

VACCINATE ADULTS!

A bulletin for adult medicine specialists from the Immunization Action Coalition

Highlighting the latest developments in routine adult immunization and chronic hepatitis B virus infection.

Ask the Experts

Editor's note: The Immunization Action Coalition thanks William L. Atkinson, MD, MPH; Andrew T. Kroger, MD, MPH; Eric E. Mast, MD, MPH; and Linda A. Moyer, RN, of the Centers for Disease Control and Prevention (CDC) for answering the following questions for our readers. Dr. Atkinson is a medical epidemiologist, and Dr. Kroger is a medical officer, both at CDC's National Immunization Program. Dr. Mast is chief, Prevention Branch, and Ms. Moyer is an epidemiologist, both at CDC's Division of Viral Hepatitis.

Immunization questions

by William L. Atkinson, MD, MPH, and Andrew T. Kroger, MD, MPH

We've heard that several new vaccine products may be licensed soon. Please tell us more about them.

A second product that combines acellular pertussis vaccine with the adult formulation of tetanus and diphtheria is expected to be licensed in the next several months (see Vaccine Highlights, p. 4). A new combination MMR and varicella vaccine is also expected soon. It is anticipated that the ACIP will discuss the use of these vaccines at its June 29–30 meeting.

Immunization questions?

- Email nipinfo@cdc.gov
- Call your state health dept. (phone numbers at www.immunize.org/coordinators)

What is the difference between the existing meningococcal polysaccharide vaccine (MPSV4) and the new conjugate vaccine (MCV4)?

The new conjugate vaccine is believed to have several advantages over the existing polysaccharide vaccine, such as reduction in bacterial carriage in the nose and throat and longer duration of the following: immunity, induction of immunologic memory, and booster responses. These advantages may result in better herd immunity.

Will MCV4 provide protection against all serogroups?

No. The conjugate vaccine, like the polysaccharide vaccine, contains antigen for serogroups A, C, Y, and W-135. Serogroups C and Y account for about two-thirds of invasive meningococcal disease in the United States. Serogroups A and W-135 are rare in this country. Serogroup B, which accounts for about a third of invasive disease, is not included in the vaccine. Work is underway to develop a vaccine for serogroup B.

How should the MCV4 be administered?

MCV4 should be administered IM, whereas MPSV4 should be given SC.

Who is recommended to receive MCV4?

MCV4 is currently approved by the Food and Drug Administration (FDA) for persons 11–55 years of age (use in younger persons may be approved in the future). Groups for whom ACIP has recently recommended MCV4 include all children at the pre-adolescent visit (11–12 years of age), children entering high school (15 years of age), college freshmen who will be living in a dormitory, and other adolescents who wish to reduce their risk of meningococcal disease. Among high-risk persons in the 11–55 year age range, MCV4 indications are the same as MPSV4 indications: having terminal complement component deficiency and/or asplenia, traveling to areas of the world with high rates of meningococcal disease, working in certain laboratory settings, etc.

Can vaccinations be given without a physician's order?

Vaccines are controlled substances and must always be dispensed with a prescription or order from a physician or other healthcare provider authorized to prescribe medications (such as a nurse practitioner, in some areas). However, there are situations where vaccines can be administered using authorized and signed standing orders. In these situations the physician or other healthcare provider does not need to be physically present for the vaccine to be administered. *Ed. note: for more information on standing orders, see box on p. 2.*

Is it necessary to wear gloves when we administer vaccinations?

No. Gloves are not required when administering vaccinations, unless the person administering the vaccine is likely to come into contact with potentially infectious body fluids or has an open lesion on their hand.

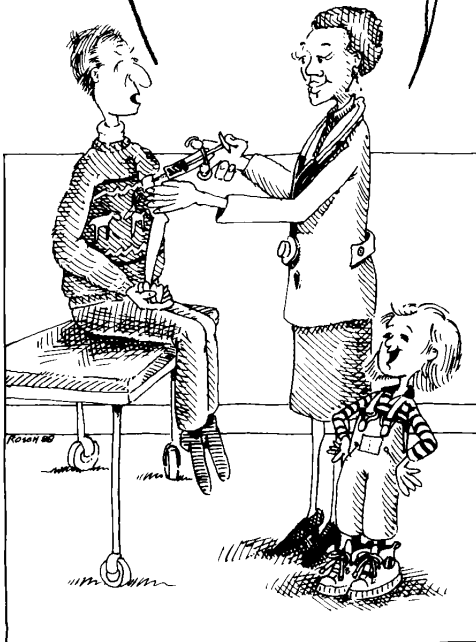
(continued on page 8)

Sign up for IAC Express!

To subscribe, send an email message to express@immunize.org and place the word SUBSCRIBE in the "Subject:" field. You'll receive timely immunization and viral hepatitis news via email on Mondays.

My neighbor had to be revaccinated because vaccine was stored at the wrong temperature.

Don't worry. In our office we follow CDC guidelines for storage and handling of vaccines (which our staff accesses at www2a.cdc.gov/nip/isd/shtoolkit/splash.html). We also use IAC materials such as those located on page 10.



Artwork courtesy of New York State Department of Health

What's Inside?

Ask the Experts	1
Vaccine Highlights	4
Hepatitis B Virus Transmitted in U.S. Long-Term-Care Facilities	5
PPV23: CDC answers your questions	7
Vaccine Storage & Handling: Four resources	10
Immunization Resources Order Form	11
Support IAC Today!	12

Vaccinate Adults!

Immunization Action Coalition Hepatitis B Coalition

1573 Selby Avenue, Suite 234
St. Paul, MN 55104

Phone: (651) 647-9009

Fax: (651) 647-9131

Email: admin@immunize.org

Websites: www.immunize.org

www.vaccineinformation.org

www.hepprograms.org

www.izcoalitions.org

Vaccinate Adults is a semiannual publication of the Immunization Action Coalition (IAC) written for health professionals. All content is reviewed by the Centers for Disease Control and Prevention (CDC) for technical accuracy, with the exception of opinion pieces written by non-CDC authors. This publication is supported by CDC Grant Nos. U66/CCU524042 and U50/CCU523259. The content is solely the responsibility of IAC and does not necessarily represent the official views of CDC. Circulation is approximately 130,000. ISSN 1526-1824.

Publication Staff

Editor: Deborah L. Wexler, MD

Associate Editor: Diane C. Peterson

Managing Editor: Dale Thompson

Editorial Asst.: Janelle Tangonan Anderson

Consultant: Teresa Anderson, DDS, MPH

Layout: Kathy Cohen

IAC Staff

Assistant to the Director: Becky Payne

Office Administrator: Robin VanOss

Administrative Asst.: Susan Broadribb

Website Design: Lantern Web™

IAC Express is IAC's free email news and announcement service. To subscribe, send an email to express@immunize.org with the word SUBSCRIBE in the "Subject" field.

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 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.

Board of Directors

Diane Holmgren

St. Paul Ramsey County Public Health

Anne Kuettel, PHN

St. Paul Ramsey County Public Health

James McCord, MD

Children's Hospitals & Clinics

Cindy Uldrich

United HealthCare

Deborah L. Wexler, MD

Immunization Action Coalition

Want an easy way to stay informed between *Vaccinate Adults* issues?

Subscribe to *IAC Express*, and you'll receive immunization news every week! Visit www.immunize.org/express.

Many health professionals tell us how much they love getting *Vaccinate Adults* in the mail twice a year. As one correspondent wrote, "We think your publication is terrific and always has the latest and greatest news."

Our concern is that the news in *Vaccinate Adults* is only the "latest" as we go to press—by the time our readers receive their copies three weeks later, the immunization world has already changed. For example, we printed the fall issue of *Vaccinate Adults* in September 2004, and distributed it just before the unexpected influenza vaccine shortage was announced. Through no fault of our own, some of the influenza-related material we printed was outdated before the issue was even delivered. We had no way to bring our *Vaccinate Adults* readers up to date, unless they were subscribers to *IAC Express*, our weekly electronic newsletter.

The benefits of a weekly update are many

We were able to keep our *IAC Express* readers fully informed about the rapidly changing vaccine-supply situation as it unfolded. For example, CDC published its "Interim Influenza Vaccine Recommendations, 2004–05 Influenza Season" on October 5, and *IAC Express* reprinted it on October 6, distributing it directly to the email in-boxes of 19,000 subscribers. In October and November alone, *IAC Express* published 12 issues related to the influenza vaccine shortage, bringing readers information about an array of timely CDC resources.

If you aren't an *IAC Express* subscriber, you missed receiving this timely information. You continue to miss receiving the unique range of material covered in *IAC Express*. Subscribers regularly receive news

and information about the following: the latest vaccine recommendations published by CDC; current *MMWR* articles on vaccines and vaccine-preventable diseases; notices of FDA vaccine license approvals; and updates on new immunization resources from CDC and other organizations. *IAC Express* also alerts readers to new and revised IAC print education pieces.

Becoming a subscriber is free and easy

Given the value of a weekly update, we're concerned that only about 7% of the 250,000 recipients of our print newsletters subscribe to *IAC Express*. Published every Monday, *IAC Express* ensures that healthcare professionals receive the "latest" immunization news. Subscribers describe it as "invaluable" and "essential" to their continuing immunization education.

**It just takes a minute to
sign up for *IAC Express*!**

**To subscribe, send an email message to
express@immunize.org and place the
word SUBSCRIBE in the "Subject:" field.**

We urge you to give *IAC Express* a try. It's free (and you can always unsubscribe). To subscribe, see the information above.

We hope you will come to appreciate these weekly updates as much as the nurse who wrote: "Thank you so much for this truly valuable resource!! *IAC Express* has become a source of my weekly continuing education, and I am proud to say I have become a reliable up-to-date resource for all in my office!!"

Save time & increase vaccination rates with standing orders!

What are the primary benefits of using standing orders? Use of standing orders can dramatically increase immunization rates. It also can save physician time.

How can I find sample standing orders? Go to www.immunize.org/catg.d/p3089.pdf. You'll find background information about standing orders, plus model standing orders for the administration of eight vaccines commonly given to adults.

If you're wondering if Medicare reimburses for pneumococcal vaccinations administered under standing orders, the answer is yes. The cost of the vaccine and its administration to Medicare enrollees is reimbursable under Medicare Part B. Of course, state laws regarding who can administer vaccines still apply.

DISCLAIMER: *Vaccinate Adults!* is available to all readers free of charge. Some of the information in this issue is supplied to us by the Centers for Disease Control and Prevention in Atlanta, Georgia, and some information is supplied by third-party sources. The Immunization Action Coalition (IAC) has used its best efforts to accurately publish all of this information, but IAC cannot guarantee that the original information as supplied by others is correct or complete, or that it has been accurately published. Some of the information in this issue is 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 St. Paul, Minnesota.

Is safeguarding your vaccine supply worth 25 minutes of your time?

That's the time it takes to view this CDC video, which covers temperature monitoring equipment, required documentation and record-keeping, storage and handling procedures, and action steps to take when a problem occurs.

"How to Protect Your Vaccine Supply"

Cost is \$15. For 20 or more copies, contact us for discount pricing. For more information or to order online, visit www.immunize.org/vachandling. To order by fax or mail, use the order form on page 11.

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



Advisory Board

Liaisons from Organizations

William L. Atkinson, MD, MPH
National Immunization Program, CDC

Dennis A. Brooks, MD, MPH, MBA
National Medical Association

Stephen L. Cochi, MD, MPH
National Immunization Program, CDC

Stanley A. Gall, MD
Amer. College of Obstetricians & Gynecologists

Bruce Gellin, MD, MPH
National Vaccine Program Office, DHHS

Neal A. Halsey, MD
Institute for Vaccine Safety, Johns Hopkins Univ.

Mark A. Kane, MD, MPH
Children's Vaccine Program at PATH

Samuel L. Katz, MD
Pediatric Infectious Diseases Society

Mary Beth Koslap-Petraco, RN-CS, CPNP
National Assn. of Pediatric Nurse Practitioners

Harold S. Margolis, MD
Pediatric Dengue Vaccine Initiative

Martin G. Myers, MD
National Network for Immunization Information

Kathleen M. Neuzil, MD, MPH
American College of Physicians

Paul A. Offit, MD
Vaccine Education Ctr., Children's Hosp. of Phila.

Walter A. Orenstein, MD
Emory Vaccine Center, Emory University

Mitchel C. Rothholz, RPh
American Pharmacists Association

Thomas N. Saari, MD
American Academy of Pediatrics

William Schaffner, MD
Infectious Diseases Society of America

Thomas E. Stenvig, RN, PhD
American Nurses Association

Litjen Tan, PhD
American Medical Association

John W. Ward, MD
Division of Viral Hepatitis, NCID, CDC

Walter W. Williams, MD, MPH
Office of Minority Health, CDC

Individuals

Anthony Chen, MD
International Community Health Svcs., Seattle

John D. Grabenstein, RPh, PhD
ImmunoFacts, Burke, VA

Hie-Won L. Hann, MD
Jefferson Medical College, Philadelphia, PA

Neal Holtan, MD, MPH
St. Paul Ramsey Co. Public Health, St. Paul, MN

Margaret K. Hostetter, MD
Yale University, New Haven, CT

Edgar K. Marcuse, MD, MPH
University of Washington School of Medicine

Brian J. McMahon, MD
Alaska Native Medical Center, Anchorage, AK

Gregory A. Poland, MD
Mayo Clinic, Rochester, MN

Sarah Jane Schwarzenberg, MD
University of Minnesota

Coleman I. Smith, MD
Minnesota Gastroenterology, Minneapolis, MN

Richard K. Zimmerman, MD, MPH
University of Pittsburgh

Deborah L. Wexler, MD
Executive Director

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**

Available in videotape (VHS) or DVD format. Each comes with presenter's notes and a skills checklist.

Cost is \$30 per copy. For 20 or more copies, contact us for discount pricing. For more information or to order online, visit www.immunize.org/iztech. To order by fax or mail, use the order form on page 11.

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

Immunization record cards for adults!



Give all your adult patients a permanent vaccination record card from IAC. Printed on rip-proof, smudge-proof, waterproof paper, this durable canary-yellow card is sized to fit in a wallet alongside other important cards. To view the card, visit www.immunize.org/adultzcards/pictures.htm.

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/adultzcards, or use the order form on page 11.

(To receive sample cards, email your request to admin@immunize.org.)

Vaccine Highlights

Recommendations, schedules, and more

Editor's note: The information on these pages is current as of May 12, 2005.

ACIP statements

All clinicians should have a set of Advisory Committee on Immunization Practices (ACIP) statements, the public health recommendations on vaccines, published periodically in the *Morbidity and Mortality Weekly Report (MMWR)*. Free continuing education credits are available for reading many of the statements and completing the brief test at the end of the statement. To obtain ACIP statements

- Download individual statements from links on IAC's website: www.immunize.org/acip
- Download individual statements from CDC's website: www.cdc.gov/nip/publications/acip-list.htm
- Call the CDC-INFO Contact Center at (800) CDC-INFO [(800) 232-4636]

Vaccine news

On May 3, FDA approved GlaxoSmithKline's biologics license application for Boostrix, a tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine, adsorbed (Tdap). It is indicated for active booster immunization against diphtheria, tetanus, and pertussis for individuals ages 10–18 years. To view the package insert, go to www.fda.gov/cber/label/tdapgl050305LB.pdf. It is anticipated that ACIP will discuss the use of this vaccine at its June 29–30 meeting.

On Feb. 10–11, the ACIP met and deliberated on the use of influenza vaccines for the 2005–06 influenza season. Among the changes was the addition of people with certain neuromuscular conditions that compromise respiratory function to the groups for whom vaccination is now recommended. This and other changes will be included in the annual "Recommendations of the ACIP: Prevention and Control of Influenza," which is expected to be published in *MMWR* in May.

On Jan. 14, FDA approved sanofi pasteur's (formerly Aventis Pasteur) biologics license application for Menactra, a conjugated meningococcal vaccine (MCV4). The vaccine is for the prevention of invasive meningococcal disease caused by *Neisseria meningitidis* serogroups A, C, Y, and W-135. It may be used in persons 11–55 years of age. To view the package insert, go to www.fda.gov/cber/label/mpdtave011405LB.pdf.

On Feb. 10, ACIP voted to recommend routine vaccination with MCV4 for two age cohorts: children ages 11–12 years and adolescents age 15 years. In addition, ACIP voted to recommend routine meningococcal vaccination of all college freshmen living in dormitories, preferably with MCV4. Publication of the revised ACIP statement is anticipated in late May. A revised interim Vaccine Information Statement (VIS), dated 4/04/05, has been issued. It should be used with MCV4 and can also be used with the meningococcal polysaccharide vaccine (MPSV4). The older VIS dated 7/28/03, may only be used with MPSV4. To obtain this new VIS and all other VISs, some in up to 32 languages, go to www.immunize.org/vis.

On Nov. 3, 2004, the Centers for Medicare & Medicaid Services (CMS) issued Medicare's final rule for physician payment for 2005, effective Jan. 1. The final rule increased payments for vaccinations and other types of injections. For example, the average payment for administering injectable influenza vaccine increased from \$8 to \$18. Physicians can now also be paid for vaccinations, even when performed on the same day as other Medicare-covered services. For more information, go to www.cms.hhs.gov/media/press/release.asp?Counter=1248.

On March 24, 2004, FDA approved a supplement to Aventis Pasteur's license application for Decavac, the preservative-free formulation of tetanus and diphtheria (Td) toxoids adsorbed, for adult use. It is indicated for use as a routine Td booster every 10 years and may be used in persons 7 years of age or older.

Influenza & PPV rates for 2003

On Nov. 5, 2004, CDC published "Influenza and Pneumococcal Vaccination Coverage Among Persons Aged ≥65 Years and Persons Aged 18–64 Years with Diabetes or Asthma—U.S., 2003" in the *MMWR*, Vol. 53 (43). Although substantial increases in vaccination rates for adults 65 years and older have occurred over the last decade for both influenza (+20%) and pneumococcal polysaccharide vaccines (+36.8%), they still fall below the national health objectives of 90% for 2010. Of even greater concern, vaccination rates for noninstitutionalized adults 18–64 years with high-risk conditions (e.g., asthma, diabetes) are seriously below the 2010 target of 60%. The 2003 state vaccination rates can be viewed in the table to the right. To read the complete *MMWR* article, go to www.cdc.gov/mmwr/preview/mmwrhtml/mm5343a2.htm.

2003 Vaccination Rates for Influenza & PPV

The table below displays (1) influenza and pneumococcal (PPV) vaccination rates among adults ages ≥65 years, (2) influenza vaccination rates among adults ages 18–64 years with asthma or diabetes, and (3) pneumococcal vaccination rates among adults ages 18–64 years with diabetes.

State	Influenza			PPV	
	≥65 yrs	Asthma	Diab.	≥65 yrs	Diab.
U.S.	69.9	34.0	49.0	64.2	37.1
AL	70.2	33.8	47.4	61.4	34.8
AK	66.5	38.7	50.4	59.6	41.2
AZ	68.9	33.9	54.4	65.5	33.8
AR	71.0	40.2	45.2	61.9	30.7
CA	72.5	28.7	40.2	65.2	29.5
CO	74.2	39.0	52.7	69.1	41.2
CT	74.3	39.9	54.8	64.5	33.5
DE	70.0	34.8	44.0	67.4	27.9
DC	63.0	24.7	41.8	50.1	*
FL	65.9	28.8	43.4	64.5	43.7
GA	67.0	31.6	38.2	60.5	26.2
HI	71.6	42.0	57.5	44.5	26.4
ID	70.3	31.3	54.6	67.2	38.6
IL	63.3	32.4	38.1	56.7	29.4
IN	66.1	33.7	46.6	61.5	40.5
IA	77.5	31.3	62.2	71.4	48.5
KS	70.8	30.4	49.8	60.3	33.9
KY	69.1	29.7	46.6	59.6	33.8
LA	68.3	36.6	40.9	64.2	31.6
ME	74.8	39.3	49.0	64.8	35.0
MD	68.4	38.4	46.6	62.0	38.0
MA	74.9	36.8	49.7	69.4	39.1
MI	67.5	34.3	42.1	62.7	38.0
MN	80.3	40.1	56.3	73.0	33.6
MS	69.0	30.4	39.8	61.8	22.6
MO	69.9	31.9	48.6	61.1	35.2
MT	72.8	46.6	58.8	69.1	58.2
NE	73.6	43.1	57.0	64.8	37.7
NV	60.0	27.8	29.0	63.2	40.0
NH	73.9	36.8	61.9	69.3	50.6
NJ	67.2	31.6	41.9	62.4	29.6
NM	72.4	39.7	61.3	63.9	46.1
NY	68.0	38.6	53.5	61.7	43.6
NC	68.8	34.0	46.1	66.6	38.3
ND	73.0	38.8	56.3	71.2	36.4
OH	68.0	30.4	38.0	64.7	41.8
OK	75.8	38.0	53.9	68.6	41.3
OR	70.5	34.4	54.5	71.7	48.4
PA	69.2	33.6	59.3	66.1	37.1
RI	76.2	42.0	58.9	69.3	46.6
SC	69.3	38.9	52.1	63.0	34.9
SD	77.9	45.8	62.4	63.7	37.7
TN	69.1	32.8	47.4	60.8	28.1
TX	67.7	31.9	40.8	62.0	29.2
UT	74.8	30.9	53.1	66.2	53.4
VT	74.1	30.7	56.0	66.1	40.7
VA	69.6	32.9	45.1	65.2	34.8
WA	73.4	36.5	50.5	68.6	43.8
WV	69.1	37.5	52.4	63.8	40.3
WI	72.1	34.3	58.0	66.7	55.5
WY	72.6	46.6	47.3	70.4	46.0

*Number of respondents too small for meaningful analysis.

Hepatitis B Virus Transmitted in U.S. Long-Term-Care Facilities

Good infection-control practices can prevent patient-to-patient HBV transmission in all healthcare settings

Dr. Deborah Wexler's note: In the article below, which is reprinted in its entirety from the March 11, 2005, issue of *Morbidity and Mortality Weekly Report*, CDC reports on recent outbreaks of HBV infection among patients undergoing blood glucose monitoring in three U.S. long-term-care (LTC) facilities. Two patients died. CDC attributes the outbreaks to shared devices and other breaks in infection-control practices related to blood glucose monitoring.

Included in the article are several CDC-recommended practices health professionals should follow to prevent patient-to-patient HBV transmission from diabetes-care procedures in LTC settings. Though the recommendations were written for specific settings (LTC facilities), many are important for staff in all healthcare settings to follow. HBV is transmitted in a variety of medical settings, as the articles in the reference section make clear. It is up to us, as health professionals, to see to it that every setting in which we provide services for patients is taking proper precautions to prevent transmission of hepatitis B virus to patients.

Transmission of Hepatitis B Virus Among Persons Undergoing Blood Glucose Monitoring in Long-Term-Care Facilities—Mississippi, North Carolina, and Los Angeles County, California, 2003–2004

Regular monitoring of blood glucose levels is an important component of routine diabetes care (1). Capillary blood is typically sampled with the use of a fingerstick device and tested with a portable glucometer. Because of outbreaks of hepatitis B virus (HBV) infections associated with glucose monitoring, CDC and the Food and Drug Administration (FDA) have recommended since 1990 that fingerstick devices be restricted to individual use (2,3). This report describes three recent outbreaks of HBV infection among residents in long-term-care (LTC) facilities that were attributed to shared devices and other breaks in infection-control practices related to blood glucose monitoring. Findings from these investigations and previous reports suggest that recommendations concerning standard precautions and the reuse of fingerstick devices have not been adhered to or enforced consistently in LTC settings (2–5). The findings underscore the need for education, training, adherence to standard precautions, and specific infection-control recommendations targeting diabetes-care procedures in LTC settings (4–6) (Box 1).

The three outbreaks described in this report were all reported by state or local health departments to CDC, which provided epidemiologic and laboratory assistance. In each of the three LTC settings, residents were tested for serologic markers for HBV infection. Under the case definitions used in these investigations, residents who tested positive for IgM antibody to hepatitis B core antigen (anti-HBc) were defined as having acute HBV infection. Residents who tested positive for hepatitis B surface antigen (HBsAg) and total anti-HBc, but who tested negative for IgM anti-HBc, were considered

to have chronic HBV infection. Residents who tested positive for total anti-HBc, but who tested negative for HBsAg, or those who had antibody to HBsAg (anti-HBs) ≥ 10 milli-International Units (mIU) per milliliter were considered immune to HBV infection. Residents were considered susceptible to HBV if they had no HBV markers. A retrospective cohort study was performed as part of each investigation; the study was restricted to acutely infected and susceptible residents to identify risk factors. In all three investigations, staff members were evaluated; none were identified as sources of infection. Medical records were reviewed and infection-control procedures were assessed through direct observation and by interviews with nursing staff members.

Nursing Home A, Mississippi

During November–December 2003, the Mississippi Department of Health received reports of two fatal cases of acute HBV infection among residents of nursing home A. The first patient with recognized symptoms of HBV infection had received serologic testing for viral hepatitis infection in June 2003 as part of a hospital emergency department evaluation for abdominal pain. Although this patient was found to have a positive test for IgM anti-HBc, indicating acute HBV infection, and the finding was noted in the patient's chart in September 2003, nursing home A did not contact the state health department or initiate an internal investigation. Subsequently, the patient died.

In December 2003, after a second patient with acute HBV infection had died, and after a third with acute HBV infection was reported, serologic testing was performed on specimens from all 158 residents. Test results were available for 160 residents, including the two decedents; 15 (9%) had acute HBV infection, one was chronically infected,

(continued on page 6)

BOX 1. Recommended practices for preventing patient-to-patient transmission of hepatitis viruses from diabetes-care procedures in long-term-care settings

Diabetes-care procedures and techniques

- Prepare medications such as insulin in a centralized medication area; multidose insulin vials should be assigned to individual patients and labeled appropriately.
- Never reuse needles, syringes, or lancets.
- Restrict use of fingerstick capillary blood sampling devices to individual patients.
- Consider using single-use lancets that permanently retract upon puncture.
- Dispose of used fingerstick devices and lancets at the point of use in approved sharps containers.
- Assign separate glucometers to individual patients. If a glucometer used for one patient must be reused for another patient, the device must be cleaned and disinfected. Glucometers and other environmental surfaces should be cleaned regularly and whenever contamination with blood or body fluids occurs or is suspected.
- Store individual patient supplies and equipment, such as fingerstick devices and glucometers, within patient rooms when possible.
- Keep trays or carts used to deliver medications or supplies to individual patients outside patient rooms. Do not carry supplies and medications in pockets.
- Because of possible inadvertent contamination, unused supplies and medications taken to a patient's bedside during fingerstick monitoring or insulin administration should not be used for another patient.

Hand hygiene and gloves

- Wear gloves during fingerstick blood glucose monitoring, administration of insulin, and any other procedure involving potential exposure to blood or body fluids.
- Change gloves between patient contacts and after every procedure that involves potential exposure to blood or body fluids, including fingerstick blood sampling. Discard gloves in appropriate receptacles.
- Perform hand hygiene (i.e., hand washing with soap and water or use of an alcohol-based hand rub) immediately after removal of gloves and before touching other medical supplies intended for use on other patients.

15 (9%) were immune, and 129 (81%) were susceptible. Percutaneous and other possible exposures among residents were evaluated. Among 38 residents who routinely received fingersticks for glucose monitoring, 14 had acute HBV infection, compared with one of 106 residents who did not receive fingersticks (relative risk [RR] = 39.0; 95% confidence interval [CI] = 5.3–290.0).

Glucose monitoring of 14 residents with acute HBV infection and the resident with chronic HBV infection was performed by staff members based at the same nursing station. Reviews of infection-control practices and site inspections indicated that each of the four nursing stations in nursing home A was equipped with one glucometer and one spring-loaded, pen-like fingerstick device. Staff members reported that a new end cap and lancet assembly was used for each fingerstick procedure; however, the spring-loaded barrel and glucometer were not routinely cleaned between patients. Investigators also observed that insulin and other multidose medication vials were not labeled with patient names or the dates the vials were opened. In an anonymous survey, several staff members reported observing other workers reuse a needle or lancet or fail to change gloves between patients. No other percutaneous exposures were associated with illness.

Assisted Living Center B, Los Angeles County, California

During January–February 2004, the Los Angeles County Department of Health Services received reports of four residents with diabetes in assisted living center B who had acute HBV infection during November 2003–January 2004. Because these

initial reports were among residents with diabetes, serologic testing was performed in January 2004 on residents who had received fingersticks for blood glucose monitoring during May–December 2003. Of 22 residents tested (three declined), eight (36%) had acute HBV infection, including the four residents previously identified; six (27%) were immune (and excluded from the analysis), and none had chronic infection. Reviews of patient records indicated that one of the acutely infected residents had been repeatedly tested at a separate hemodialysis center and had seroconverted to HBsAg-positive in July 2003. Of the nine patients who had daily exposure to fingerstick procedures performed by nursing staff, eight had acute HBV infection, compared with none among the seven residents who performed their own fingersticks (RR = undefined; CI = 2.8–undefined). Although receipt of insulin was also significantly associated with infection, two residents with acute HBV infection had not received insulin. Other percutaneous exposures (e.g., podiatric or dental care) were not associated with HBV infection.

Fingerstick procedures were often performed by nursing staff members in a central living area, with diabetes patients seated at a common table. Although residents had their own fingerstick devices, nurses reported occasionally using a pen-like fingerstick device barrel from their own kits to collect consecutive blood samples; a single glucometer was typically used for all residents. Nurses reported that they were discouraged from wearing gloves to decrease the sense of a clinical environment, and hand hygiene was not performed between procedures.

Nursing Home C, North Carolina

In May 2003, a case of HBV infection in a resident of nursing home C was reported to the North Carolina Department of Health. During June–July 2003, serologic testing was performed on specimens from all 192 residents; 11 (6%) had acute HBV infection, 16 (8%) were immune, and 165 (86%) were susceptible. No resident had chronic HBV infection. Of 45 residents who received fingersticks for glucose monitoring, eight (18%) had acute HBV infection, compared with three (3%) of 117 residents without this exposure (RR = 6.9; CI = 1.9–25.0). After data were controlled for fingerstick exposures, acute HBV infection was not associated with other percutaneous exposures (e.g., insulin injections, podiatry procedures, or phlebotomy). Two diabetes patients at nursing home C who were potential sources of the outbreak were identified retrospectively; one had clinical symptoms of hepatitis B and serologic markers of acute infection during 2002, whereas the other had chronic HBV infection and died in February 2002.

Interviews with staff and direct observation of glucose-monitoring practices revealed that only single-use lancets were used, and insulin vials were not shared among patients. However, on each wing of the facility, a single glucometer was used for all patients receiving fingersticks; glucometers were not routinely cleaned between patients. On some days, a single healthcare worker performed approximately 20 fingerstick procedures during a single work shift. In an anonymous survey, nursing staff members indicated that some healthcare workers did not always change gloves between patients when performing fingerstick procedures.

Reported by: R Webb, MD, M Currier, MD, J Weir, KM McNeill, MD, Mississippi Dept of Health. E Bancroft, MD, D Dassey, MD, J Maynard, D Terashita, MD, Los Angeles County Dept of Health Svcs, California. K Simeonsson, MD, A Chelminski, J Engel, MD, North Carolina Dept of Health and Human Svcs. JF Perz, DrPH, AE Fiore, MD, IT Williams, PhD, BP Bell, MD, Div of Viral Hepatitis, National Center for Infectious Diseases; T Harrington, MD, C Wheeler, MD, EIS officers, CDC.

Editorial Note:

Lack of adherence to standard precautions and failure to implement long-standing recommendations against sharing fingerstick devices place LTC residents at risk for acquiring infections from bloodborne pathogens such as HBV (2,3,7). In nursing home A, the spring-loaded barrel of a fingerstick device was used for multiple patients. Previous outbreaks have been linked to such devices when the platform or barrel supporting the disposable lancet was reused for multiple patients, when used lancets were stored with unused lancets, or when lancet caps were reused (2,3; CDC, unpublished data, 1999). In assisted living center B, nursing staff members routinely administered fingersticks without wearing gloves or performing hand hygiene between patients, and spring-loaded hand hygiene devices were also occasionally shared.

BOX 2. Recommended medical management, training, and oversight measures to prevent patient-to-patient transmission of hepatitis viruses from diabetes-care procedures in long-term-care settings.

- Regularly review patient schedules for fingerstick blood glucose sampling and insulin administration and reduce the number of percutaneous procedures to the minimum necessary for appropriate medical management of diabetes and its complications.
- Ensure that adequate staffing levels are maintained to perform all scheduled diabetes-care procedures, including fingerstick blood glucose monitoring.
- Consider diagnosis of acute viral hepatitis infection in patients with illness that includes hepatic dysfunction or elevated liver transaminases (serum alanine aminotransferase and aspartate aminotransferase).
- Provide a full hepatitis B vaccination series to all previously unvaccinated staff members with exposure to blood or body fluids. Check and document postvaccination titers 1–2 months after completion of the vaccination series.
- Establish responsibility for oversight of infection-control activities. Investigate and report any suspected case of newly acquired bloodborne infection.
- Require staff members to know standard precautions and demonstrate proficiency in taking these precautions with procedures involving potential blood or body fluid exposures.
- Provide staff members who perform percutaneous procedures with infection-control training that includes practical demonstration of aseptic techniques and instruction regarding reporting exposures or breaches. Conduct annual retraining of all staff members who perform procedures with exposure to blood or body fluids.
- Assess compliance with infection-control recommendations (e.g., hand hygiene or glove changes) by periodic observation of staff and tracking use of supplies.

(continued on page 9)

Pneumococcal polysaccharide vaccine (PPV23)

CDC answers your questions

William L. Atkinson, MD, MPH, medical epidemiologist, CDC's National Immunization Program, answers your questions on pneumococcal polysaccharide vaccine (PPV).

To obtain a copy of the official CDC recommendation "Prevention of Pneumococcal Disease," call (800) CDC-INFO [(800) 232-4636] or go to ftp.cdc.gov/pub/publications/mmwr/rr/rr4608.pdf.

How serious is pneumococcal disease?

An estimated 40,000 cases of invasive pneumococcal disease occur annually. Case-fatality rates are high, particularly when disease results in meningitis (~30%) or bacteremia (~20%). In addition, pneumococcal pneumonia, often a secondary complication of influenza, results in an estimated 175,000 hospitalizations annually.

My patient doesn't have a record of receiving PPV, but she believes she may have had it in the past. What should I do?

Persons with uncertain or unknown vaccination status should be vaccinated.

Should all nursing home patients be vaccinated against pneumococcal disease?

Yes. Standing orders for vaccination of persons admitted to long-term care facilities can help simplify the procedure.

Should people with asthma receive PPV?

Asthma is not an indication for routine pneumococcal vaccination unless it occurs with chronic bronchitis, emphysema, or long-term systemic corticosteroid use. However, persons with obstructive lung disease should be vaccinated regardless of the cause.

My patient has had pneumococcal pneumonia. Is vaccination still necessary?

Maybe. More than 80 known serotypes of pneumococcus exist; 23 serotypes are in the current vaccine. Infection with one serotype does not necessarily produce immunity to other serotypes. Please note, however, that vaccination is indicated only for those in a risk group (see table). A history of pneumococcal pneumonia alone is not an indication for vaccination with PPV unless other risk factors are present (see table).

Should HIV-positive patients receive PPV?

Yes. Patients with HIV infection should be given PPV as soon as possible after diagnosis and a one-time revaccination dose at the appropriate interval (see table). The risk of pneumococcal infection is up to 100 times greater in HIV-infected persons than in other adults of similar age. Although severely immunocompromised persons may not respond well to the vaccine, the risk of disease is great enough to warrant vaccination even though there is a chance that the vaccine may not produce an antibody response.

If I give PPV to my patient now, must I wait a month before giving influenza or Td vaccine?

Inactivated influenza vaccine and Td toxoids may be given at the same time as or at any time before or after a dose of PPV. There are no minimum interval requirements between the doses of these or any other inactivated vaccines.

When should I vaccinate patients who are planning to have either a cochlear implant or elective splenectomy?

If time permits, give PPV to such patients at least 2 weeks before surgery.

What needle length is recommended for administration of PPV to adults?

Pneumococcal vaccine may be given either IM or SC. Use a 1–1½" needle for IM, depending on muscle mass. For SC, use a 5/8–¾" needle.

Which patients should also receive the pneumococcal conjugated vaccine (PCV)?

PCV is recommended for all children age less than 24 months as well as children ages 24–59 months with a high-risk medical condition. Consult the ACIP recommendations for more details (*MMWR*, Vol. 49, RR-9, 10/6/00).

Immunocompetent Persons	
Who needs pneumococcal (PPV) vaccine?	Who in the groups in the left column needs revaccination?
Vaccinate all persons age 65 years and older.	Revaccination for healthy persons is not recommended. However, if a patient received the first dose prior to age 65, give a single revaccination at age 65 (or older) if at least 5 years have elapsed since the previous dose.
Vaccinate persons ages 2–64 years who <ul style="list-style-type: none"> • have chronic cardiovascular disease (including congestive heart failure and cardiomyopathy), chronic pulmonary disease (including COPD and emphysema), or diabetes mellitus or are cochlear implant patients. • have chronic liver disease (including cirrhosis), are alcoholic, or have cerebrospinal fluid leaks. • live in special environments or social settings (including Alaska Natives and certain American Indian populations). 	If the patient received the first dose prior to age 65, give a single revaccination at age 65 (or older) if at least 5 years have elapsed since the previous dose.
Vaccinate persons ages 2–64 years with functional or anatomic asplenia (including persons with sickle cell disease or splenectomy patients).	If a vaccinated patient in this risk group is older than age 10 years, give a single revaccination if at least 5 years have elapsed since the previous dose. If the patient is age 10 years or younger, consider revaccination 3 years after the previous dose.
Immunocompromised Persons	
Vaccinate immunocompromised patients age 2 years and older, including those with HIV infection, leukemia, lymphoma, Hodgkin's disease, multiple myeloma, generalized malignancy, chronic renal failure (including dialysis patients), or nephrotic syndrome; those receiving immunosuppressive therapy (including long-term systemic corticosteroids); and those who have received an organ or bone marrow transplant.	If a vaccinated immunocompromised patient is older than age 10 years, give a single revaccination if at least 5 years have elapsed since the previous dose. If the patient is age 10 years or younger, consider revaccination 3 years after the previous dose.

www.immunize.org/catg.d/2015pne.pdf • Item #P2015 (5/05)

While giving an injection, a nurse had blood return in the syringe upon aspirating. What should she have done with the vaccine?

Although aspiration is no longer recommended, if you do aspirate and get a flash of blood, then the procedure is to withdraw the needle and start over. The syringe, needle, and contaminated dose of vaccine should be discarded in a sharps container, and a new syringe and needle should be used to draw up and administer another dose of vaccine. This is a waste of expensive vaccine that could be avoided by simply not aspirating.

What percentage of vaccine recipients will experience an anaphylactic reaction?

It is estimated that for every million doses administered, about one (~0.000001%) will result in an anaphylactic reaction following vaccination. With proper screening, most providers who administer thousands of vaccines in their lifetimes will never see an anaphylactic reaction.

What are the special recommendations on vaccine administration for people with clotting disorders?

This issue is discussed in the 2002 ACIP “General Recommendations on Immunization” [MMWR 2002;51(No. RR-2), 23]. Intramuscular injections should be scheduled shortly after antihemophilia therapy or just prior to a dose of anticoagulant. For both intramuscular and subcutaneous injections a fine needle (23 gauge or smaller) should be used and firm pressure applied to the site, without rubbing, for at least 2 minutes. Providers should avoid administration of vaccines by a route not approved by the FDA (i.e., administration of IM vaccines by the SC route).

Do persons who received chemotherapy need their vaccines repeated?

Vaccines received before starting chemotherapy do not need to be repeated after chemotherapy is completed. Chemotherapy does not negate vaccine-induced immunity. However, revaccination is recommended for persons who are recipients of a hematopoietic stem cell transplant (HSCT), such as a bone marrow transplant, because immunity present before the transplant is lost; it may not be replaced by donor cells.

Vaccinate Adults correction policy

The Immunization Action Coalition works tirelessly to ensure the accuracy of the information we make available. If you find an error, please notify us immediately. We publish notification of significant errors in *Vaccinate Adults* and on our email announcement service *IAC Express*. Be sure you're signed up for this service. Visit www.immunize.org/express to sign up, or subscribe by sending an email message to express@immunize.org. Enter the word SUBSCRIBE in the “Subject:” field. No message is needed.

Which vaccinations should be given to an adult who has had a stem cell transplant?

Antibody titers to vaccine-preventable diseases (e.g., tetanus, poliovirus, measles, mumps, rubella, and encapsulated bacteria) decline during the 1–4 years after HSCT, if the recipient is not revaccinated. HSCT recipients are at increased risk for certain vaccine-preventable diseases, including those caused by encapsulated bacteria and should receive Hib, PPV, and influenza vaccines at a minimum. Other vaccines, such as tetanus and diphtheria toxoids, inactivated polio vaccine, and MMR should also be repeated. For a complete discussion of the indications and schedule of vaccination, see “Guidelines for Preventing Opportunistic Infections Among Hematopoietic Stem Cell Transplant Recipients: Recommendations of CDC, the Infectious Diseases Society of America, and the American Society of Blood and Marrow Transplantation.” *MMWR* 2000;49(No. RR-10). A summary of this document is available on the National Immunization Program website at www.cdc.gov/nip/publications/hsct-recs.pdf.

Hepatitis A and B

by Linda A. Moyer, RN, and Eric E. Mast, MD, MPH

Should healthcare employees who have no patient contact but clean areas that could be contaminated with blood or other body fluids be given hepatitis B vaccination?

Yes. Persons who have a reasonable expectation of being exposed to blood on the job, including custodial workers who clean areas contaminated with blood or other body fluids, should be given hepatitis B vaccine. However, healthcare employees who would not be expected to have occupational risk, such as receptionists, managers and administrators, billing staff, and general office workers do not need to be given the vaccine. All staff persons who have a reasonable expectation of blood exposure should receive training on standard precautions for prevention of bloodborne infection, such as using gloves when cleaning up potentially infectious materials.

I read about a new study showing an association between recombinant hepatitis B vaccine and multiple sclerosis (MS) in adults. What can I tell my patients who are worried about this issue?

The benefits of hepatitis B vaccine are well documented. As many published studies and extensive reviews indicate, hepatitis B vaccine is safe and effective. Millions of persons worldwide have received hepatitis B vaccine without developing MS or any other autoimmune disease.

The study to which you refer, “Recombinant Hepatitis B Vaccine and the Risk of Multiple Sclerosis: A Prospective Study,” was published September 14, 2004, in *Neurology*. This study has a number of important weaknesses. For example, the main finding of the study is based on 11 people.

In the study, only 11 of the 163 people who had MS had ever received hepatitis B vaccine—the other 152 people with MS had never received hepatitis B vaccine. As such, the sample size is too small to draw definitive conclusions. In addition, the researchers did not verify the vaccination histories of the people in the study.

Both CDC and WHO’s Global Advisory Committee on Vaccine Safety have published responses to this article. Access the original article abstract and these responses on IAC’s hepatitis B vaccine safety page at www.immunize.org/safety/hepb.htm.

Should daycare workers be routinely vaccinated against hepatitis A?

No. Although HAV infection can occur at daycare centers due to poor hygiene among children wearing diapers and improper handling of diapers by staff, the results of serologic studies do not indicate an increased prevalence of HAV infection among staff at daycare centers compared with control populations.

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 with ≥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 months following the last dose of vaccine. (Infants born to HBsAg-positive mothers 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). 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 (≤ 6 mos). Its presence indicates acute infection.

HBsAg: *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.

Hepatitis B Virus Transmitted in U.S. . . .

(continued from page 6)

In nursing home C, as with other recent outbreaks (8; CDC, unpublished data, 2002), transmission of HBV among residents with diabetes occurred despite use of single-use fingerstick devices or insulin medication vials that were dedicated for individual patient use. In these settings, glucose monitors, insulin vials, or other surfaces contaminated with blood from an HBV-infected person might have resulted in transfer of infectious virus to a healthcare worker's gloves and to the fingerstick wound or subcutaneous injection site of a susceptible resident. Similar indirect transmission of HBV in healthcare settings through contaminated environmental surfaces or inadequately disinfected equipment has been reported with other healthcare procedures, such as dialysis (6,9). HBV is stable at ambient temperatures; infected patients, who often lack clinical symptoms of hepatitis, can have high concentrations of HBV in their blood or body fluids (6). To prevent patient-to-patient transmission of infections through cross-contamination, healthcare providers should avoid carrying supplies from resident to resident and avoid sharing devices, including glucometers, among residents.

The risk for patient-to-patient transmission of HBV infection can be reduced by implementing specific prevention measures (Boxes 1 and 2). LTC staff often perform numerous percutaneous procedures; frequent blood glucose monitoring increases opportunities for bloodborne pathogen transmission. The outbreak investigations reported here identified residents with diabetes who received fingersticks from nursing staff members as often as four times per day, according to their physician's routine orders, despite having consistently normal glucose levels. Expert panels have concluded that approximately 8 years are needed before the benefits of glycemic control result in reductions in microvascular complications (1,10). In LTC settings, schedules for fingerstick blood sampling of individual patients should be reviewed regularly to reduce the number of percutaneous procedures to the minimum necessary for their appropriate medical management. In each of the investigations described in this report, implementation of infection-control measures (Boxes 1 and 2) was recommended, along with follow-up serologic testing for markers of HBV.

An estimated 70,000–80,000 HBV infections occur each year in the United States. Most of these infections occur among young adults with behavioral risk factors (i.e., sexual contact and injection-drug use); these adults should receive hepatitis B vaccine. Preventing transmission of HBV among patients in long-term-care settings requires adherence to recommended infection-control practices and prompt response to identified instances of transmission. Routine hepatitis B vaccination or screening of LTC residents is not recommended. In the outbreaks described in this report, initial cases were not identified or investigated in a timely fashion,

resulting in missed opportunities to correct deficient practices and interrupt transmission. Evidence of acute viral hepatitis in any LTC resident should prompt a thorough investigation. For a case involving a resident with diabetes, fingerstick blood sampling procedures and insulin administration should receive particular scrutiny. Health departments should encourage reporting of such cases and offer assistance in identifying the source of infection. CDC continues to support investigations in LTC and other healthcare settings and is working toward improved implementation of the infection-control recommendations described in this report.

Acknowledgments

The findings in this report are based, in part, on data provided by C Rank, R Hotchkiss, B Amy, MD, Mississippi Dept of Health, J Rosenberg, MD, Div of Communicable Disease Control, California Dept of Health Svcs, P MacDonald, PhD, Dept of Epidemiology, Univ of North Carolina, Chapel Hill; S Smith, P Poole, North Carolina Dept of Health and Human Svcs, M Viray, Epidemiology Program Office, CDC.

References

1. American Diabetes Association. Standards of medical care in diabetes. *Diabetes Care* 2004;27:S15–35.
2. CDC. Nosocomial transmission of hepatitis B virus associated with a spring-loaded fingerstick device—California. *MMWR* 1990;39:610–3.
3. CDC. Nosocomial hepatitis B virus infection associated with reusable fingerstick blood sampling devices—Ohio and New York City, 1996. *MMWR* 1997;46:217–21.
4. CDC. Update: universal precautions for prevention of transmission of human immunodeficiency virus, hepatitis B virus, and other bloodborne pathogens in healthcare settings. *MMWR* 1988;37:377–88.
5. American Association of Diabetes Educators. Educating providers and persons with diabetes to prevent the transmission of bloodborne infections and avoid injuries from sharps. Chicago, IL: American Association of Diabetes Educators; 1997. Available at <http://www.aadenet.org/PublicAffairs/PositionStatements/EducProvidersBloodborneInfections.pdf>.
6. Williams IT, Perz JF, Bell BP. Viral hepatitis transmission in ambulatory health care settings. *Clin Infect Dis* 2004;38:1592–8.
7. Desenclos JC, Bourdiol-Razes M, Rolin B, et al. Hepatitis C in a ward for cystic fibrosis and diabetic patients: possible transmission by spring-loaded finger-stick devices for self-monitoring of capillary blood glucose. *Infect Control Hosp Epidemiol* 2001;22:701–7.
8. Khan AJ, Cotter SM, Schulz B, et al. Nosocomial transmission of hepatitis B virus infection among residents with diabetes in a skilled nursing facility. *Infect Control Hosp Epidemiol* 2002;23:313–8.
9. CDC. Recommendations for preventing transmission of infections among chronic hemodialysis patients. *MMWR* 2001;50(No. RR-5).
10. Brown AF, Mangione CM, Saliba D, Sarkisian CA; California Healthcare Foundation/American Geriatrics Society Panel on Improving Care for Elders with Diabetes. Guidelines for improving the care of the older person with diabetes mellitus. *J Am Geriatr Soc* 2003;51:S265–80.

Do you have patients who are HBsAg-positive?

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

The FDA licenses four medications for treatment in the U.S. They are interferon alfa-2b (administered subcutaneously); and adefovir dipivoxil, entecavir, and lamivudine (administered orally).

Consult a liver specialist experienced in the treatment of viral hepatitis for appropriate monitoring guidelines and for help in determining which of your patients might benefit from treatment.

Vaccine Storage and Handling

Additional materials on vaccine handling and storage are available on IAC's website at www.immunize.org/free.

For a ready-to-copy 8 1/2" x 11" version of this piece, go to www.immunize.org/catg.d/p3035chk.pdf.

For a ready-to-copy 8 1/2" x 11" version of this piece, go to www.immunize.org/catg.d/p3036.pdf.

Checklist for Safe Vaccine Handling and Storage

Here are the 20 most important things you can do to safeguard your vaccine supply. Are you doing them all? Reviewing this list can help you improve your clinic's vaccine management practices.

- | | | |
|-----|-----|--|
| Yes | No | |
| ___ | ___ | 1. We have a designated person in charge of the handling and storage of our vaccines. |
| ___ | ___ | 2. We have a back-up person in charge of the handling and storage of our vaccines. |
| ___ | ___ | 3. A vaccine inventory log maintained that documents:
___ Vaccine name and number of doses received
___ Date the vaccine was received
___ Arrival condition of vaccine
___ Vaccine manufacturer and lot number
___ Vaccine expiration date |
| ___ | ___ | 4. Our refrigerator for vaccines is either household-style or commercial-style, NOT dormitory-style. The freezer compartment has a separate exterior door. |
| ___ | ___ | 5. We do NOT store any food or drink in the refrigerator or freezer. |
| ___ | ___ | 6. We store vaccines in the middle of the refrigerator or freezer, and NOT in the door. |
| ___ | ___ | 7. We stock and rotate our vaccine supply so that the newest vaccine of each type (with the longest expiration date) is placed behind the vaccine with the shortest expiration date. |
| ___ | ___ | 8. We check vaccine expiration dates and we first use those that will expire soonest. |
| ___ | ___ | 9. We post a sign on the refrigerator door showing which vaccines should be stored in the refrigerator and which should be stored in the freezer. |
| ___ | ___ | 10. We always keep a thermometer in the refrigerator. |
| ___ | ___ | 11. The temperature in the refrigerator is maintained at 35–46°F (2–8°C). |
| ___ | ___ | 12. We keep extra containers of water in the refrigerator to help maintain cold temperatures. |
| ___ | ___ | 13. We always keep a thermometer in the freezer. |
| ___ | ___ | 14. The temperature in the freezer is maintained at +5°F (-15°C) or colder. |
| ___ | ___ | 15. We keep ice packs and other ice-filled containers in the freezer to help maintain cold temperatures. |
| ___ | ___ | 16. We post a temperature log on the refrigerator door on which we record the refrigerator and freezer temperatures twice a day—first thing in the morning and at clinic closing time—and we know whom to call if the temperature goes out of range. |
| ___ | ___ | 17. We have a "Do Not Unplug" sign next to the refrigerator's electrical outlet. |
| ___ | ___ | 18. In the event of a refrigerator failure, we take the following steps:
___ We assure that the vaccines are placed in a location with adequate refrigeration.
___ We mark exposed vaccines and separate them from undamaged vaccines.
___ We note the refrigerator or freezer temperature and contact the vaccine manufacturer or state health department to determine how to handle the affected vaccines.
___ We follow the vaccine manufacturer's or health department's instructions as to whether the affected vaccines can be used, and, if so, we mark the vials with the revised expiration date provided by the manufacturer or health department. |
| ___ | ___ | 19. We have obtained a detailed written policy for general and emergency vaccine management from our local or state health department. |
| ___ | ___ | 20. If all above answers are "yes," we are patting ourselves on the back. If not, we have assigned someone to implement needed changes! |

Immunization Action Coalition • 1573 Selby Avenue • St. Paul, MN 55104 • (651) 647-9009 • www.immunize.org

Don't Be Guilty of These Errors in Vaccine Storage and Handling

The following are frequently reported errors in vaccine storage and handling. Some of these errors are much more serious than others, but none of them should occur. Be sure your clinic or practice is not making errors such as these.

Error #1: Designating only one person in the office to be responsible for storage and handling of vaccines, instead of a minimum of two.

It's important to train at least one back-up person to learn proper storage and handling of vaccines. The back-up person should be familiar with all aspects of vaccine storage and handling, including knowing how to handle vaccines when they arrive, how to properly record refrigerator and freezer temperatures, and what to do in case of an equipment problem or power outage.

Error #2: Recording temperatures only once per day.

Temperatures fluctuate throughout the day. Temperatures in the refrigerator and freezer should be checked at the beginning and end of the day to determine if the unit is getting too cold or too warm. Ideally, you should have continuous thermometers that measure and record temperatures all day and all night. A less expensive alternative is to purchase maximum/minimum thermometers. Only certified thermometers should be used for vaccine storage. It's also a good idea to record the room temperature on your temperature log in case there is a problem with the refrigerator or freezer temperature. This information may be helpful to the vaccine company's telephone consultant in ascertaining whether your vaccine can still be used.

Error #3: Recording temperatures for only the refrigerator or freezer.

If your facility administers varicella vaccine or live attenuated influenza vaccine (LAIV), you should have certified thermometers in both the refrigerator and the freezer. Rather than buying cheap thermometers that may not accurately measure the temperature, buy quality thermometers that will last for years.

Error #4: Documenting out-of-range temperatures on vaccine temperature logs and not taking action.

Documenting temperatures is not enough. Acting on the information is even more important. So, what should you do? Notify your supervisor whenever you have an out-of-range temperature. Safeguard your vaccines by moving them to another location and then determine if they are still usable. Check the condition of the unit for problems. Are the seals tight? Is there excessive dirt or dust on the coils? After you have made the adjustment, document the date, time, temperature, what the problem was, the action you took, and the results of the action. Recheck the temperature every two hours. Call maintenance or a repair person if the temperature is still out of range.

Error #5: Throwing away temperature logs at the end of every month.

It's important that you keep your temperature logs for at least three years. As the refrigerator ages, you can track recurring problems. If temperatures have been documented out of range, you can determine how long this has been happening and take appropriate action. It's also a great way to lobby for a new refrigerator.

Error #6: Storing vaccine in the refrigerator in a manner that may inappropriately affect its temperature.

The temperature in the vegetable bins, on the floor, next to the walls, in the door, and near the cold air outlet from the freezer may differ significantly from the temperature in the body of the refrigerator. Always store vaccines in their original packaging in the body of the refrigerator away from these locations. Place vaccine packages in such a way that air can circulate around the compartment. Never overpack a refrigerator compartment.

Error #7: Storing frozen vaccines in a dorm-style refrigerator.

Varicella and LAIV must be stored in a freezer that has its own external door separate from the refrigerator. No matter how hard you try to adjust the temperature to +5°F in a dorm-style refrigerator's freezer, you won't be able to reach this low temperature in the freezer, and you'll probably freeze the rest of your vaccines in the refrigerator!

Error #8: Inadvertently leaving the refrigerator or freezer door open or having inadequate seals.

Remind staff to close the unit doors tightly each time they open them. Also, check the seals on the doors on a regular schedule, and if there is any indication the door seal may be cracked or not sealing properly, have it replaced. The cost of replacing a seal is much less than replacing a box of pneumococcal conjugate or varicella vaccine.

Error #9: Discarding multi-dose vials 30 days after they are opened.

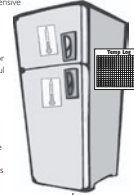
Don't discard your vaccines prematurely. Almost all multi-dose vials of vaccine contain a preservative and can be used until the expiration date printed on the vial unless there is visible contamination. However, you must discard multi-dose vials of reconstituted vaccine (e.g., meningococcal, yellow fever) if they are not used within a defined period after reconstitution. Refer to the vaccine package inserts for additional information.

Error #10: Not having emergency plans for a power outage or natural disaster.

Every clinic should have a written Disaster Recovery Plan that identifies a refrigerator with a back-up generator in which to store vaccine in the event of a power outage or natural disaster. Consider contacting a local hospital or similar facility to be your back-up location if you should need it.

Error #11: Storing food and drinks in the vaccine refrigerator.

Frequent opening of the refrigerator door to retrieve food items can adversely affect the internal temperature of the unit and damage vaccines.



Immunization Action Coalition • 1573 Selby Avenue • St. Paul, MN 55104 • (651) 647-9009 • www.immunize.org

For a ready-to-copy 8 1/2" x 11" version of this piece, go to www.immunize.org/catg.d/p3048.pdf.

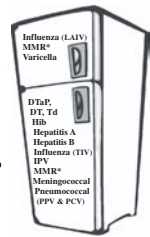
For a ready-to-copy 8 1/2" x 11" version of this 2-page piece, go to www.immunize.org/catg.d/p3039.pdf. (For Celsius, go to www.immunize.org/news.d/celsius.pdf.)

Vaccine Handling Tips

Outdated or improperly stored vaccines won't protect patients!

Maintain freezer temperature at 5°F (-15°C) or colder

Maintain refrigerator temperature at 35–46°F (2–8°C)



Order vaccine carefully.
Inventory your vaccine at least monthly and before placing an order. Expired vaccine must never be used and is money wasted!

Store vaccine correctly!
Refrigerate or freeze immediately upon receiving shipment. Do not store vaccine in the door of the refrigerator or freezer. Inactivated vaccines should always be placed in the middle of the refrigerator far enough away from the freezer compartment to protect them from freezing.

Always use the vaccine with the earliest expiration date first.
Move vaccine with the earliest expiration date to the front and mark it to be used first. Keep vials in their boxes. Never use outdated vaccine.

*MMR may be stored in either the freezer or the refrigerator.

Refer to package insert for specific instructions on the storage of each vaccine. If you have questions about the condition of the vaccine, you should immediately place the vaccine in recommended storage and call the vaccine manufacturer(s) to determine whether the potency of the vaccine(s) has been affected. For other questions, call the immunization program at your state or local health department.

Record your health department's phone number here: _____

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

www.immunize.org/catg.d/p3048.pdf • Item #P3048 (11/03)

Immunization Action Coalition • 1573 Selby Avenue • St. Paul, MN 55104 • (651) 647-9009 • www.immunize.org

Temperature Log for Vaccines (Fahrenheit)

Month/Year: _____ Days 1–15

*Instructions: Place an "X" in the box that corresponds with the temperature. The hatched zones represent unacceptable temperature ranges. If the temperature recorded in the hatched zone: 1. Store the vaccine under proper conditions as quickly as possible. 2. Call the vaccine manufacturer(s) to determine whether the potency of the vaccine(s) has been affected. 3. Call the immunization program at your local health department for further assistance. _____

Document the action taken on the reverse side of this log.

Day of Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Room Temp															
Refrigerator Temperature															
Freezer Temp															
Room Temp															
Refrigerator Temperature															
Freezer Temp															

Immunization Action Coalition • 1573 Selby Avenue, Ste. 234 • St. Paul, MN 55104 • (651) 647-9009 • www.immunize.org • admin@immunize.org

Temperature Log for Vaccines (Fahrenheit)

Month/Year: _____ Days 16–31

*Instructions: Place an "X" in the box that corresponds with the temperature. The hatched zones represent unacceptable temperature ranges. If the temperature recorded in the hatched zone: 1. Store the vaccine under proper conditions as quickly as possible. 2. Call the vaccine manufacturer(s) to determine whether the potency of the vaccine(s) has been affected. 3. Call the immunization program at your local health department for further assistance. _____

Document the action taken on the reverse side of this log.

Day of Month	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Room Temp																
Refrigerator Temperature																
Freezer Temp																
Room Temp																
Refrigerator Temperature																
Freezer Temp																

Immunization Action Coalition • 1573 Selby Avenue, Ste. 234 • St. Paul, MN 55104 • (651) 647-9009 • www.immunize.org • admin@immunize.org

