sexually transmitted disease
    - male who has had sex with males
    - injection drug user
    - sex partner or household member of a person who is chronically infected with HBV (including an HBsAg-positive adopted child)
    - at occupational risk of infection through exposure to blood or blood-contaminated body fluid (e.g., health care worker, public safety worker, trainee in a health professional or allied health school)
    - client or staff of an institution for the developmentally disabled
    - hemodialysis patient or patient with early renal failure (who will become a dialysis patient)
    - receiving clotting-factor concentrate
    - planning to travel to or live in a high endemic area of the world for more than 6 months and will have close contact with the local population; also short-term travelers who are likely to have contact with blood (e.g., in a medical setting) or sexual contact with residents of areas with high or intermediate levels of endemic disease
    - housed in a long-term correctional facility
2. Screen all patients for contraindications and precautions to hepatitis B vaccine:
  - a. **Contraindications:** a history of a serious reaction (e.g., anaphylaxis) after a previous dose of hepatitis B vaccine or to a hepatitis B vaccine component
  - b. **Precautions:** a moderate or severe acute illness with or without fever
3. Provide all patients with a copy of the most current federal Vaccine Information Statement (VIS). You must document, in the patient's medical record or office log, the publication date of the VIS and the date it was given to the patient. Provide non-English speakers with the VIS in their native language if available; these can be found at [www.immunize.org/vis](http://www.immunize.org/vis)
4. For persons 20 years of age or older, administer 1.0 mL hepatitis B vaccine IM (22-25g, 1-1½" needle) in the deltoid muscle. For persons 19 years of age or younger, administer 0.5 mL hepatitis B vaccine IM (22-25g, 1-1½" needle) in the deltoid muscle.
5. Provide subsequent doses of hepatitis B vaccine to complete each patient's 3-dose schedule by observing a minimum interval of 4 weeks between the first and second doses, 8 weeks between the second and third doses, and at least 4 months between the first and third doses.
6. Document each patient's vaccine administration information and follow up in the following places:
  - a. **Medical chart:** Record the date the vaccine was administered, the manufacturer and lot number, the vaccination site and route, and the name and title of the person administering the vaccine. If vaccine was not given, record the reason(s) for non-receipt of the vaccine (e.g., medical contraindication, patient refusal).
  - b. **Personal immunization record card:** Record the date of vaccination and the name/location of the administering clinic.
7. Be prepared for management of a medical emergency related to the administration of vaccine by having a written emergency medical protocol available, as well as equipment and medications.
8. Report all adverse reactions to hepatitis B vaccine to the federal Vaccine Adverse Event Reporting System (VAERS) at [www.vaers.org](http://www.vaers.org) or by calling (800) 822-7967. VAERS report forms are available at [www.vaers.org](http://www.vaers.org)

This policy and procedure shall remain in effect for all patients of the \_\_\_\_\_ until rescinded or until \_\_\_\_\_ (date). (name of practice or clinic)

Medical Director's signature: \_\_\_\_\_ Effective date: \_\_\_\_\_



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# Standing Orders for Administering Influenza Vaccine to Adults

**Purpose:** To reduce morbidity and mortality from influenza by vaccinating all patients who meet the criteria established by the Centers for Disease Control and Prevention’s Advisory Committee on Immunization Practices.

**Policy:** Under these standing orders, eligible nurses may vaccinate patients who meet the criteria below.

**Procedure:**

1. Identify adults in need of influenza vaccination based on the following criteria:
  - a. Age 50 years or older
  - b. Age less than 50 years with any of the following conditions:
    - chronic disorder of the pulmonary or cardiovascular system, including asthma
    - chronic metabolic disease (e.g., diabetes mellitus), renal dysfunction, hemoglobinopathy, or immunosuppression (e.g., caused by medications, HIV) that has required regular medical follow-up or hospitalization during the preceding year
    - will be in the second or third trimester of pregnancy during the influenza season
  - c. Residence in a nursing home or other chronic-care facility that houses persons of any age who have chronic medical conditions
  - d. In an occupation or living situation that puts one in proximity to persons at high risk, including:
    - a health care worker, caregiver, or household member in contact with person(s) at high risk of developing complications from influenza
    - a household contact or out-of-home caretaker of a child 0–23 months of age
  - e. Wish to reduce the likelihood of becoming ill with influenza
2. Screen all patients for contraindications and precautions to influenza vaccine:
  - a. **Contraindications:** serious reaction (e.g., anaphylaxis) after ingesting eggs or after receiving a previous dose of influenza vaccine or an influenza vaccine component. Do not give live attenuated influenza vaccine (LAIV) to pregnant women, immunosuppressed persons, or persons with close contact with immunosuppressed persons (e.g., health care workers or household contacts).
  - b. **Precautions:** moderate or severe acute illness with or without fever
3. Provide all patients with a copy of the most current federal Vaccine Information Statement (VIS). You should document, in the patient’s medical record or office log, the publication date of the VIS and the date it was given to the patient. Provide non-English speakers with a VIS in their native language if available; these can be found at [www.immunize.org/vis](http://www.immunize.org/vis)
4. Administer 0.5 mL inactivated influenza vaccine IM (22-25g, 1–1½" needle) in the deltoid muscle. Alternatively, healthy persons 5–49 years of age without contraindications may be given 0.5 mL of LAIV; 0.25 mL is sprayed into each nostril while the patient is in an upright position.
5. Document each patient’s vaccine administration information and follow up in the following places:
  - a. **Medical chart:** Record the date the vaccine was administered, the manufacturer and lot number, the vaccination site and route, and the name and title of the person administering the vaccine. If vaccine was not given, record the reason(s) for non-receipt of the vaccine (e.g., medical contraindication, patient refusal).
  - b. **Personal immunization record card:** Record the date of vaccination and the name/location of the administering clinic.
6. Be prepared for management of a medical emergency related to the administration of vaccine by having a written emergency medical protocol available, as well as equipment and medications.
7. Report all adverse reactions to influenza vaccine to the federal Vaccine Adverse Event Reporting System (VAERS) at [www.vaers.org](http://www.vaers.org) or (800) 822-7967. VAERS report forms are available at [www.vaers.org](http://www.vaers.org)

This policy and procedure shall remain in effect for all patients of the \_\_\_\_\_ until rescinded or until \_\_\_\_\_ (date).  
(name of practice or clinic)

Medical Director’s signature: \_\_\_\_\_ Effective date: \_\_\_\_\_

# 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, 2001**

Every medical practice that delivers vaccination services should regularly use this 35-minute video for training and skills-checking of staff who administer vaccines. Each video comes with presenter's notes and a skills checklist.

**Cost is \$15 per copy. For 11 or more copies,  
contact us for discount pricing.**

**Call (651) 647-9009 or email  
admin@immunize.org**

**For more information or to order online,  
visit [www.immunize.org/iztech](http://www.immunize.org/iztech)**

**To order by fax or mail, use the order form  
on the next page.**

## Visit IAC websites

[www.immunize.org](http://www.immunize.org)

[www.vaccineinformation.org](http://www.vaccineinformation.org)

[www.hepprograms.org](http://www.hepprograms.org)

[www.izcoalitions.org](http://www.izcoalitions.org)

## Immunization record cards for adults!



Give all your adult patients a permanent vaccination record card from IAC. With this card, they'll always know their vaccination status—and next-dose due dates.

The bright canary-yellow card comes pre-folded to fit in a wallet alongside other important cards. Printed on rip-proof, smudge-proof, water-proof paper, it's meant to last.

**To order, visit [www.immunize.org/adultizcards](http://www.immunize.org/adultizcards)  
or see the order form on the next page.**

**(To receive sample cards, email your request to [admin@immunize.org](mailto:admin@immunize.org))**



# Seize the Day: Get Ready for Influenza Vaccination Season NOW!



Deborah L. Wexler, MD  
IAC Executive Director

Dear Colleagues:

According to an article titled "Vaccination and Perinatal Infection Prevention Practices Among Obstetrician-Gynecologists" published in *Obstetrics and Gynecology* in April, a startlingly low 44% of survey respondents (all were OB/Gyns) offered influenza vaccine to pregnant patients. Progress has been slow: the CDC recommendation to vaccinate pregnant women has been in place since 1997! We have lots of sleeves to roll up (after we roll up our own) to protect women and their offspring from influenza and its special pregnancy-related complications. Here are five suggestions you

can initiate today that will help you protect your patients and enhance your vaccination practices.

## Get vaccinated, and vaccinate your staff

A top priority should be vaccinating your clinic staff against influenza. CDC estimates that only one-third of U.S. health care workers are vaccinated annually against influenza—a national disgrace. This means two-thirds of health care workers unnecessarily put patients, themselves, and their families at risk for influenza and its complications every year. We need to give our patients quality health care, not influenza.

## Implement standing orders

It is now easier than ever to comply with ACOG and CDC recommendations to give influenza vaccine to all healthy pregnant women who will be in their second or third trimester during influenza season (December through March). Implementing standing orders for influenza immunization is the most practical, timesaving, proactive step you can take to increase vaccination rates in your practice. It allows nurses to assess each patient's need for vaccination based on established criteria and then administer the vaccine without your direct order. Studies have shown that implementing standing orders improves immunization rates and saves practitioner time. CDC recommends the use of standing orders programs in both outpatient and inpatient settings. Sample protocols for standing orders for influenza and hepatitis B vaccine administration are found inside on pages 8 and 9. CDC has reviewed both documents for technical accuracy.

## Use these additional resources

These useful resources will help make your influenza vaccination program a success:

- CDC's National Immunization Information Hotline for health professionals and the public: (800) 232-2522
- CDC's National Immunization Program: [www.cdc.gov/nip/flu](http://www.cdc.gov/nip/flu)
- CDC's 2003-04 Influenza Vaccine Information Statement: [www.cdc.gov/nip/publications/VIS/vis-flu.pdf](http://www.cdc.gov/nip/publications/VIS/vis-flu.pdf)

- CDC's 2003 influenza recommendations: [www.cdc.gov/mmwr/pdf/rr/rr5208.pdf](http://www.cdc.gov/mmwr/pdf/rr/rr5208.pdf)
- Immunization Action Coalition: [www.immunize.org/influenza/index.htm#resources](http://www.immunize.org/influenza/index.htm#resources)

## Order *Immunization Techniques: Safe, Effective, Caring* video

To be 100% sure your staff is fully trained in vaccine administration techniques, follow the path of thousands of others who have ordered *Immunization Techniques: Safe, Effective, Caring*. The State of California Immunization Branch developed it in consultation with a national team of expert technical advisors. The video instructs your staff on administration of intramuscular and subcutaneous vaccines, appropriate needle lengths and injection sites for different vaccines for patients of all ages, and much more. Staff can view it as often as necessary. (I recommend every staff member who administers vaccines view it at least once a year.) Here are three easy ways to order this indispensable \$15 resource:

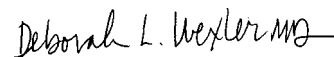
- Online at [www.immunize.org/iztech](http://www.immunize.org/iztech)
- By mail or fax using the Vaccine Resources Order Form on page 11
- By contributing to IAC at a \$60 level (or higher) and receiving the video along with a second video on vaccine handling and storage, as well as a complete packet of camera-ready, copyright-free adult immunization materials, all reviewed by CDC for technical accuracy.

## Order Adult Immunization Record Cards

To increase adult immunization rates, it's important to make it easy for patients to keep track of their immunizations. IAC's adult immunization record card (also reviewed by CDC) lists all the immunizations an adult is likely to need, helping prompt patients to ask for necessary vaccinations. For a description of the attractive, brightly colored card, turn to page 10 or view it online at: [www.immunize.org/adultizcards/pictures.htm](http://www.immunize.org/adultizcards/pictures.htm) We've distributed more than one million cards with tremendously positive feedback. If you would like to sample them, send an email request to [admin@immunize.org](mailto:admin@immunize.org), or order a box of 250. If you're unhappy with them for any reason, we will provide a full refund. Order boxes of cards in either of two ways:

- Online at [www.immunize.org/adultizcards](http://www.immunize.org/adultizcards)
- By mail or fax using the Vaccine Resources Order Form on page 11.

Please implement the five suggestions outlined above to ensure your patients receive protection against influenza. In addition, please consider ordering IAC's many useful resources, as well as making a much-needed contribution so we can continue to help you keep vaccinating women!



Deborah L. Wexler, MD  
Executive Director

## Immunization Action Coalition **VACCINATE WOMEN**

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