



In This Issue:

Prevention of Hepatitis B:

- ◆ Strategies to Eliminate Hepatitis B Virus Transmission
- ◆ Perinatal Hepatitis B Prevention

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Telephone (775) 328-2447

Fax (775) 328-3764

epicenter@washoecounty.us

WASHOE COUNTY HEALTH DISTRICT • P.O. BOX 11130 • RENO, NEVADA • 89520-0027 • (775) 328-2447



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Prevention of Hepatitis B: Immunization Strategies & Perinatal Hepatitis B Prevention

Background

Hepatitis B virus (HBV) is a bloodborne and sexually transmitted virus. Although rates of new infection and acute disease are highest among adults, chronic infection is more likely to occur in persons infected as infants or young children. Before hepatitis B vaccination programs became routine in the United States, an estimated 30%–40% of chronic infections are believed to have resulted from perinatal or early childhood transmission, even though <10% of reported cases of hepatitis B occurred in children aged <10 years. Chronic infection occurs in approximately:

- ◆ 90% of infected infants,
- ◆ 30% of infected children aged <5 years, and
- ◆ <5% of infected persons aged \geq 5 years.

Chronically infected persons are at increased lifetime risk for cirrhosis and hepatocellular carcinoma (HCC) and also serve as the main reservoir for continued HBV transmission. Data from follow-up studies of persons infected with HBV as infants or young children indicate approximately 25% of those with chronic infection die prematurely from cirrhosis or liver cancer.

Strategies to Eliminate HBV Transmission

The Advisory Committee on Immunization Practices (ACIP) recommends the following immunization strategies to eliminate transmission of HBV infection in the U.S.:

- ◆ Universal vaccination of infants beginning at birth
- ◆ Prevention of perinatal HBV infection through:
 - Routine screening of all pregnant women for hepatitis B surface antigen (HBsAg), and
 - Immunoprophylaxis of infants born to HBsAg-positive women and infants born to women with unknown HBsAg status
- ◆ Routine vaccination of previously unvaccinated children and adolescents
- ◆ Vaccination of previously unvaccinated adults at increased risk for infection

A main focus is on universal infant vaccination beginning at birth, which provides a “safety net” for prevention of perinatal infection, prevents early childhood infections, facilitates implementation of universal vaccination recommendations, and prevents infections in adolescents and adults.

Perinatal Hepatitis B Prevention

Mandatory hepatitis B screening of all pregnant women and reporting of HBsAg-positive pregnant women prior to delivery are important components of the Washoe County Health District's (WCHD) Perinatal Hepatitis B Prevention Program (PHBPP). Since its inception over two decades ago, the goal of the program has been to prevent perinatal transmission of hepatitis B by assuring timely and appropriate post-exposure prophylaxis (PEP) for infants born to HBsAg-positive women in Washoe County.

Nevada Revised Statute (NRS) 441A.570 requires that *a pregnant woman shall be screened by her health care provider for the presence of hepatitis B surface antigen. The health care provider shall refer a pregnant woman who is positive for hepatitis B surface antigen to the health authority for counseling and recommendations on testing and immunizing contacts.*

ACIP guidelines for prevention of perinatal HBV infection and management of pregnant women include the following:

- ◆ All pregnant women should be tested routinely for HBsAg during an early prenatal visit (e.g., first trimester) **in each pregnancy, even if they have been previously vaccinated or tested.**
- ◆ In addition, the following groups should be tested at the time of admission to the hospital for delivery:
 - women who were not screened prenatally,
 - women who engage in behaviors that put them at high risk for infection (e.g., injection drug use, having had more than one sex partner in the previous 6 months or a HBsAg-positive sex partner, evaluation or treatment for a sexually transmitted disease, or recent or current injection drug use), and
 - women with clinical hepatitis.
- ◆ HBsAg-positive pregnant women should be referred to an appropriate case-management program for education and follow-up. In Washoe County please call the Communicable Disease Program at **775-328-2447** to make a referral.
- ◆ HBsAg-positive pregnant women should be provided with or referred for appropriate counseling and medical management.

Please share this document with all physicians & staff in your facility/office.

In order to ensure appropriate and timely PEP of perinatally exposed infants, all HBsAg-positive pregnant women must be reported to the Communicable Disease Program prior to delivery. **HBsAg-positive persons can be reported by using the confidential fax line at (775) 328-3764.** The majority of HBsAg-positive reports originate from the laboratory completing the prenatal labs. *This means that most health care providers inappropriately rely exclusively upon the laboratories to submit these reports for them.* It is possible for a case to be missed, especially if an HBsAg-positive woman moves to this community after having her prenatal testing done by a provider outside of Washoe County. Although her medical record may follow her in the transfer of care, the HBsAg-positive result will not be reported to the WCHD unless the health care provider takes the initiative to do so.

NRS 441A.570 also states *the health care provider of an infant born to a woman carrying hepatitis B surface antigen shall ensure that the infant is given hepatitis B immune globulin [HBIG] and hepatitis B vaccine within 12 hours of birth with the vaccine series being completed on a schedule established by the division.*

ACIP provides the following recommendations for the management of infants born to HBsAg-positive women:

- ◆ All infants born to HBsAg-positive women should receive single-antigen hepatitis B vaccine and HBIG (0.5mL) within 12 hours of birth.
- ◆ The vaccine series should be completed according to the following schedules:
 - **If only single-antigen vaccine is used:** Dose 2 at 1-2 months; Dose 3 at 6 months.
 - **If single-antigen vaccine at birth + combination vaccine for subsequent doses:** Dose 2 at 2 months, Dose 3 at 4 months, Dose 4 at 6 months (if Pediarix), or at 12-15 months (if Comvax).
- ◆ Postvaccination testing for hepatitis B surface antibody (anti-HBs) and HBsAg should be performed after completion of the vaccine series, at age 9-18 months. Testing should not be performed before 9 months of age to avoid detection of anti-HBs administered during infancy and to maximize the likelihood of detecting late HBV infection. Hepatitis B core antibody total (anti-HBc) testing of infants is not recommended because passively acquired maternal anti-HBc might be detected in infants born to HBV infected mothers up to age 24 months.
- ◆ Infants of HBsAg-positive mothers may be breast fed beginning immediately after birth.

All delivery hospitals should implement policies and procedures to ensure:

- 1) identification of infants born to HBsAg-positive mothers and infants born to mothers with unknown HBsAg status, and
- 2) initiation of immunization for these infants.

Case management of HBsAg-positive pregnant women and their infants by WCHD's PHBPP includes:

- ◆ Contact of the health care provider to obtain pertinent information regarding the case.
- ◆ Interview of the case to identify contacts and provide appropriate HBV education, including:
 - modes of transmission;
 - perinatal concerns (e.g., infants born to HBsAg-positive mothers may be breast fed);
 - prevention of HBV transmission to contacts, including the importance of postexposure prophylaxis for the newborn infant and hepatitis B vaccination for household, sexual, and needle-sharing contacts;
 - substance abuse treatment, if appropriate; and
 - medical evaluation and possible treatment of chronic hepatitis B.
- ◆ Evaluation of identified household, sexual, and needle-sharing contacts of HBsAg-positive women to determine need for serologic screening with referral for same if indicated; referral of susceptible contacts to complete the three-dose vaccination series.
- ◆ Referral of sexual partners to complete post-vaccination testing to verify adequate immune response.
- ◆ Notification of the delivery hospital approximately two to three months prior to the expected delivery date to ensure the hospital health care providers are aware the infant will need HBIG and first dose of hepatitis B vaccine within 12 hours of birth.
- ◆ Continuation of follow-up until the infant completes the hepatitis B vaccination series and is then screened at 9 to 18 months of age to verify adequate anti-HBs response and absence of HBsAg. This indicates the infant did not develop hepatitis B infection and is now immune.

Due to the length of follow-up required on infants born to HBsAg-positive women, the last year for which complete data is available is 2009. In Washoe County in 2009, 16 infants born to HBsAg-positive women were reported to the PHBPP. All 16 infants received PEP with HBIG and their first dose of hepatitis B vaccine within 12 hours of birth. Of the 16 infants, one moved out of the area prior to completing the hepatitis B vaccine series. Of the 15 infants remaining, all 15 completed the hepatitis B vaccination series and were post-vax tested as recommended. All 15 were HBsAg-negative and anti-HBs-positive indicating the PEP was effective.

Laboratories, hospitals and health care providers must report all HBsAg-positive test results promptly to the local health authority. In Washoe County reports should be faxed to the **Communicable Disease Program** confidential reporting line at **775-328-3764**. For more information, please contact the Communicable Disease Program at (775) 328-2447.

Adapted from: Centers for Disease Control and Prevention. A comprehensive immunization strategy to eliminate transmission of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices (ACIP); Part 1: Immunization of Infants, Children, and Adolescents. MMWR 2005;54(No. RR-16), available on-line at: <http://www.cdc.gov/mmwr/PDF/rr/rr5416.pdf>.