Hepatitis B and the health care worker

CDC answers frequently asked questions about how to protect health care workers

Editor's note: The Immunization Action Coalition thanks Linda A. Moyer, RN, epidemiologist, and Eric E. Mast, MD, medical epidemiologist, both from the Division of Viral Hepatitis, National Center for Infectious Diseases, Centers for Disease Control and Prevention, for reviewing and updating the following questions and answers about hepatitis B and the health care worker.

You may need more shots than just hepatitis B! To find which ones, read the ACIP statement "Immunization of Health-Care Workers."

It's available online at ftp://ftp.cdc.gov/pub/Publications/mmwr/rr/rr4618.pdf or by calling CDC's National Immunization Information Hotline at (800) 232-2522

Which workers in the health care setting need hepatitis B vaccine?

Health care workers (HCWs) who have a reasonable expectation of being exposed to blood on the job should be offered hepatitis B vaccine. This does not include receptionists, clerical and billing staff, etc., as these individuals are not expected to be at risk for blood exposure.

What is the appropriate administration site for hepatitis B vaccine and what needle size should be used?

A deep intramuscular (IM) injection into the deltoid muscle is recommended for adult hepatitis B vaccination. A 22–25 gauge, 1–1½" needle should be used, but a longer needle may be needed to reach deep into the muscle of obese persons.

If a HCW's only dose of hepatitis B vaccine was four months ago, should the series be restarted?

No. The hepatitis B vaccine series should not be restarted when doses are delayed; rather, the series should be continued from where it left off. The vaccine recipient should receive the second dose of vaccine now and the third dose 2–5 months later.

Is it safe for HCWs to be vaccinated during pregnancy?

Yes. Pregnant women in occupations with a high risk of hepatitis B virus (HBV) infection (e.g., HCWs who have a potential for exposure to blood) should be vaccinated. Hepatitis B vaccine contains no components that have been shown to pose a risk to the fetus at any time during gestation. An acute (or chronic) HBV infection in a pregnant woman poses a significant risk to the fetus or newborn for perinatal or *in utero* infection.

Which HCWs need serologic testing after receiving 3 doses of hepatitis B vaccine?

All HCWs should have serologic testing 1–2 months following the final dose of the hepatitis B vaccine series. An anti-HBs serologic test result of ≥10mIU/mL indicates immunity. No further routine doses or testing are indicated.

What should be done if a HCW's serologic test (anti-HBs) is negative 1–2 months after the last dose of vaccine?

You should repeat the 3-dose series and then test for anti-HBs 1–2 months after the last dose of vaccine. If the HCW is still negative after the second vaccine series, the HCW is considered a non-responder to hepatitis B vaccination. The HCW should be counseled that non-response to the vaccination series most likely means the HCW is susceptible to HBV infection. The HCW should then be counseled to discuss what non-response to the vaccination series means for that specific HCW and what steps should be taken in the future to protect his/her health. It is also possible that the non-responder is chronically infected with HBV. HBsAg testing can be offered or suggested to determine if this is the case. HBsAg test results should remain confidential.

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Recommended postexposure prophylaxis for exposure to hepatitis B virus

Vaccination and antibody response status of exposed workers*	Treatment		
	Source HBsAg† positive	Source HBsAg negative	Source unknown or not available for testing
Unvaccinated	HBIG§ x 1 and initiate HB vaccine series¶	Initiate HB vaccine series	Initiate HB vaccine series
Previously vaccinated			
Known responder**	No treatment	No treatment	No treatment
Known nonresponder††	HBIG x 1 and initiate revaccination or HBIG x 2§§	No treatment	If known high risk source, treat as if source were HBsAg positive
Antibody response unknown	Test exposed person for anti-HBs¶¶ 1. If adequate,** no treatment is necessary 2. If inadequate,†† administer HBIG x 1 and vaccine booster	No treatment	Test exposed person for anti-HBs 1. If adequate,** no treatment is necessary 2. If inadequate,†† administer vaccine booster and recheck titer in 1–2 months

* Persons who have previously been infected with HBV are immune to reinfection and do not require postexposure prophylaxis.
† Hepatitis B surface antigen
§ Hepatitis B immune globulin; dose is 0.06 mL/kg intramuscularly.
¶ Hepatitis B vaccine
**A responder is a person with adequate levels of serum antibody to HBsAg (i.e., anti-HBs ≥10 mIU/mL).
††A nonresponder is a person with inadequate response to vaccination (i.e., serum anti-HBs <10 mIU/mL).
§§The option of giving one dose of HBIG and reinitiating the vaccine series is preferred for nonresponders who have not completed a second 3-dose vaccine series. For persons who previously completed a second vaccine series but failed to respond, two doses of HBIG are preferred.
¶¶ Antibody to HBsAg

Source: "Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis," MMWR, *June 29, 2001, Vol. 50 (RR-11): 22*

www.immunize.org/catg.d/2109hcw.pdf • Item #P2109 (10/03, reviewed 1/05)

How often should I test health care workers after they've received the hepatitis B vaccine series to make sure they're protected?

Postvaccination testing should be done 1–2 months after the last dose of hepatitis B vaccine.

If adequate anti-HBs is present (≥10mIU/mL), nothing more needs to be done. Periodic testing or boosting is not needed. If the postvaccination test result is less than 10 mIU/mL, the vaccine series should be repeated and testing done 1–2 months after the second series. This information should be recorded in the person's health record.

Should a HCW who performs invasive procedures and who once had a positive anti-HBs result be revaccinated if the anti-HBs titer is rechecked and is <10mIU/mL?

No. Postvaccination testing needs to be done only once at 1–2 months after the vaccine series is completed. If a HCW's test result indicated protection (anti-HBs ≥10mIU/mL) as a result of the original vaccination series, no further serologic testing is indicated. Data show that adequate response to the 3-dose series of hepatitis B vaccine provides long-term immunologic memory that gives long-term protection. Only immunocompromised persons (e.g., hemodialysis patients, HIV-positive persons) need to have anti-HBs testing and booster doses of vaccine to maintain their anti-HBs concentrations of at least 10mIU/mL to be protected against HBV infection.

If HCWs were vaccinated for hepatitis B in the past and not tested for immunity, should they be tested now?

No. In this scenario, a HCW does not need to be tested unless he or she has an exposure. If an exposure occurs, refer to the table on the first page for management guidelines. In addition to following these guidelines, if prophylaxis (HBIG and a booster dose of vaccine) is indicated, the person should receive postvaccination testing 3–6 months afterwards. It is necessary to do postvaccination testing at 3–6 months because testing earlier may only measure antibody from HBIG. This postvaccination test result should be recorded in the person's health record.

Several physicians in our group have no documentation showing they received hepatitis B vaccine. However, they are relatively sure they received the doses many years ago. What do we do now?

Unfortunately, inadequate documentation of vaccination is common. Even if these physicians think they may have been fully vaccinated, but it is not documented, the three-dose vaccination series should be administered. Postvaccination testing should be performed 1–2 months after the three-dose series. There is no harm in receiving extra doses of vaccine.

Some might suggest giving only one dose of vaccine followed by postvaccination testing. Although 30% of previously unvaccinated healthy adults will have a protective antibody response after only one dose of vaccine, these individuals will not have the long-term protection afforded by the three-dose series.

Each organization (hospital, clinic, etc.) should develop policies or guidelines about the documentation required to demonstrate valid hepatitis B vaccination. If policies are in place and documentation is not present, revaccination should be instituted. Care should always be taken to document vaccine lot, date, manufacturer, route, and vaccine dosages. Postvaccination testing results should also be documented, including the date serologic testing was performed.

I'm a nurse who received the hepatitis B vaccine series over 10 years ago and had a positive follow-up titer. At present, my titer is negative. What should I do now?

You don't need to do anything further. Current data show that vaccine-induced anti-HBs levels may decline over time; however, immune memory (anamnestic anti-HBs response) remains intact indefinitely following immunization. Persons with declining antibody levels are still protected against clinical illness and chronic disease. For health care workers with normal immune status who have demonstrated an anti-HBs response following vaccination, booster doses of vaccine are not recommended nor is periodic anti-HBs testing.

A person who is a known non-responder to hepatitis B vaccine has a percutaneous exposure to HBsAg-positive blood. According to the ACIP recommendations, I have the option to give hepatitis B immune globulin (HBIG) x 2 or HBIG x 1 and initiate revaccination. How do I decide which to do?

If the person is a true non-responder (i.e., failed to produce adequate anti-HBs after two full vaccine series), it seems illogical to give a third hepatitis B vaccine series. The two-dose HBIG regimen would be the better choice. The first dose of HBIG (0.06mL/kg) should be given as soon as possible after exposure and the second dose (same dosage) given one month later. If the person has failed only one hepatitis B vaccine series, the second option (HBIG x 1 and initiate revaccination) should be used. Postvaccination testing with anti-HBs should be done 1–2 months after the second series of vaccine.

If an employee does not respond to hepatitis B vaccination, does s/he need to be removed from activities that expose her/him to blood-borne pathogens? Does the employer have a responsibility in this area beyond providing the vaccine? Where can I get further information on this subject?

No regulations demand removal from the job situations described. It is up to each organization to develop a policy concerning non-responders. The Occupational Safety and Health Administration (OSHA) requires that employees in jobs where there is a reasonable risk of exposure to blood be offered hepatitis B vaccine. In addition, the regulation states that adequate personal protective equipment be provided and that standard precautions be followed. Check with your state OSHA regarding more stringent requirements. If there is no state OSHA, federal OSHA regulations should be followed. Adequate documentation should be placed in the employee record regarding non-response to vaccination. The employee should be counseled that non-response to the vaccination series most likely means the employee is susceptible to HBV infection, and if an exposure to HBV occurs, HBIG should be used for postexposure prophylaxis. HBsAg testing should be recommended as it is possible the employee is chronically infected with HBV. The employee should then be counseled to discuss what non-response to the vaccination series means for her/him and what steps should be taken in the future to protect her/his health.

Does being chronically infected with HBV preclude one from becoming a health professional?

No. All health professionals should practice standard precautions. However, there is one caveat concerning HBV-infected health professionals. Those who are HBsAg-positive and HBeAg-positive should not perform exposure-prone invasive procedures (e.g., gynecologic, cardiothoracic surgery) unless they have been counseled by an expert review panel and been advised under what circumstances, if any, they may perform these procedures.

Such circumstances might include notifying prospective patients of the health professional's seropositivity before they undergo exposure-prone invasive procedures. For more information on this issue, see the 1991 *MMWR Recommendations and Report* "Recommendations for Preventing Transmission of Human Immunodeficiency Virus and Hepatitis B Virus to Patients During Exposure-Prone Invasive Procedures." This CDC document is available at www.cdc.gov/mmwr/preview/mmwrhtml/00014845.htm

Keep your own vaccination history!

Record the dates you received hepatitis B vaccine, as well as the results of your postvaccination serologic testing (anti-HBs).

Remember to save records of any vaccinations you receive so you don't have to repeat them.

To order adult immunization record cards, visit www.immunize.org/adultizcards