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Overview

The Hepatitis B virus (HBV) is a blood-borne pathogen that is transmitted through percutaneous and/or mucosal exposure to infected blood or body fluids. HBV is spread when blood or body fluids from an infected person enters the body of a person who is not infected.

Common avenues of transmission include: having sex with an infected person without using a condom, by sharing drugs via needles, or other paraphernalia that can become contaminated with infected blood, through occupational needle sticks or sharps exposures, from an infected mother to her baby during birth, and through household exposures to the blood or body fluids of an infected person. Hepatitis B is not spread through food or water, sharing eating utensils, breastfeeding, hugging, kissing, coughing, sneezing or by casual contact. Saliva is a lesser avenue of HBV transmission, but is possible through deep bites or deep rigorous kissing when blood exchange occurs through bleeding gums, oral lesions, or when oral trauma occurs from dental appliances or braces. HBV is NOT contracted by eating food prepared by someone who is infected. Transmission through tears, sweat, urine, stool, or droplet nuclei are not likely. It is important to remember that HBV is a hardy organism and can survive on environmental surfaces for seven days in blood or body fluid visible or invisible in microscopic particles of dried blood present on commonly shared household items such as; nail clippers, tooth brushes, metal nail files, pierced body jewelry, and other sharp items. A person infected with HBV may transmit the infection to others who have not been protected against hepatitis B by immunization or previous infection with recovery.

After HBV enters the body and the blood stream, it migrates to and invades the liver cells. Once inside the liver cells, HBV reproduces rapidly and causes liver cell damage. The immune system recognizes the virus as foreign and launches an immune response to try to rid the virus from the body by attacking the infected liver cells. This results in inflammation and scarring of the liver tissues, which interferes with the liver's ability to function properly. Over time, reported liver scarring can result in cirrhosis and the liver's internal architecture changes. These changes interfere with the liver's ability to function properly.

Many people have no noticable symptoms associated with HBV infection and feel fine. Only about half of the number of adults acutely infected with HBV ever exhibit symptoms, and children are not as likely to develop symptoms. Symptoms may include malaise, anorexia, nausea and vomiting, right upper quadrant abdominal pain, fever, headache, myalgia, skin rashes, arthalgia, arthritis, and dark urine beginning before the onset of jaundice.

Acute Hepatitis B

The clinical course for acute HBV infection is generally self limiting and typically lasts six to nine months. The onset of hepatitis B is generally insidious. The incubation period may begin as early as 7 days and continue up to 180 days, but usually falls within a 60 to 90 day range. Near the end of the incubation period or early in the course of acute infection, replicative viral activity is detectable by the presence of hepatitis B surface antigen (HBsAg) in the blood about 1 to 10 weeks after exposure and before outward symptoms appear. HBsAg is the first viral marker to appear in the blood following infection. Other viral markers, hepatitis B envelope antigen (HBeAg) and hepatitis B virus deoxyribonucleaic acid (HBV-DNA) are detectable in the blood about this same time. Once the body's immune system recognizes the hepatitis B virus as foreign to the body, it launches an immune response to fight and clear the virus by developing antigen specific antibodies. About 1 month after the appearance of HBsAg in the blood, and before the onset of symptoms, anti-HBc, an antibody that develops in response to the hepatitis B core antigen, becomes detectable in the blood.

Symptoms when present, may surface as early as 8 weeks from exposure and persist through 24 weeks or longer. A prodromal phase may be apparent and include flu-like symptoms, fever, nausea, loss of appetite, vomiting, joint pain, fatigue, and/or right upper abdominal pain that begins about 2 weeks after exposure and ends with the appearance of jaundice. When a vigorus immune response occurs, HBsAg may be cleared quickly from the blood by neutralizing anti-HBs antibodies that confer immunity. The jaundice or icteric phase begins about 1 to 2 weeks after the prodromal phase. The urine may become dark and the stools may become light or clay-colored before the onset of jaundice. The liver may be enlarged and tender. Pain may be experienced when the abdomen over the liver is pressed or palpated. Serum bilirubin levels increase during this time and jaundice generally lasts 2 to 6 weeks, but may last longer. Mild transient itching may accompany the icteric phase. Convalescence begins as the body begins to recover and antibodies to HBsAg develop. Malaise and fatigue may last weeks to months whereas; jaundice, anorexia, and other symptoms disappear.

The recovery phase begins with the resolution of jaundice. Although the liver may still be enlarged and tender, symptoms continue to diminish. In most cases liver function test results return to normal within 2 to 12 weeks after the onset of jaundice. HBsAg levels usually become undetectable within 6 months. About 50% of those acutely infected with HBV are no longer infectious by 15 weeks after onset of symptoms. Within 6 to 9 months most acute HBV infections in adults resolve completely. Symptoms disappear, HBsAg becomes undetectable in the blood, and anti-HBc and anti-HBs become detectable in the blood, signifying immunity and protection against future infection. A person is thought to remain protected as long as their immune system remains competent. It is important to

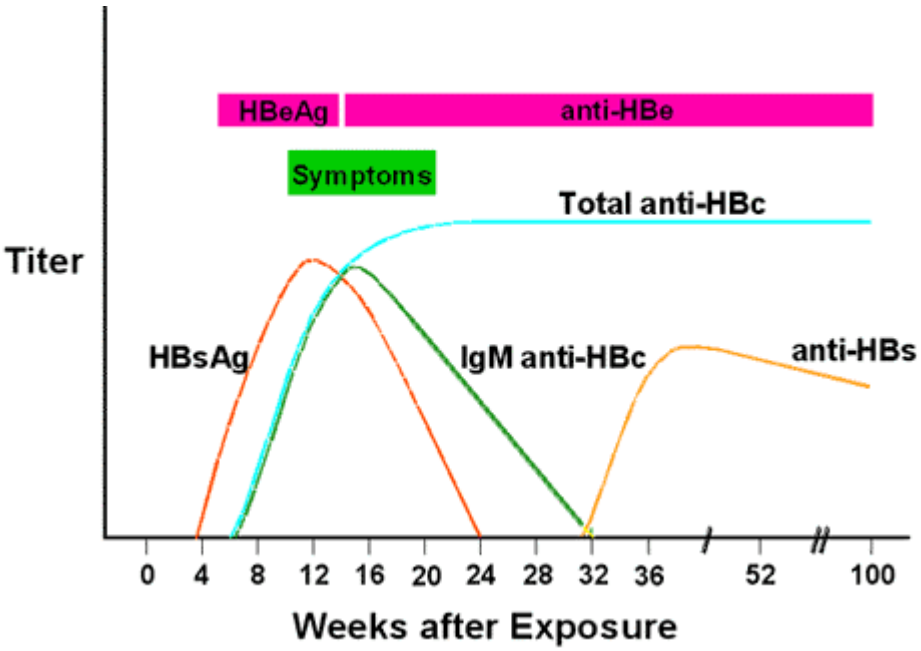
remember that HBV infected infants and children are more likely to develop chronic HBV and may remain asymptomatic. Evidence of infection may not become known until discovered by testing in adulthood, in pregnancy, during routine medical testing, or after significant liver disease has occurred.

Generally the physical, serological, and biochemical markers fall within the following timeframes for uncomplicated acute infection:

- HBsAg, an early marker of infectivity, may develop within 1 week (usually 1 to 10 weeks) of exposure and persist for about 24 weeks
- Viremia or HBV DNA may be detectable 2 weeks from exposure and persist for about 24 weeks
- HBeAg , another early marker of infectivity may develop within 4 weeks of exposure and persist to 24 weeks
- Increased alanine aminotransferase (ALT's) may be detectable about 4 weeks from exposure through about 24 weeks
- Total anti-HBc develops about 6 weeks from exposure in response to the core antigen and may persist through 100 weeks or longer, sometimes indefinitely. This marker provides laboratory evidence that a person is or has been infected with the hepatitis B virus but is not specific to the timeframe of infection. From this test, an additional test can be conducted to evaluate the antibody IgM subclass to determine whether or not the HBV infection is recent (within the past 6 months) or an old infection
    - Anti-HBc IgM may be detectable about 8 weeks and persist to about 32 weeks.
        - Anti-Abc (Total) and Anti-HBc, IgM may be the only viral markers detectable during the core window period between the loss of HBsAg at about 24 weeks and the appearance of Anti-HBs at about 28 weeks
        - Anti-HBc, IgM is **not** usually present in perinatally infected infants
- Clinical illness with the presence of symptoms may occur within 8 weeks and persist up to 24 weeks or longer
- Anti-HBs develops about 28 through 100 weeks

A viral marker interpretation table is available at the end of this section. Below is an illustration of the general serological viral marker progression of acute uncomplicated hepatitis B infection, provided by CDC.

General Serological Viral Marker Progression of Acute Uncomplicated Hepatitis B Infection



Many times it is difficult to know where in the course of infection a person may be, therefore, it is important to recognize the time periods during which a person is likely to be infectious to others. This is generally during the time of HBsAg, HBeAg, HBV-DNA and/or anti-HBc IgM positivity. Those who do not clear the virus as evidenced by sequential HBsAg-positive, or HBV-DNA-positive, or HBeAg-positive results, or any combination of these results 6 months or more apart, are considered chronically infected and remain infectious much longer, possibly for life. HBV infection is vaccine preventable. Completion of a 3 dose series of Hepatitis B vaccination is the most effective measure available to prevent HBV infection and the subsequent untoward health consequences associated with chronic hepatitis B infection.

Chronic Hepatitis B Infection

Chronic HBV infection is the persistence of clinical manifestations and liver inflammation after the acute phase. Liver functions tests may or may not remain abnormal longer than 6 months, but HBsAg persists in the blood. Chronic HBV infection is often responsible for cirrhosis of the liver, liver cancer, liver failure, and death. While rates of infection and acute disease are highest among adults, chronic infection is more likely to occur in those infected as infants or children. Mother-to-child transmission is an extremely effective means of HBV transmission that is progressive to chronic infection. Chronic infection occurs when antigen specific antibodies fail to develop or clear HBsAg, leaving the infected person infectious to others. About 90 % of unprotected infants infected with HBV, and up to 50 % of unprotected young children infected under the age of 5 years will progress to a chronic HBV infection status. Chronic hepatitis B infection is a silent killer because many of those infected do not feel sick even when they have significant liver disease. Symptoms may not be appreciable until extensive cirrhosis or end stage liver cancer/ or disease is present. Chronically infected individuals should be regularly medically monitored for disease progression, need for anti-viral therapy, progress of antiviral therapy and the development of cirrhosis, liver cancer, bleeding issues or other conditions associated with liver disease. HBV associated liver cancer often develops in adulthood between the ages of 35 to 65 years. An individual identified as an asymptomatic "carrier" requires medical monitoring. The term "carrier" is misleading in that it seems to diminish the seriousness of the condition. Asymptomatic HBV infected individuals can still transmit the virus to others.

Regular medical follow-up and monitoring is important. A patient who is chronically infected with HBV should have liver function tests and evaluation for progression of liver disease very 6 months to 1 year. Consultation and care with a hepatology or gastroenterology specialist is recommended. Public health practitioners and primary care providers are encouraged to assist the individuals in making the appropriate connections with specialists when they encounter difficulties accessing these services. The Asian Liver Center at Stanford University has published guidelines for physicians treating patients with chronic HBV infection. Provided below are a few of those recommendations.

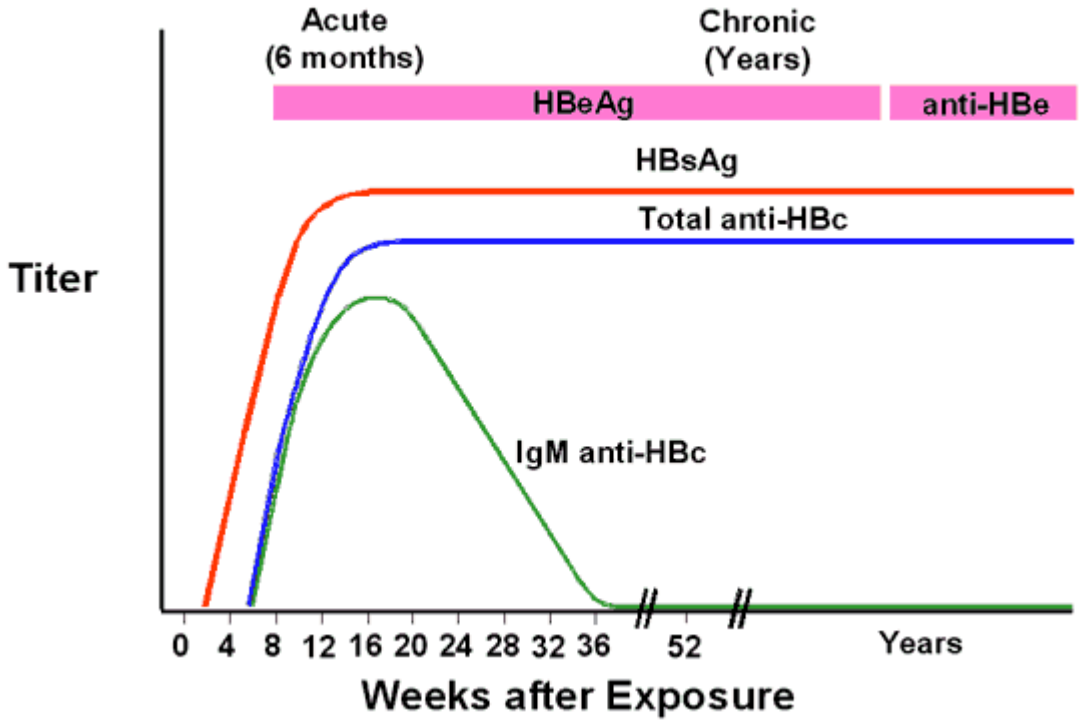
Medical Monitoring Chronic Hepatitis B

1. Measure alanine aminotransferace (ALT) every 6 months to assess whether treatment is appropriate.
2. HBeAg or HBV-DNA testing is widely used to monitor response to treatment. The conversion of anti-HBe from negative (before treatment) to positive (during treatment) is usually an indication of a good response to treatment. This seroconversion may take months to years.
    a. A negative HBeAg and negative HBV-DNA reflects low viral infectivity
    b. HBV-DNA directly measures the hepatitis B viral load, usually expressed in terms of copies per milliliter of blood. A significant drop or loss of HBV- DNA levels is a good measure of treatment response.

3. Measure alpha-fetoprotein (AFP) every 6 months to screen for liver cancer.
4. Obtain an ultrasound every year to screen for liver cancer.
5. Obtain the hepatitis A vaccine if susceptible (anti-HAV-negative) to avoid further damage to the liver.
6. Avoid alcohol, drugs, herbal supplements, and other substances that could potentially damage the liver.
7. Screen and vaccinate susceptible family members as appropriate with hepatitis B vaccine.

See the CDC illustration below of serological viral marker timeline of general uncomplicated chronic hepatitis B.

General Serological Viral Marker Progression of Chronic Uncomplicated Hepatitis B Infection



Public Health Strategies for the Elimination of Hepatitis B

Public health goals are to implement strategies to eliminate the transmission of HBV through prevention measures that focus on identification of those at known risk and offer immunoprophylaxis with Hepatitis B vaccine and, when indicated, hepatitis B human immunoglobulin (HBIG). The hepatitis B vaccination series has been incorporated in the

the standard childhood immunization schedule beginning with a dose at birth. Missouri law supports completion of the hepatitis B vaccination series for daycare and public school entry. HBsAg-positivity in pregnant women is reportable in Missouri to help identify infants born at risk so that immunoprophylaxis is readily available within 12 hours of birth. Hepatitis B immunization is encouraged for all unvaccinated adolescents and adults to reduce HBV transmission.

Prevention Strategies

1. Vaccinate all infants with Hepatitis B vaccine at birth and complete the hepatitis B vaccination series on the recommended schedule.
2. Incorporate the Hepatitis B vaccination series into the routine childhood and adolescent immunization schedule for all infants and children.
3. Avoid unprotected sexual contact with an infected person.
4. Promote consistent and proper condom use to reduce risk of transmission through sexual contact.
5. Educate HBV infected pregnant women about the risk of mother-to-child HBV transmission and the need for immunoprophylasis for their infant (HBIG and Hepatitis B vaccination) within 12 hours of birth to help prevent infection, and post-vaccination serology (HBsAg and anti-HBs) testing for the baby following the third dose of Hepatitis B Vaccine. Post-vaccination serology (HBsAg and anti-HBs) testing should be completed when the infant is at least 9 months of age to avoid detection of anti-HBs from HBIG administered during infancy, to maximize the likelihood of detecting late HBV infection, and to accurately reflect the infant's immunity status, infection status, and the need for further hepatitis B vaccination.
6. Educate parents and health care providers that infants born to HBV-infected mothers should complete the full Hepatitis B vaccine series on the recommended schedule for the best level of protection for the infant against mother-to-child HBV transmission.
7. Raise awareness that Hepatitis B vaccination provides the only definitive protection against the HBV.

Hepatitis B Elimination Strategies

Current Advisory Committee on Immunization Practices (ACIP) published comprehensive strategies to eliminate HBV transmission (see the MMWR Morbidity and Mortality Weekly Report December 23, 2005, *A Comprehensive Immunization Strategy to Eliminate Transmission of Hepatitis B Virus Infection in the United States* at: http://www.cdc.gov/mmwr/PDF/rr/rr5416.pdf).

Summary of recommendations:

1. Implement routine prenatal HBsAg testing for women.
2. Accurately interpret laboratory results.
3. Identify infants born to HBsAg-positive women and provide:
   a. immunoprophylaxis with HBIG and one dose of single-antigen Hepatitis B vaccine within
   twelve (12) hours of birth;
      -Pre-term infants < 2000 grams, born to HBsAg-positive women, should receive a dose of Hepatitis B single-antigen vaccine within 12 hours of birth, but it should not be counted as part of the 3 dose series. The next dose should be administered beginning when the infant reaches age one month, the series completed on the recommended schedule (for a total of 4 doses).
      -Infants born to women whose HBsAg status is unknown and cannot be determined within 12 hours of birth, should receive both single-antigen hepatitis B vaccine and HBIG (0.5ml). If the maternal HBsAg status is determined to be negative prior to 12 hours of birth, the HBIG should not be given.
   b. Follow up to ensure completion of the hepatitis B vaccination series according to the recommended childhood vaccination schedule; and
   c. Post-vaccination serology (HBsAg and anti-HBs) testing, one (1) to two (2) months after the completion of the hepatitis B vaccine series [the infants must be at least nine (9) months of age to avoid detection of anti-HBs from HBIG administered during infancy and to maximize the likelihood of detecting late HBV infection].
4. Identify unvaccinated household contacts, determine their HBV infection status and provide the hepatitis B vaccination series to those who are not immune.
5. Encourage routine hepatitis B vaccination of all infants at birth.
   - Pre-term infants weighing less than 2000 grams, the initial vaccine (birth dose) should not be counted as part of the vaccine series because of the potentially reduced immunogenicity of hepatitis B vaccine in these infants; 3 additional doses of vaccine should be administered beginning when the infant reaches age one month. The series should then be completed on the recommended schedule (for a total of 4 doses).
   - Pre-term infants weighing less than 2000 grams born to HBsAg-negative women should receive the first dose of vaccine 1 month after birth or at hospital discharge.
6. Encourage hepatitis B vaccination of unvaccinated adolescents.
7. Encourage hepatitis B vaccination of unvaccinated adults at high-risk of infection.

Hepatitis B Vaccines

Two manufacturers in the United States produce the Hepatitis B vaccine.

- Merck
- GlaxoSmithKline Pharmaceuticals

Two single-antigen Hepatitis B vaccines

- Recombivax HB® (Merck)
- Engerix-B® (GlaxoSmithKline)

Combination vaccines

- Comvax® (Merck) used for infants aged 6 weeks or older and young children. This vaccine contains:
  - Recombivax HB® (Merck) Hepatitis B vaccine (pediatric dose)
  - PedvacHIB® (Merck) (PRP-OMP) for Haemophilus Influenza Type B vaccine
- Pediarix® (GlaxoSmithKline) are used for infants and young children and contains:
  - Hepatitis B (Engerix-B®) vaccine (GlaxoSmithKline)
  - Diphtheria, tetanus toxoids, acellular pertussis adsorbed, (DTaP) (Infanrix®) vaccine (GlaxoSmithKline)
  - inactivated poliovirus (IPV) vaccine (GlaxoSmithKline)
- Twinrix® (GlaxoSmithKline) - used for adults and contains
  - recombinant (Engerix-B®) Hepatitis B vaccine (GlaxoSmithKline)
  - inactivated Hepatitis A virus (Havrix®) vaccine (GlaxoSmithKline)

See the Current Pink Book – *Epidemiology and Prevention of Vaccine Preventable Diseases* for detailed information regarding immunogenicity, vaccine efficacy, administration, storage, management and schedule, usage and the Serologic Testing of Vaccine Recipients/Pre-vaccination Serologic Testing table (page 205) at: http://www.cdc.gov/nip/publications/pink/hepB.pdf

Also refer to the current ACIP Recommendations (2005) for detailed information on comprehensive immunization strategies to eliminate transmission of Hepatitis B virus infection. This document title is ***A Comprehensive Immunization Strategy to Eliminate Transmission of Hepatitis B Virus Infection in the United States,*** published in the MWR 12/23/05, 54(RR16); pages1-23 and may be viewed at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5416a1.htm?s_cid=rr5416a1_e

Combination Vaccines

Please refer to the above references for the age limits and schedules for combination vaccine usage.

Hepatitis D Delta

Hepatitis D virus (HDV) produces infection only in the presence of hepatitis B infection. HDV can convert an asymptomatic or mild chronic hepatitis B infection into a fulminant, severe or rapidly progressive hepatitis disease. In acute clinical illness, co-infection with HBV and HDV is indistinguishable from hepatitis B infection alone, and the likelihood of fulminant hepatitis is greater [as high as 5%]. HDV can occur at the same time as HBV (co-infection) or it can infect someone already chronically HBV infected (super-infection). HDV is introduced through the same route as HBV. HDV infection is more likely to occur through injection drug use and or sexual contact with an infected person, and much less likely to be transmitted vertically, mother-to-child. The incubation period is approximately 2 to 8 weeks, similar to hepatitis B with a range of 45 to 160 days [average of 90 days]. HDV is usually identified by radioimmunassay or enzyme immunoassay for antibody to HDV (anti-HDV), however these antibodies may not be detectable until several weeks after the onset of clinical illness. Acute and convalescent sera may be required to confirm the diagnosis. Treatment is supportive in nature. Standard precautions are important to prevent transmission and the same control measures used to prevent and manage HBV is warranted. HDV can only infect someone when HBV is present. Isolated laboratory evidence of anti-HDV warrants further investigation for hepatitis B.

General Reporting Requirements

Missouri Statute, Chapter 19 of the Code of State Regulations (CSR) 20-20.20 the Reporting of Communicable Environmental and Occupational Diseases, identifies hepatitis B as a category II disease to be reported to the local health authority or to the Missouri Department of Health and Senior Services (DHSS) within 3 days of first knowledge or suspicion.

Instructions for Reporting:

1. For all cases, complete a Disease Case Report form (CD-1).
2. Complete the CDC Viral Hepatitis Case Report, if requested by the LPHA for confirmed (found at the end of this section):
    a. Acute hepatitis B
    b. Chronic hepatitis B cases and
    c. Perinatal cases -HBsAg-positivity in U.S. born infant aged less than 24 months. (See number 3 below for more instructions for a perinatal case.)
    d. HBsAg-positive pregnant women. (See number 3.)

3. If this is a prenatal (HBsAg-positive, HBeAg-positive, HBV-DNA positive, or anti-HBc IgM positive pregnant woman) or perinatal case, please indicate on the CD-1.
4. Enter vaccine history and/or vaccine administration, and/or HBIG administration information into the State Immunization Registry currently known as MOHSAIC (Missouri Health Strategic Architectures and Information Cooperative) as the vaccination information becomes known. Contact the DHSS Immunizations program regarding questions pertaining to MOHSAIC and vaccine administration or management at (573) 751-6124.
5. Missouri is a dual reporting state. Chapter 19 CSR 20-20.020 Report Communicable Environmental and Occupational Disease Rule states that physicians are to report. Chapter 19 CSR 20-20.080 Duties of Laboratories, states that laboratories are also to report. **Send all reports to: Hepatitis Quality Assurance Coordinator, P.O. Box 570, Jefferson City, MO 65102. These forms may also be faxed to (573) 751-6417.**
6. Chapter 19 CSR 20-20.70, Duties of Local Health Departments states, "All local health authorities shall forward reports of all diseases and conditions mentioned in 19 CSR 20-20.020 to the Missouri Department of Health. These reports shall be forwarded within twenty-four (24) hours after they are received, according to procedures established by Department of Health Director."
7. All **outbreaks** or "suspected" outbreaks must be reported as soon as possible to BHSH. This can be accomplished by completing the Missouri Outbreak Surveillance Report (CD-51). The contact number is (573) 526-5271 and the fax number is (573) 751-6417.

Responsibilities of the Local Public Health Agency (LPHA)

Reporting Requirements

It is important for the LPHA to promote disease case reporting according to Chapter 19 of the Code of State Regulations (CSR) 20-20.020. (See General Reporting Requirements)

1. For all confirmed acute, chronic, prenatal or perinatal cases, or a probable chronic case; complete a Disease Case Report form (CD-1), if not already completed by a physician.
2. Complete the CDC Viral Hepatitis Case Report for confirmed (found at the end of this section):
    a. Acute Hepatitis B
    b. Chronic Hepatitis B cases
    c. Perinatal cases - HBsAg-positivity in U.S. born infant aged less than 24 months

   d. HBsAg-positive pregnant women
3. Enter the information from the completed CDC Viral Hepatitis Case Report into the MOHSIS supplemental form section and the CD-1 information into MOHSIS in the appropriate fields.
4. If this is a prenatal (HBsAg-positive, HBeAg-positive, HBV-DNA positive, or anti-HBc, IgM positive pregnant woman) or perinatal case, contact Bureau of HIV/STD/Hepatitis (BHSH) and complete the:
   - **Prenatal Hepatitis B Case Report form (IMMP-29) and the**
   - **Perinatal Hepatitis B Case Report form (IMMP-29A)**
5. Staple the completed CDC Viral Hepatitis Case Report to the completed CD-1, and if applicable the IMMP-29 and IMMP-29A, and **mail to the Hepatitis Quality Assurance Coordinator, P.O. Box 570, Jefferson City, MO 65102. These forms may also be faxed to (573) 751-6417.**
6. Be prepared to answer hospitals questions about the Hepatitis B vaccine and/or HBIG availability for infants born to HBsAg-positive women. (Encourage birthing hospitals to enroll into the DHSS Vaccines for Children Program.)
7. Enter vaccine history and/or vaccine administration information along with HBIG into the State Immunization Registry currently known as MOHSAIC (Missouri Health Strategic Architectures and Information Cooperative) as the vaccination information becomes known. Contact DHSS The Bureau of Immunization Assessment and Assurance regarding questions pertaining to MOHSAIC and vaccine administration or management at (573) 751-6124.
8. Chapter 19 CSR 20-20.70, Duties of Local Health Departments states, "All local health authorities shall forward reports of all diseases and conditions mentioned in 19 CSR 20-20.020 to the Missouri Department of Health and Senior Services. These reports shall be forwarded within twenty-four (24) hours after they are received, according to procedures established by Department of Health Director." Entry of laboratory and/or disease case reports (CD-1) into MOHSIS negates the need to forward hardcopies result to DHSS.
9. All **outbreaks** or "suspected" outbreaks must be reported as soon as possible to BHSH. This can be accomplished by completing the Missouri Outbreak Surveillance Report (CD-51). The contact number is (573) 526-5271 and the fax number is (573) 751-6417.
10. Submit the final outbreak reports to BHSH within 90 days from the conclusion of an outbreak.

MOHSIS clarifications:

1. MOHSIS was designed to be a notification and surveillance database system for State and Local Health Departments to monitor communicable diseases for

epidemiological purposes. MOHSIS is not to be used as a patient medical management system.

2. A person can have only one condition for acute hepatitis B in a lifetime.
3. A person can have only one condition for chronic hepatitis B in a lifetime.
4. A person can have only one condition for perinatal hepatitis B in a lifetime.
5. The pregnancy status of all females of childbearing age 11 to 55 years must be determined and entered.
6. A female of childbearing age 11 to 55 years should have a new "Hepatitis B (Pregnancy) Prenatal" condition entered each time she is pregnant. A woman can have unlimited "Hepatitis B (Pregnancy) Prenatal" conditions.
7. When diagnostics are added for existing acute and/or chronic hepatitis B conditions, for a woman of childbearing years (11 to 55 years) a new "Hepatitis B (Pregnancy) Prenatal" condition will be added to MOHSIS with a "suspect" status until pregnancy status is determined.
8. If the female is pregnant, confirm the pregnancy status with "yes." Complete the IMMP-29 and IMMP-29A. The LPHA is to follow this case to ensure the infant completes the Hepatitis B vaccine series on schedule and completes the post-vaccination anti-HBs and HBsAg testing to determine the infant's immunity status and/or need for subsequent immunoprophylaxis. The LPHA is to follow household and sexual contacts to determine immunity status and any vaccination needs of these contacts. BHSH will be monitoring the LPHA's follow-up on these cases.
9. If the female is not pregnant, change the pregnancy status to a "no" and close the case as a "no case."

MOHSIS Entry and Disease Investigation

1. It is recommended that the LPHA check MOHSIS notifications for "acute" or "chronic" Hepatitis B entered into the LPHA jurisdiction daily. The following link http://dhssnet/ehcdp/Help13.pdf will give directions on how to run the notifications from MOHSIS.
2. It is recommended that the LPHA's run Crystal Reports daily to learn of any new laboratory results entered from the day before on existing "acute" or "chronic" Hepatitis B cases that are in the LPHA's jurisdiction. The following link http://dhssnet/ehcdp/Help31.pdf will give directions on how to use Crystal Reports Enterprise Web Reports.
3. Enter all information on any hepatitis B laboratory results and/or CD-1's received in your office into MOHSIS within 24 hours of receipt, including submitter and laboratory name.
4. Verify the clinical diagnosis and establish the extent of illness.
    a. Determine what laboratory tests were conducted.
    b. Determine the results.

c. Determine the clinical symptoms.
d. Determine whether the case is a suspect or confirmed acute hepatitis B case, a suspect or confirmed prenatal hepatitis B case, a confirmed perinatal case, or a suspect, probable or chronic hepatitis B case according to the lab work. **Patient contact is not recommended** until after the condition is confirmed by information from the laboratory results and the health care provider to avoid psychological trauma to a patient who may not be HBV infected. Only after sufficient information to confirm HBV infection is obtained, should the patient be contacted to complete a disease investigation.
e. Determine the vaccination status of the individuals and contacts.
f. Determine the source of the infection.
g. Determine the risk of infection to others, and contact those who may be at risk.

5. Initiate investigation of Acute Hepatitis B notifications. Contact the provider for additional information on suspect or confirmed cases (i.e. telephone calls). Only after an acute, chronic, prenatal, or perinatal condition is confirmed, is patient contact recommended to complete the investigation, and complete and enter into MOHSIS the required forms (i.e. CD-1 and Viral Hepatitis Case Report) within seven (7) days of the report date. It is important to document by date on the MOHSIS narrative any and all intervention provided, education provided, a client response, and you should also document unsuccessful attempts to locate.
6. Determine individual's gender and age. **All females between 11 to 55 years of age must have pregnancy status determined.** Begin this as soon as possible. If the female is not pregnant, close the case within 7 days as a prenatal "no case".
7. The investigation may follow any of the following three paths after obtaining enough information from the laboratory reports and the health care provider to determine infection status.
    a. If case is male, investigate and complete:
        i. Disease Case Report (CD-1).
        ii. CDC Viral Hepatitis Case Report (if case is confirmed).
        iii. Determine immunoprophylaxis/vaccination needs of household, sexual, and needle sharing contacts.
        iv. Non-pregnant contacts are to be encouraged to seek medical care for testing and immunization needs.
        v. Enter all identified contacts into MOHSIS.
    b. If case is female and not pregnant, investigate and complete:
        i. Disease case report (CD 1).
        ii. CDC Viral Hepatitis Case Report (if case is confirmed).
        iii. Determine immunoprophylaxis/vaccination needs of household, sexual, and needle sharing contacts.

iv. Contacts are to be encouraged to seek medical care for testing and immunization needs.
v. If the female is not pregnant, add a note in the Condition Narrative, indicating the pregnancy status was checked.
vi. Enter all identified contacts into MOHSIS.

c. If case is female and pregnant:
   i. Disease case report (CD-1).
   ii. CDC Viral Hepatitis Case Report (if confirmed as an acute case or a previously **un**reported chronic case)
      - Determine immunoprophylaxis/vaccination needs of household, sexual, and needle sharing contacts.
      - Contacts are to be encouraged to seek medical care for testing and immunization needs.
      - Enter all identified contacts into MOHSIS
   iii. Add a note in the Condition Narrative, indicating the pregnancy status was verified.
   iv. Add a note in the Condition Narrative with the female's Expected Date of Confinement (EDC), each time the woman is pregnant.
   v. Add a Hepatitis B (Pregnancy) Prenatal condition in MOHSIS.
   vi. Complete the IMMP-29 and IMMP-29A and fax (573-751-6417) or mail in confidential envelope to the Hepatitis Quality Assurance Coordinator, c/o BHSH, P.O. Box 570, Jefferson City, Missouri, 65102. BHSH will monitor the LPHA investigation and follow-up of these cases.
   vii. The LPHA shall follow all infants born to hepatitis B infected women to ensure appropriate and timely immunoprophylaxis, immunization, and post-vaccination serology (HBsAg and anti-HBS) testing to determine immunity status. These infants should complete the hepatitis B vaccine series according to the recommended schedule. Post-vaccination serology (HBsAg and anti-HBs) testing for infants born to HBV infected women should be conducted 1 to 2 months after the third dose of appropriately administered Hepatitis B vaccine, but not to be completed before the infant is 9 months of age. This is to avoid detection of anti-HBs from HBIG administered during infancy and to maximize the likelihood of detecting late HBV infection. Infants may complete their Hepatitis B vaccination series with combination vaccine, and complete the post-vaccination HBsAg and anti-HBs testing after the third dose as long (as the infant is at least 9 months of age.) BHSH will be available for consultation and technical assistance to the LPHA's as the investigation and follow-up of these cases progress. DHSS is required to evaluate and report aggregate

immunoprophylaxis efforts and outcomes to the CDC National Perinatal Hepatitis B Prevention Program.

viii. Enter all identified contacts into MOHSIS.

8. Establish a tracking and reminder-recall method to ensure timely immunoprophylaxis and post-vaccination serology testing for the infants born to hepatitis B infected women, and their sexual and household contacts.
9. Investigation of case contacts will be ongoing. Once the immunization needs of these contacts are identified and the interventions completed, the contacts cases can be closed.
10. Enter vaccine history or vaccine administration into the State Immunization Registry (MOHSAIC) as the information becomes known.
11. Determine immunoprophylaxis/vaccination needs of the household and sexual contacts, and help arrange to get them or provide them.
12. Notify the DHSS Hepatitis Quality Assurance Coordinator with vaccine administration updates within 7 days of receipt of new information by either of the following two ways:
    a. Data entry of immunization information into the State Immunization Registry
    b. Submission of an updated IMMP-29 or IMMP-29A form
13. Provide education and counseling regarding chronic infection and need for follow up and monitoring with a gastroenterologist or hepatologist to monitor progression of the disease and medical management.
14. If the case is in prison, close all new hepatitis B conditions with "no investigation needed." The Missouri Department of Corrections (MDOC) is responsible for the investigation.
15. When there are issues concerning MOHSIS such as: if the system is down, running too slow and/or locks up, please contact the Help Desk. The toll free number is (800) 347-0887 or local at (573) 751-6388, email at support@dhss.mo.gov. This information will ensure that all MOHSIS users will have access to the system.

LPHA's may create customized HBV surveillance reports that are available online through Crystal Reports. LPHA staff may also run reports to monitor jurisdictional HBV prevalence and MOHSIS disease notifications. Contact BHSH for information on how to run reports online.

Required Notifications For Suspected HBV Outbreaks:

1. Upon learning of a suspected outbreak of hepatitis B, **immediately** contact BHSH (573-526-5271), or the Department of Health and Senior Services' Situation Room (DSR) at 800-392-0272 (24/7).
2. Contact the Bureau of Child Care (573-751-2450) if cases are associated with a childcare facility.

3. Contact the Section for Long-Term Care Regulation (573-526-8524) if cases are associated with a long-term care facility.
4. Contact the Bureau of Health Services Regulation (573-751-6303) if cases are associated with a hospital or hospital-based long-term care facility.

Case Definitions

Hepatitis B, Acute
Case Definition
Clinical criteria
An acute illness with:

1. discrete onset of symptoms (e.g. fatigue, abdominal pain, loss of appetite, intermittent nausea, vomiting), and
2. jaundice or elevated serum aminotransferase levels* (ALT and AST).

Laboratory criteria for diagnosis

1. IgM antibody to hepatitis B core antigen (anti-HBc) positive or Hepatitis B surface antigen (HBsAg) positive
2. IgM anti-HAV negative (if done)

Clinical description
Cases in these categories may or may not have an acute onset of illness or symptoms and may or may not have elevated liver enzyme test results. Additional information is required to correctly classify the case.

Case classification
Suspect: IgM anti-HBc without symptoms, or history is currently unavailable and the case has not been reported previously. This case should remain open until information is available to reclassify the case.

* A case with an IgM HBc antibody negative with an HBsAg positive may represent a very early infection. Enter as an acute suspect until further investigation is complete to determine whether the case can be confirmed as an acute or chronic condition.

Confirmed: A case that meets the clinical case definition and is laboratory confirmed.

Comments: Recommend medical monitoring of illness by primary care provider.

*Elevated ALT is generally considered > 1.5-2 x upper limit of normal according to the reference range provided on the laboratory report.

Hepatitis B, Chronic:
Case Definition
Clinical description:

Persons with chronic hepatitis B virus (HBV) infection may have no symptoms. They may have no evidence of liver disease, or they may have a spectrum of disease ranging from chronic hepatitis to cirrhosis or liver cancer.

Laboratory criteria for diagnosis

1. IgM anti-HBc negative, **and**
2. A positive result on one of the following tests:
    a. hepatitis B surface antigen (HBsAg)
    b. hepatitis B e antigen (HBeAg) or
    c. hepatitis B virus HBV- DNA

OR

3. Any combination of these positive tests performed 6 months apart:
    a. HBsAg-positive; **or**
    b. HBV-DNA-positive; **or**
    c. HBeAg-positive

Case classification
***Confirmed*:** A case that meets either laboratory criteria for diagnosis.

Probable: a case with a single HBsAg-positive, or HBV-DNA-positive or HBeAg-positive laboratory result when no IgM-anti-HBc results are available.

Suspect: A single HBV-DNA *quantitative test with a result of "less than the lower detection limit of the assay",* **or** a single anti-HBc Total-positive, **or** an anti-HBe-positive will need further investigation. *(Seroconversion from HBeAg to anti-HBe usually indicates loss of infectivity; a positive anti-HBe can also represent a chronic carrier, as a positive anti-HBe does not rule out chronic hepatitis B and or infectivity. It is impossible to know which state these tests represent without other laboratory results or clinical information).*

Comments: Multiple laboratory tests indicative of chronic HBV infection may be performed simultaneously on the same patient specimen as part of a "hepatitis panel". Testing performed in this manner may lead to seemingly discordant results, e.g. HBsAg-negative and HBV-DNA positive. For the purposes of this case definition, any positive result among the three laboratory tests mentioned above is acceptable, regardless of other testing results. Negative HBeAg results and HBV-DNA levels below the positive cutoff level do not confirm the absence of HBV infection.

Routine medical monitoring and management by a specialist in gastroenterology or

hepatology is recommended for anyone with chronic HBV infection.
HBsAg-positive test results by enzyme immunoassay (EIA) should be confirmed by an additional more specific neutralization assay. Most laboratories include the neutralization assay as a part of their testing protocol. This may or may not be documented on the laboratory result. If confirmation is not documented on the lab report, contact the submitting laboratory to determine whether confirmation testing was done prior to reporting the test as positive. It should be noted that in rare circumstances some laboratories might report a preliminary HBsAg-positive without the confirmation (neutralization) assay.

When a report (either a CD-1 or verbal statement from the physician that the patient is chronic) is received for a chronic hepatitis B case without supporting diagnostic laboratory tests, the case is to be entered into MOHSIS as hepatitis B Chronic with a condition status as "suspect". The case status may be updated to the appropriate status when supporting laboratory tests are received.

When DHSS receives an isolated HBV-DNA quantitative test with a result of "less than the lower detection limit of the assay", the case will be entered into MOHSIS as a hepatitis B chronic with a condition status of "suspect". The LPHA may change the case status when supporting information or laboratory tests are received. The LPHA is encouraged to contact the health care provider to find out whether or not there are additional hepatitis B tests or clinical information to substantiate or reject a confirmed condition status. The health care provider should be able to provide information to determine either:

a. The case is not considered a case of HBV based on subsequent screening, clinical, or laboratory evaluation.
b. The patient is a chronic hepatitis B case being monitored for treatment purposes.

Without further information, the significance of the test result is unknown. Answers to these questions will help the LPHA to determine the appropriate case disposition and whether any further follow-up is warranted. In this case, request a copy of the confirmatory laboratory test results. When the copies are received, enter them into MOHSIS, update the condition status, diagnostics, and case disposition as appropriate.

Contact with the patient is NOT recommended unless the LPHA determines the additional information from the provider supports the need for a full disease investigation for a confirmed, unreported hepatitis B case in need of contact identification, disease and transmission counseling, medical referral, or a prenatal case to be followed in case management.

The lower limit of detection of the Hepatitis B Viral DNA Assay (HBV-DNA) Quantitative, serum, is usually 357 IU/mL, however there may be individual test differences. Specimen results "below the detectable limits of the assay" (<357 IU/mL)

do not always indicate the absence of HBV infection. Physicians generally use this test to determine candidacy for treatment or for monitoring a patient's response to treatment. Serological markers (such as HBsAg) are routinely used as diagnostic indicators of acute and chronic HBV infection.

Hepatitis B, Prenatal:
Case Definition
Clinical description
A pregnant female who is HBsAg-positive, who may or may not have symptoms, and may have previously been identified as an acute or chronic case of Hepatitis B.

Laboratory criteria for diagnosis
A positive result on one of the following tests:
hepatitis B surface antigen (HBsAg)
hepatitis B e antigen (HBeAg) or
hepatitis B virus HBV- DNA
hepatitis B anti-HBc IgM

Case classification:
Confirmed: A pregnant female who is HBsAg-positive
(Positive HBeAg, HBV-DNA, or IgM anti-HBc test represents current infectivity, therefore an HBsAg tests should be completed on all pregnant women).

Comment: Pregnant women **should** have an HBsAg status regardless of other HBV tests on file. Infants born to HBsAg-positive, HBeAg-positive, and HBV-DNA-positive mothers will need case management to ensure appropriate immunoprophylaxis with HBIG and timely hepatitis B vaccination, and post-vaccination serology testing (HBsAg, and anti-HBs) to determine immunity status after the third dose when the infant is nine months of age or older. Household contacts or sexual contacts will need to be evaluated for immunity or immunization. Pregnant women who have an isolated IgM antiHBc-positive during their pregnancy should be tested for HBsAg prior to or at the time of delivery to determine whether the infant will need HBIG at birth.

Hepatitis B, Perinatal:
Case Definition
Clinical description
Perinatal hepatitis B in the newborn may range from no symptoms to fulminant hepatitis.

Laboratory criteria for diagnosis
Hepatitis B surface antigen (HBsAg) positive

Case classification:
Confirmed: HBsAg-positivity in any infant 24 months of age or younger born in the United States or in U.S. territories to an HBsAg-positive woman.

Comments: Medically stable infants born to HBsAg-positive mothers should receive hepatitis B immune globulin (HBIG) and the first dose of hepatitis B vaccine within 12 hours of birth, followed by the second and third doses of vaccine at 1 and 6 months of age, respectively. Post-vaccination testing for HBsAg and anti-HBs (antibody to HBsAg) is recommended from 3 to 6 months following completion of the vaccine series. Post-vaccination testing for HBsAg may determine if the infant is already infected. Infants infected with HBV virus should be referred to a gastroenterologist or hepatologist for long term medical monitoring and management.

Case Definitions Reference Table		
Hepatitis B Disease	Suspect/Probable	Confirmed
Acute Hepatitis B	***Suspect*** Isolated IgM anti-HBc-positive with unknown symptom history and not a previously known case A case with an IgM & HBsAg-positive result could be a very early case. Further investigation is needed to determine Actue or Chronic condition.	***Confirmed*** HBsAg-positive **Or** IgM anti-HBc-positive **And** discrete onset of symptoms and jaundice or elevated ALT/AST **And** IgM Anti-HAV-negative (if done)
Chronic Hepatitis B	***Suspect*** Single HBV-DNA quantitative test with a result of "less than the lower detection limit of the assay" **Or** A single anti-HBc Total-positive Either test without other laboratory results or clinical information warrants further information from the health care provider. ***Probable:*** a case with a single HBsAg-positive, HBV-DNA-posititve or HBeAg-positive lab result when no IgM anti-HBc results are available	***Confirmed*** IgM anti-HBc -negative **and** a positive result on one of the following tests: 1. HBsAg-positive, 2. HBeAg -positive, 3. HBV-DNA-positive **Or** Any combination of positivity **two times at least 6 months apart** in the following tests: 1. HBsAg-positive 2. HBeAg-positive 3. HBV-DNA-positive
Perinatal Hepatitis B (Infant)	***Suspect*** HBV-DNA-positivity in an infant ≤ 24 months of age born in the U.S. or U.S. territories Further investigation needed.	***Confirmed*** HBsAg-positive infant ≤ 24 months old, born in the U.S. or U.S. territories to HBsAg-positive mother
Prenatal Hepatitis B (pregnancy)	***Suspect*** Single IgM anti-HBc- positive **and** pregnant Further investigation is needed.	***Confirmed*** HBsAg-positive, or HBeAg-positive, or HBV-DNA-positive **and** pregnant (HBsAg testing is required on all pregnant women under Missouri Law

Interpretation of Hepatitis B Laboratory Tests

Interpretation of Several Combinations of Hepatitis B Serologic Tests:

Tests for HBV				Interpretation
HBsAg	Anti-HBs	Anti-HBc,	Anti-HBc IgM	
+	–	–	–	Very recent, acute HBV infection (infectious)
+	–	+	+	Acute HBV infection (infectious)
+	–	+	–	Chronic HBV infection with HBsAg carriage (infectious)
–	–	+	+	Acute HBV infection, anti-HBs has not yet appeared (may be infectious)
–	+	+	+	Resolving acute HBV infection (may be infectious)
–	+	+	–	HBV infection in the remote past (Immune)
–	–	+	–	HBV infection in the remote past (Immune)
–	–	–	Not Tested	No hepatitis B infection, if liver abnormalities exist they are due to another virus, toxin or condition
–	+	–	Not Tested	Post hepatitis B vaccine or post HBIG

Interpretation of the Hepatitis B Panel:

Tests	Results	Interpretation	Vaccinate?
HBsAg Anti-HBc Anti-HBs	Negative Negative Negative	Susceptible	vaccinate if indicated
HBsAg Anti-HBc Anti-HBs	Negative Positive Positive	Immune due to natural infection	no vaccination necessary
HBsAg Anti-HBc Anti-HBs	Negative Negative Positive	Immune due to hepatitis B vaccination	no vaccination necessary
HBsAg Anti-HBc IgM anti-HBc Anti-HBs	Positive Positive Positive Negative	Acutely infected	no vaccination necessary
HBsAg Anti-HBc IgM anti-HBc Anti-HBs	Positive Positive Negative Negative	Chronically infected	no vaccination necessary (may need treatment)
HBsAg Anti-HBc Anti-HBs	Negative Positive Negative	Four interpretations possible*	use clinical judgment

*Possible interpretations:

1. May be recovering from acute HBV infection.
2. May be distantly immunized and test not sensitive enough to detect very low level of anti-HBS in serum.
3. May be susceptible with a false positive anti-HBc.
4. May be undetectable level of HBsAg present in the serum and the person is actually a carrier.

Post-vaccination testing, when it is recommended, should be performed one (1) to two (2) months after the last dose of vaccine. Infants born to HBsAg-positive mothers should be tested one (1) to two (2) months after completion of the hepatitis B series.

Caution: Serological testing (HBsAg and anti-HBS) should not be completed before the infant is at least 9 months of age to avoid detection of anti-HBs from HBIG administered during infancy and to maximize the likelihood of detecting late HBV infection.

- It is acceptable to perform HBsAg post vaccination testing on infants born to HBsAg-positive women following the third dose of a four-dose schedule to check

for infections. If the HBsAg on the infant is positive, the infant should be considered infected and the fourth dose would not be beneficial.

- It is acceptable to perform HBsAg and Anti-HBs post-vaccination testing together for infants born to HBsAg positive women, if the HBsAg test was missed after the third dose of a four-dose schedule.

Responsibilities of the Bureau of HIV, STD and Hepatitis

1. Provide consultation for HBV disease investigation and perinatal hepatitis B case follow-up.
2. Enter laboratory and CD-1 information into MOHSIS, within 24 hours, if first received by BHSH.
3. Add a Hepatitis B (Pregnancy) condition with a condition status as "suspect" into MOHSIS each time a new positive hepatitis B laboratory result is received on previously or newly reported cases, unless DHSS case management and/or data entry staff determine pregnancy status on this case prior to entry into MOHSIS. When this is the case, it will be entered as appropriate.
4. Conduct Quality Assurance reviews to ensure the cases meet current CDC case definitions and accurate data entry.
5. Monitoring statewide HBV prevalence and perinatal prevention activities.
6. Provide educational materials and presentations.

State Public Health Laboratory Procedures

1. State Public Health Lab (SPHL) will only conduct the following hepatitis B tests free of charge to Missouri providers:
   a) Hepatitis B screening and confirmatory tests for newly arriving refugees (children and adults) to determine infection status and/or immunization needs.
   b) Hepatitis B screening and confirmatory tests for children vaccinated in foreign countries with vaccine of unknown efficacy to determine infection status and/or immunization needs.
   c) HBsAg tests for pregnant women with no other means of paying for them to determine risk of infection to the infant and immunoprophylaxis needs at birth.
   d) Anti-HBc (total core) tests for household and sexual contacts of HBsAg-positive pregnant women (children and adults) to determine infection status and/or immunization needs.
   e) Anti-HBs and HBsAg post-vaccination testing for sexual and household contacts of HBsAg-positive pregnant women (children and adults), if indicated; and Anti-HBs and HBsAg post-vaccination infant serology testing for infant born to HBsAg-positive women. (This testing may be necessary when subsequent

immunization management depends on knowing the immune status because of continued exposure risk. The test must be completed one (1) to two (2) months after completion of the vaccine series to determine vaccine-induced immunity). **Infants born to HBsAg-positive women. Post-vaccination HBsAg and anti-HBs testing is needed 1-2 months after completion of the vaccination series on these infants.**

f) Post-exposure testing for Local Public Health Agency (LPHA) workers following a needle stick injury or occupational exposure.

2. DHSS will consider a specific instance where a Hepatitis test may be requested that does not fall into the categories listed above. This will be done on a case-by-case basis.
3. The SPHL does NOT perform Delta hepatitis testing. If Delta hepatitis is suspected, recommend that the physician submit the specimen to a commercial laboratory for testing. If a commercial laboratory is not an option, contact BHSH and staff will coordinate sending the specimen to Centers for Disease Control and Prevention (CDC).
4. Draw one red-top tube of blood, using standard precautions (whole blood).
5. Either send serum OR whole blood.

   To send serum:

   i. Allow blood to stand for 30 minutes to 1 hour.
   ii. Centrifuge at 2000 rpm for 5 minutes.
   iii. Pour clear serum into another red top tube*
   iv. Discard clot tube safely.

   There are no specific requirements when sending whole blood.

   NOTE: Hot or cold weather conditions can hemolyze whole blood, making it unsuitable for testing. Specimens should be sent as serum under these conditions.
6. Wipe off outside of tube with alcohol.
7. Label tube carefully; include patient's name and date sample obtained. Samples without this information on both the tube and request form *will not be tested and will be discarded.*
8. Fill out lab form "Hepatitis Test Request", as completely as you can. If you are screening contacts mark the box labeled "Hepatitis B-EIA for (HBsAg)".
9. Immediately mail blood or serum including the form.
10. If the test is requested by a local public health agency (LPHA), state the name of the LPHA on the lab form. If submitted by a private physician, he/she will be charged.

*The state lab cannot provide multiple red top tubes

Control Measures

For specific control measures consult the current reference manuals listed below:

American Academy of Pediatrics. "Hepatitis B." In: Pickerton, LK. ed. Red Book 2*006: Report of the Committee on Infectious Diseases*. 27th ed. Elk Grove Village, IL. American Academy of Pediatrics; 2006: 335-355.

Heymann, D., MD, ed. "Hepatitis B." *Control of Communicable Diseases Manual* (CCDM), 18th ed. Washington, D.C.: American Public Health Association, 2004: 253-261.

Links

CDC Viral Hepatitis B Information:
http://www.cdc.gov/ncidod/diseases/hepatitis/b/index.htm

American Liver Foundation:
http://www.liverfoundation.org/

CDC National Immunization Program information for Health Care Providers:
http://www.cdc.gov/nip/home-hcp.htm

References

1. ACIP, et all, *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, December 23, 2005 Volume 54/RR-16.
2. American Academy of Pediatrics. "Hepatitis B." In: Pickering, LK, ed. *Red Book: 2003 Report of the Committee on Infectious Diseases.* 26th ed. Elk Grove Village, IL. 2003: 318-336.
3. Atkinson, W., et al. Eds. *Epidemiology and Prevention of Vaccine-Preventable Diseases; 7th Ed.*: Atlanta: National Immunization Program, Centers for Disease control and Prevention, 2002:169-189.
4. Centers for Disease Control and Prevention. *Case Definitions for Infectious Conditions Under Public Health Surveillance*. MMWR 1997:46 (No.RR-10): 18-19.
5. Centers for Disease Control and Prevention. *Epidemiology and Prevention of Vaccine-Preventable Diseases.* 9th ed. 2006.

6. Evans, A., & Kaslow, R. Eds. *Viral Infections of Humans Epidemiology and Control;*. 4th Ed. New York: Plenum, 1997: 375-387
7. Heymann, D. Ed. *Control of Communicable Diseases Manual "Hepatitis B and Delta Hepatitis."* 18th ed. Washington, D.C. American Public Health Association, 2004: 253-261, 264-266.
8. Hoeprich P., Jordan M., & Ronald A. *Infectious Diseases, A Treatise of Infectious Processses,* 5th Ed.: J.B. Lippincott Company, Philadelphia, 1994: pgs 806-807.
9. Mandell, G., Bennett, J., Dolin, R. *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases.* "Hepatitis B." 2005: 6th Ed.
10. Mayo Medical Laboratories. *Interpretive Handbook.* 2005.

MOHSIS Entry Guidance for Hepatitis B Conditions

Hepatitis B conditions:
A person can have:
- **Only 1 acute condition**
- **Only 1 Chronic condition**
- **Multiple (pregnancy) Prenatal**
- **Only 1 perinatal condition**

Received HBsAg-positive laboratory report

Search MOHSIS by party name and date of birth

Party found in MOHSIS. Review /determine any previous hepatitis conditions entered.

Party not found. Add party. Determine and add what hepatitis conditions need to be entered.

Acute condition exists. If only hepatitis B acute or hepatitis B infant has been entered and it has been more than six months, enter a "hepatitis B chronic" condition with the laboratory information and assign jurisdiction to current address.

Chronic condition exists.

Add laboratory information to the existing condition.

Add any new locator information to the Party. (The jurisdiction will not change on existing

If person is male, MOHSIS entry is now complete.

If person is female, pregnancy status must be determined and entered.
If she is between the ages of 11-55, determine the pregnancy status. If she is pregnant, enter a new Hepatitis B (Pregnancy) Condition with a Confirmed status into MOHSIS. If she is not pregnant enter a note into the Condition narrative indicating she is not pregnant.

Does acute condition exist?
Does case meet the CDC hepatitis B acute definition?
Does case meet the CDC hepatitis B (infant) definition?
Continue case investigation and enter additional info as collected.

Does chronic condition exists?
Does case meet the CDC hepatitis B chronic condition definition?
(HBsAg-positivity for greater than 6 months.
(Stop MOHSIS entry if party is male.)

Pregnancy Condition
If female between the ages of 11-55, determine the pregnancy status. If she is pregnant, enter a new Hepatitis B (Pregnancy) Condition with a Confirmed status into MOHSIS and change the pregnancy question to "yes". If she is not pregnant change the pregnancy question to "no" and enter a note into the condition narrative.

MISSOURI DEPARTMENT OF HEALTH AND SENIOR SERVICES
SECTION FOR COMMUNICABLE DISEASE PREVENTION
PERINATAL HEPATITIS B PREVENTION AND
CASE MANAGEMENT PROGRAM

PERINATAL HEPATITIS B CASE MANAGEMENT FORM FOR HBSAG-POSITIVE PREGNANT OR NEWLY POSTPARTUM WOMEN

DATE OF REPORT (TO BE FILLED OUT BY SUBMITTER)	PREGNANCY STATUS (CHECK ONE) ☐ PRENATAL ☐ POSTNATAL

DEMOGRAPHICS FOR HBSAG-POSITIVE PREGNANT OR NEWLY POSTPARTUM WOMEN

NAME				DATE OF BIRTH	COUNTY
ADDRESS				CITY	
STATE	ZIP CODE	COUNTY	WORK TELEPHONE NUMBER	HOME TELEPHONE NUMBER	
COUNTRY OF BIRTH	RACE (CHECK ONE) ☐ NATIVE AMER/ALASKAN NATIVE ☐ ASIAN/PACIFIC ISLANDER ☐ AFRICAN AMERICAN ☐ WHITE ☐ OTHER ☐ UNKNOWN		ETHNICITY (CHECK ONE) ☐ HISPANIC ☐ NON HISPANIC ☐ UNKNOWN	LANGUAGE (WRITE IN)	

CLINICAL INFORMATION

EXPECTED DELIVERY HOSPITAL NAME	EXPECTED DELIVERY DATE	ACTUAL DELIVERY DATE	WAS THIS THE ACTUAL DELIVERY HOSPITAL? ☐ YES ☐ NO IF NO, WRITE IN NAME OF ACTUAL HOSPITAL BELOW	
ADDRESS			HOSPITAL	
PHYSICIAN'S NAME	PROVIDER'S TELEPHONE NUMBER		CLINIC NAME	
ADDRESS	PROVIDER TYPE (CHECK ONE) ☐ PRIVATE ☐ PUBLIC		DID SHE RECEIVE PRENATAL CARE? (CHECK ONE) ☐ YES ☐ NO	
CITY			STATE	ZIP CODE

HEPATITIS B LABORATORY RESULTS

DATE					
DATE	HBsAg (EARLY MARKER OF INFECTIVITITY)*	POSITIVE/ REACTIVE ☐	NEGATIVE/ NONREACTIVE ☐	NOT DONE ☐	IF POSITIVE OR REACTIVE – CAPABLE OF TRANSMITTING VIRUS TO OTHERS ***SPHL WILL CONDUCT HBsAg TESTING FREE FOR PREGNANT WOMEN WITHOUT MEANS OF PAYMENT**
DATE	Anti-HBc IgM (BEST MARKER OF ACUTE HBV INFECTION)	POSITIVE/ REACTIVE ☐	NEGATIVE/ NONREACTIVE ☐	NOT DONE ☐	IF POSITIVE INDICATES RECENT HBV INFECTION. BEST SEROLOGIC MARKER OF ACUTE INFECTION. NEGATIVE WITH A POSITIVE HBsAg, USUALLY MEANS CHRONIC INFECTION.
DATE	ANTI-HBC (TOTAL) (NOT A MARKER FOR ACUTE INFECTION)	POSITIVE/ REACTIVE ☐	NEGATIVE/ NONREACTIVE ☐	NOT DONE ☐	IF POSITIVE INDICATES HBV INFECTION AT SOME UNDEFINED TIME – PAST OR PRESENT. IS NOT POSITIVE IN PERSON WHOSE IMMUNITY IS FROM VACCINATION.
DATE	OTHER (WRITE IN)	POSITIVE/ REACTIVE ☐	NEGATIVE/ NONREACTIVE ☐	NOT DONE ☐	WRITE IN

COMPLETED BY

NAME	HEALTH CARE AGENCY NAME		
ADDRESS		TELEPHONE NUMBER	
CITY	STATE	ZIP CODE	COUNTY

PLEASE SUBMIT COMPLETE FORM TO THE MISSOURI DEPARTMENT OF HEALTH AND SENIOR SERVICES REGIONAL OFFICE OR TO P.O. BOX 570, JEFFERSON CITY, MO 65102-0570. TELEPHONE: 573-751-6113 OR FAX 573-526-0235.

FOR DHSS USE ONLY

DATE RECEIVED DHSS	REGION (CHECK ONE) ☐ NW ☐ CE ☐ ES ☐ SW ☐ SE ☐ ST L CO ☐ ST L CITY ☐ KC	DATE ENTERED INTO ARTEMIS	ARTEMIS CASE NUMBER	DATE ENTERED INTO MOHSIS

INFANT BORN TO HBSAG-POSITIVE WOMAN

INFANT'S MEDICAL RECORD OR DCN NUMBER	INFANT'S DATE OF BIRTH

INFANT'S DEMOGRAPHICS

INFANT'S NAME (LAST, FIRST, MI)	SEX (CHECK ONE) ☐ MALE ☐ FEMALE

MOTHER'S NAME (LAST, FIRST, MI) IF THE INFANT DOES NOT LIVE WITH OR MOTHER IS NOT THE LEGAL GUARDIAN/RESPONSIBLE PARTY, WRITE IN NAME OF WHO IS.

IS INFANT'S ADDRESS THE SAME AS MOTHER'S? (CHECK ONE) ☐ YES ☐ NO	IF NO, WRITE IN INFANT'S ADDRESS

CITY	STATE	ZIP CODE	RESPONSIBLE PARTY'S TELEPHONE NUMBER

INFANT'S CHEMOPROPHYLAXIS/VACCINATIONS RECORD

DATE	PRODUCT	MANUFACTURER AND LOT NUMBER	PROVIDER NAME AND ADDRESS	TELEPHONE NUMBER
	HBIG			
	HEP B VACCINE DOSE #1			
	HEP B VACCINE DOSE #2			
	HEP B VACCINE DOSE #3			
	HEP B VACCINE **DOSE OTHER**			

GUIDELINES

CONSULT MOST RECENT EDITION OF THE PINK BOOK AT HTTP://www.cdc.gov/nip/publiations/pink/default.htm

FOLLOW-UP SEROLOGY (3-9 MONTHS AFTER FINAL DOSE OF HEPATITIS B VACCINE. USUALLY AT 9-15 MONTHS OF AGE)

DATE					
DATE	Anti-HBs*	☐ POSITIVE/REACTIVE ≥ 10M IU/mL	☐ NEGATIVE/NON-REACTIVE	☐ UNKNOWN	☐ NOT DONE
DATE	HBsAg	☐ POSITIVE/REACTIVE	☐ NEGATIVE/NON-REACTIVE	☐ UNKNOWN	☐ NOT DONE
DATE	Anti-HBc (TOTAL)	☐ POSITIVE/REACTIVE	☐ NEGATIVE/NON-REACTIVE	☐ UNKNOWN	☐ NOT DONE
DATE	Anti-HBc IgM	☐ POSITIVE/REACTIVE	☐ NEGATIVE/NON-REACTIVE	☐ UNKNOWN	☐ NOT DONE

TESTS	RESULTS	INTERPRETATION
HBsAg Anti-HBc Anti-HBs	NEGATIVE NEGATIVE NEGATIVE	SUSCEPTIBLE TO HBV
HBsAg Anti-HBc Anti-HBs	NEGATIVE NEGATIVE POSITIVE WITH ≥ 10 mIU/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	THERE ARE INTERPRETATIONS POSSIBLE - SEE PINK BOOK

NOTES (USE ADDITIONAL NOTES PAGE AS NEEDED

CASE DISPOSITION: DATE AND REASON (EXPECTED REASON-COMPLETION OF SEROLOGY TESTING AND EVIDENCE OF IMMUNITY)

MISSOURI DEPARTMENT OF HEALTH AND SENIOR SERVICES
SECTION FOR COMMUNICABLE DISEASE PREVENTION
PERINATAL HEPATITIS B PREVENTION AND
CASE MANAGEMENT PROGRAM

CASE CONTACT REPORT FOR CONTACTS OF PREGNANT HBSAG - POSITIVE WOMEN

DATE OF REPORT (TO BE FILLED OUT BY SUBMITTER)	ORIGINAL PREGNANT FEMALE NAME

CONTACT #1 AND HOUSEHOLD CASE DEMOGRAPHIC

NUMBER OF ADULTS IN HOUSEHOLD	NUMBER OF CHILDREN IN HOUSEHOLD	DATE OF BIRTH	RELATIONSHIP TO ORIGINAL CASE
NAME			
ADDRESS		CITY	
STATE / ZIP CODE	COUNTY / WORK TELEPHONE NUMBER	HOME TELEPHONE NUMBER	
COUNTRY OF BIRTH	RACE (CHECK ONE): ☐ NATIVE AMER/ALASKAN NATIVE ☐ ASIAN/PACIFIC ISLANDER ☐ AFRICAN AMERICAN ☐ WHITE ☐ OTHER ☐ UNKNOWN — ETHNICITY (CHECK ONE): ☐ HISPANIC ☐ NON HISPANIC ☐ UNKNOWN	LANGUAGE (WRITE IN)	GENDER ☐ M ☐ F

TEST RESULTS

DATE				
DATE	HBsAg	☐ POSITIVE/REACTIVE	☐ NEGATIVE/NON-REACTIVE	☐ NOT DONE
DATE	AntiHBc IgM	☐ POSITIVE/REACTIVE	☐ NEGATIVE/NON-REACTIVE	☐ NOT DONE
DATE	Anti-HBc (total)	☐ POSITIVE/REACTIVE	☐ NEGATIVE/NON-REACTIVE	☐ NOT DONE
DATE	Anti-HBs	☐ POSITIVE/REACTIVE ≥ 10 IU/mL	☐ NEGATIVE/NON-REACTIVE	☐ NOT DONE

PROPHYLAXIS

	PROVIDER
DATE — HBIG	
DATE — HB Dose #1 Hep B Vac	
DATE — HB Dose #2 Hep B Vac	
DATE — HB Dose #3 Hep B Vac	
DATE — HB Dose #4 Hep B Vac (if needed, see Pink Book)	

FOR DHSS USE ONLY

CASE RESOLUTION DATE	REASON	DATE RECEIVED BY DHSS	DATE ENTERED INTO ARTEMIS	DATE ENTERED INTO MOHSIS
	☐ IMMUNITY DUE TO VACCINATION ☐ IMMUNITY DUE TO NATURAL INFECTION ☐ CHRONIC INFECTION			

CONTACT #2 AND HOUSEHOLD CASE DEMOGRAPHIC

NUMBER OF ADULTS IN HOUSEHOLD	NUMBER OF CHILDREN IN HOUSEHOLD	DATE OF BIRTH	RELATIONSHIP TO ORIGINAL CASE
NAME			
ADDRESS		CITY	
STATE / ZIP CODE	COUNTY / WORK TELEPHONE NUMBER	HOME TELEPHONE NUMBER	
COUNTRY OF BIRTH	RACE (CHECK ONE): ☐ NATIVE AMER/ALASKAN NATIVE ☐ ASIAN/PACIFIC ISLANDER ☐ AFRICAN AMERICAN ☐ WHITE ☐ OTHER ☐ UNKNOWN — ETHNICITY (CHECK ONE): ☐ HISPANIC ☐ NON HISPANIC ☐ UNKNOWN	LANGUAGE (WRITE IN)	GENDER ☐ M ☐ F

TEST RESULTS

DATE				
DATE	HBsAg	☐ POSITIVE/REACTIVE	☐ NEGATIVE/NON-REACTIVE	☐ NOT DONE
DATE	AntiHBc IgM	☐ POSITIVE/REACTIVE	☐ NEGATIVE/NON-REACTIVE	☐ NOT DONE
DATE	Anti-HBc (total)	☐ POSITIVE/REACTIVE	☐ NEGATIVE/NON-REACTIVE	☐ NOT DONE
DATE	Anti-HBs	☐ POSITIVE/REACTIVE ≥ 10 IU/mL	☐ NEGATIVE/NON-REACTIVE	☐ NOT DONE

PROPHYLAXIS		PROVIDER
DATE	HBIG	
DATE	HB Dose #1 Hep B Vac	
DATE	HB Dose #2 Hep B Vac	
DATE	HB Dose #3 Hep B Vac	
DATE	HB Dose #4 Hep B Vac (if needed, see Pink Book)	

FOR DHSS USE ONLY

CASE RESOLUTION DATE	REASON	DATE RECEIVED BY DHSS	DATE ENTERED INTO ARTEMIS	DATE ENTERED INTO MOHSIS
	☐ IMMUNITY DUE TO VACCINATION ☐ IMMUNITY DUE TO NATURAL INFECTION ☐ CHRONIC INFECTION			

CONTACT #3 AND HOUSEHOLD CASE DEMOGRAPHIC

NUMBER OF ADULTS IN HOUSEHOLD	NUMBER OF CHILDREN IN HOUSEHOLD	DATE OF BIRTH	RELATIONSHIP TO ORIGINAL CASE
NAME			
ADDRESS		CITY	
STATE / ZIP CODE	COUNTY / WORK TELEPHONE NUMBER	HOME TELEPHONE NUMBER	

COUNTRY OF BIRTH	RACE (CHECK ONE)		ETHNICITY (CHECK ONE)	LANGUAGE (WRITE IN)	GENDER
	☐ NATIVE AMER/ALASKAN NATIVE	☐ WHITE	☐ HISPANIC		☐ M ☐ F
	☐ ASIAN/PACIFIC ISLANDER	☐ OTHER	☐ NON HISPANIC		
	☐ AFRICAN AMERICAN	☐ UNKNOWN	☐ UNKNOWN		

TEST RESULTS

DATE				
DATE	HBsAg	☐ POSITIVE/REACTIVE	☐ NEGATIVE/NON-REACTIVE	☐ NOT DONE
DATE	AntiHBc IgM	☐ POSITIVE/REACTIVE	☐ NEGATIVE/NON-REACTIVE	☐ NOT DONE
DATE	Anti-HBc (total)	☐ POSITIVE/REACTIVE	☐ NEGATIVE/NON-REACTIVE	☐ NOT DONE
DATE	Anti-HBs	☐ POSITIVE/REACTIVE ≥ 10 IU/mL	☐ NEGATIVE/NON-REACTIVE	☐ NOT DONE

PROPHYLAXIS		PROVIDER
DATE	HBIG	
DATE	HB Dose #1 Hep B Vac	
DATE	HB Dose #2 Hep B Vac	
DATE	HB Dose #3 Hep B Vac	
DATE	HB Dose #4 Hep B Vac (if needed, see Pink Book)	

FOR DHSS USE ONLY

CASE RESOLUTION DATE	REASON	DATE RECEIVED BY DHSS	DATE ENTERED INTO ARTEMIS	DATE ENTERED INTO MOHSIS
	☐ IMMUNITY DUE TO VACCINATION ☐ IMMUNITY DUE TO NATURAL INFECTION ☐ CHRONIC INFECTION			

NOTES

Please submit to Disease Investigation Unit of the Missouri Department of Health and Senior Services; P.O. Box 570; Jefferson City, MO 65102-0570. Telephone: 573-751-6113 FAX: 573-526-0235.

Instructions for the Perinatal Hepatitis B Case Management of HbsAg-Positive Pregnant or Newly Postpartum Women (IMMP-29), Infants and Contacts (IMMP-29A) Forms

Date of Report - The date the submitter completed and submitted the form to DHSS

Pregnancy Status – check one
Prenatal – Submitter identified HBsAg-positive woman during pregnancy.
Postnatal – Submitter identified HBsAg-positive woman after her infant was born.

DEMOGRAPHICS FOR HBsAg-POSITIVE PREGNANT OR NEWLY POSTPARTUM WOMEN Section

Name – Name of HBsAg-positive pregnant or newly postpartum woman

Date of Birth – Date of Birth of HBsAg-positive pregnant or newly postpartum woman

County – County of current residence of HBsAg-positive pregnant or newly postpartum woman

Address – Street address of HBsAg-positive pregnant or newly postpartum woman

City - City of residence of HBsAg-positive pregnant or newly postpartum woman

State – State of residence of HBsAg-positive pregnant or newly postpartum woman

ZIP Code – ZIP Code of residence of HBsAg-positive pregnant or newly postpartum woman

Work Telephone Number – Telephone number of HBsAg-positive pregnant or newly postpartum woman's employment

Home Telephone Number – Residence telephone number where HBsAg-positive pregnant or newly postpartum woman can be reached

Country of Birth – Name of the country the HBsAg-positive pregnant or newly postpartum woman was born

Race – Check the box of race the HBsAg-positive pregnant or newly postpartum woman considers herself to be (if woman considers herself more than one race check the appropriate boxes)

Ethnicity – Check the box of ethnicity HBsAg-positive pregnant or newly postpartum woman considers herself to be

Language – Write in the primary language the HBsAg-positive pregnant or newly postpartum woman speaks and uses in correspondence

CLINICAL INFORMATION

Expected Delivery Hospital Name – The name of the hospital the HBsAg-positive pregnant woman expects to deliver or newly postpartum woman delivered

Expected Delivery Date – The date HBsAg-positive pregnant woman says is the date her health care provider indicates she will deliver or the date the newly postpartum woman delivered

Actual Delivery Date – The date the HBsAg-positive pregnant or newly postpartum woman delivered her infant

Was This the Actual Delivery Hospital – Indicate yes or no - if no write in the name of the delivery hospital in the space indicated below

Address – Address of the expected delivery hospital

Physician's Name – Name of the physician the HBsAg-positive pregnant or newly postpartum woman indicates as the physician providing her prenatal and postnatal care

Provider's Telephone Number – The complete telephone number, including area code, of the physician the HBsAg-positive pregnant or newly postpartum woman indicates as the physician providing her prenatal and postnatal care

Clinic Name – Name of the clinic of the physician the HBsAg-positive pregnant or newly postpartum woman indicates as the physician providing her prenatal and postnatal care

Address – Address of the clinic physician the HBsAg-positive pregnant or newly postpartum woman indicates as the physician providing her prenatal and postnatal care

Provider Type – Indicate whether the physician the HBsAg-positive pregnant or newly postpartum woman indicates as the physician providing her prenatal and postnatal care is a private or public agency

Did She Receive Prenatal Care - Indicate "yes" if the HBsAg-positive pregnant or newly postpartum woman received any prenatal care. Indicate "no" if the HBsAg-positive pregnant or newly postpartum woman did not receive any prenatal care.

City – City of the clinic where the physician who provided prenatal or postnatal care of the HBsAg-positive pregnant or newly postpartum woman

State – State of the clinic where the physician who provided prenatal or postnatal care of the HBsAg-positive pregnant or newly postpartum woman

HEPATITIS B LABORATORY RESULTS

Date – Date of the laboratory results
HBsAg
Check the box and circle the laboratory results as reported -"positive" or "reactive"
or
Check the box and circle the laboratory results as reported - "negative" or "nonreactive"
or
Check the box if the laboratory test was "not done"

Date – Date of the laboratory results
Anti-HBc IgM
Check the box and circle the laboratory results as reported -"positive" or "reactive"
or
Check the box and circle the laboratory results as reported - "negative" or "nonreactive"
or
Check the box if the laboratory test was "not done"

Date – Date of the laboratory results
Anti-HBc
Check the box and circle the laboratory results as reported -"positive" or "reactive"
or
Check the box and circle the laboratory results as reported - "negative" or "nonreactive"
or
Check the box if the laboratory test was "not done"

Date – Date of the laboratory results
Other - Hepatitis B Test (write in name of the test)
Check the box and circle the laboratory results as reported -"positive" or "reactive"
or
Check the box and circle the laboratory results as reported - "negative" or "nonreactive"
or
Check the box if the laboratory test was "not done"

COMPLETED BY

Name – Name of the health care provider (submitter) completing the form (usually the LPHA staff)

Health Care Agency Name – Name of the health care agency the submitter completing the form

Address – Mailing address of the agency submitting the completed form

Telephone Number- Telephone number of the agency submitting the completed form City, State, and ZIP Code of the agency submitting the completed form

FOR DHSS USE ONLY

Date Received DHSS – Date stamp the date DHSS received the completed form

Region – Check the box to indicate the jurisdictional region where the HBsAg-positive pregnant or newly postpartum woman resides.

NW – Northwest
ST L CO – St. Louis County
CE – Central
St. L City – St. Louis City
ES – Eastern
KC – Kansas City
SW – Southwest
SE – Southeast

Date Entered into ARTEMSIS – The date the hospital the HBsAg-positive pregnant or newly postpartum woman's case information is entered into the DHSS - ARTEMIS case management data base

ARTEMIS Case Number – The case number ARTEMIS assigns the HBsAg-positive pregnant or newly postpartum woman

Date Entered into MOHSIS – The date the HBsAg-positive pregnant or newly postpartum woman's case information is entered into MOHSIS

IMMP-29 INFANT BORN TO HBsAg-POSITIVE WOMAN (side 2)

Infant's Medical Record or DCN Number – The case number assigned to identify the infant record

Infant's Date of Birth – The date the infant was born

INFANT DEMOGRAPHICS

Infant's Name - Beginning with the last name, infant's full legal name

Sex - Check “male” or “female” as appropriate for the infant
Mother’s Name – List the infant’s mother’s full legal name. If the infant is under the guardianship of someone other than the biological mother – write in the name and relationship as well

Is Infant’s Address The Same As the Mother’s – Check “yes” if the infant lives with the mother
- Check “No” if the infant lives with someone else and write in the address in the box below

INFANT’S CHEMOPROPHYLAXIS/VACCINATION RECORD

Date – The date the HBIG was administered to the infant born to an HBsAg-positive woman
Manufacturer and Lot Number – Write in the HBIG manufacturer name and the lot number

Provider Name and Address – Write in the health care provider name and address where the HBIG was administered

Telephone Number - Write in the telephone number of the health care provider or clinic where the HBIG was administered

Date – The date the Hepatitis B Vaccine was administered to the infant born to an HBsAg-positive woman

Manufacturer and Lot Number – Write in the Hepatitis B Vaccine manufacturer name and the lot number

Provider Name and Address – Write in the health care provider name and address where the Hepatitis B Vaccine was administered

Telephone Number - Write in the telephone number of the health care provider or clinic where the vaccine was administered

Vaccine Administration Tips

Consult the most recent edition of the Pink Book for information regarding Hepatitis B Vaccine and HBIG administration. The Pink Book may be viewed via the Internet at www.cdc.gov/nip.

1. Click on the Health Care Professional tab.
2. Scroll down to the Resources.
3. Click on Publications.
4. Scroll down to Textbooks, Manuals and Guidelines.

5. Click on **Epidemiology and Prevention of Vaccine-Preventable Diseases" textbook**
   ("The Pink Book", 9th edition; Jan. 2006).
6. Scroll down to **9th Edition Pink Book Online (Download) Chapters** of Pink book may be downloaded in two formats. Select one of the following:
   a. Original or
   b. Text- Only (for screen-reader devices)
7. Go to Chapter 15, Hepatitis B.

Post-vaccination serology Anti-HBs and HBsAg testing should be performed:

1. **after completion off the Hepatitis B vaccination series**
2. **after 9 months of age**
3. **usually performed at 9 to 15 months of age**
4. **most accurate when performed 1-2 months after the last dose of the series**

Date – Date of the laboratory results for post-vaccination serology testing of infant born to HBs positive woman
Anti-HBs - Hepatitis B Test (needs to be conducted on infant's born to HBsAg-positive women) The results of this test must be positive or reactive at greater than or equal to (≥) 10mIU/mL to considered immune.
Anti-HBs titers must be drawn in a timely manner to determine immunity status from vaccination. These titer's wane with time and immunity may not be determinable when testing is delayed beyond 2 months from the last dose of Hepatitis B Vaccine. This test must not be drawn on any infant younger than 9 months of age because of the potential of falsely measuring mother's antibodies.

Check the box and circle the laboratory results as reported -"positive" or "reactive"

or

Check the box and circle the laboratory results as reported - "negative" or "non-reactive"

or

Check the box if the laboratory test was "not done"

Date – Date of the laboratory results for post-vaccination serology testing of infant born to HbsAg-positive woman

HBsAg - Hepatitis B Test (needs to be conducted on infant's born to HBsAg-positive women)

Check the box and circle the laboratory results as reported -"positive" or "reactive"

or

Check the box and circle the laboratory results as reported - "negative" or "non-reactive"

or

Check the box if the laboratory test was "not done"

Note: HbsAg may be positive following immunization on about 18 days but is not indicative of infection.

TEST RESULTS INTERPRETATION TABLE

Reference guide to help with test result interpretation. For further information please refer to the current issue of the Pink Book.

NOTES

Write in notes pertinent to this case not covered elsewhere.

CASE DISPOSITION DATE AND REASON

To be completed by DHSS to document date and reason for case closure.

CASE CONTACT REPORT FOR CONTACTS OF PREGNANT HBsAg-POSITIVE WOMEN

Date of Report - The date the submitter completed and submitted the form to DHSS
Original Pregnant Female Name – Name of the HBsAg-positive pregnant woman associated with this contact

CONTACT #1 AND HOUSEHOLD CASE DEMOGRAPHIC (refers to individual contact of the HbsAg-positive woman)

Number of Adults In Household – Write in the number of adults living in the household

Number of Children In Household – Write in the number of children living in the household
(This helps determine the number of individuals at risk.)

Name – Name of Contact #1

Date of Birth – Date of Birth of Contact #1

Address – Street address of Contact #1

City - City of residence of Contact #1

State – State of residence of Contact #1

ZIP – ZIP Code of residence of Contact #1

County – County of residence of Contact #1

Work Telephone Number – Telephone number of Contact #1's employment

Home Telephone Number – Residence telephone number where Contact #1 can be reached

Country of Birth – Name of the country where Contact #1 was born

Race – Check the box of race the Contact #1 considers self to be (if Contact considers self more than one race check the appropriate boxes)

Ethnicity – Check the box of ethnicity Contact #1 considers self to be

Language – Write in the primary language Contact #1 speaks and uses in correspondence

Gender - Check "M" for male or "F" for female to identify the gender of Contact #1

HEPATITIS B LABORATORY RESULTS
(For Contact #1)

Date – Date of the laboratory results
HBsAg
Check the box and circle the laboratory results as reported -"positive" or "reactive"
or
Check the box and circle the laboratory results as reported - "negative" or "nonreactive"
or
Check the box if the laboratory test was "not done"

Date – Date of the laboratory results
Anti-HBc IgM
Check the box and circle the laboratory results as reported -"positive" or "reactive"
or
Check the box and circle the laboratory results as reported - "negative" or "nonreactive"
or
Check the box if the laboratory test was "not done"

Date – Date of the laboratory results
Anti-HBc
Check the box and circle the laboratory results as reported -"positive" or "reactive"
or

Check the box and circle the laboratory results as reported - “negative” or “nonreactive”

or

Check the box if the laboratory test was “not done”

Date – Date of the laboratory results for post-vaccination serology testing of infant born to HBs positive woman

Anti-HBs - Hepatitis B Test (needs to be conducted on infant’s born to HBsAg-positive women)

The results of this test must be positive or reactive at greater than or equal to (≥) 10mIU/mL to considered immune.

Anti-HBs titers must be drawn in a timely manner to determine immunity status from vaccination. These titer’s wane with time and immunity may not be determinable when testing is delayed beyond 2 months from the last dose of Hepatitis B Vaccine. This test must not be drawn on any infant younger than 9 months of age because of the potential of falsely measuring mother’s antibodies.

Check the box and circle the laboratory results as reported -“positive” or “reactive”

or

Check the box and circle the laboratory results as reported - “negative” or “nonreactive”

or

Check the box if the laboratory test was “not done”

Date – Date of the laboratory results

Other - Hepatitis B Test

Check the box and circle the laboratory results as reported -“positive” or “reactive”

or

Check the box and circle the laboratory results as reported - “negative” or “nonreactive”

or

Check the box if the laboratory test was “not done”

PROPHYLAXIS

Date – The date the HBIG was administered Contact #1

Provider Name and Address – Write in the name and address of the health care provider who administered the HBIG

Telephone Number - Write in the telephone number of the health care provider or clinic where the HBIG was administered

Date – the date the Hepatitis B Vaccine was administered to Contact #1

Provider Name and Address – Write in the name and address of the health care provider who administered the Hepatitis B Vaccine

Telephone Number - Write in the telephone number of the health care provider or clinic where the vaccine was administered

GUIDELINES

Consult the most recent edition of the Pink Book for information regarding Hepatitis B Vaccine and HBIG administration. May be viewed via the Internet at www.cdc.gov/nip.

FOR DHSS USE ONLY

Case Resolution Date – Date case was closed by DHSS

Reason – DHSS to determine reason case was closed

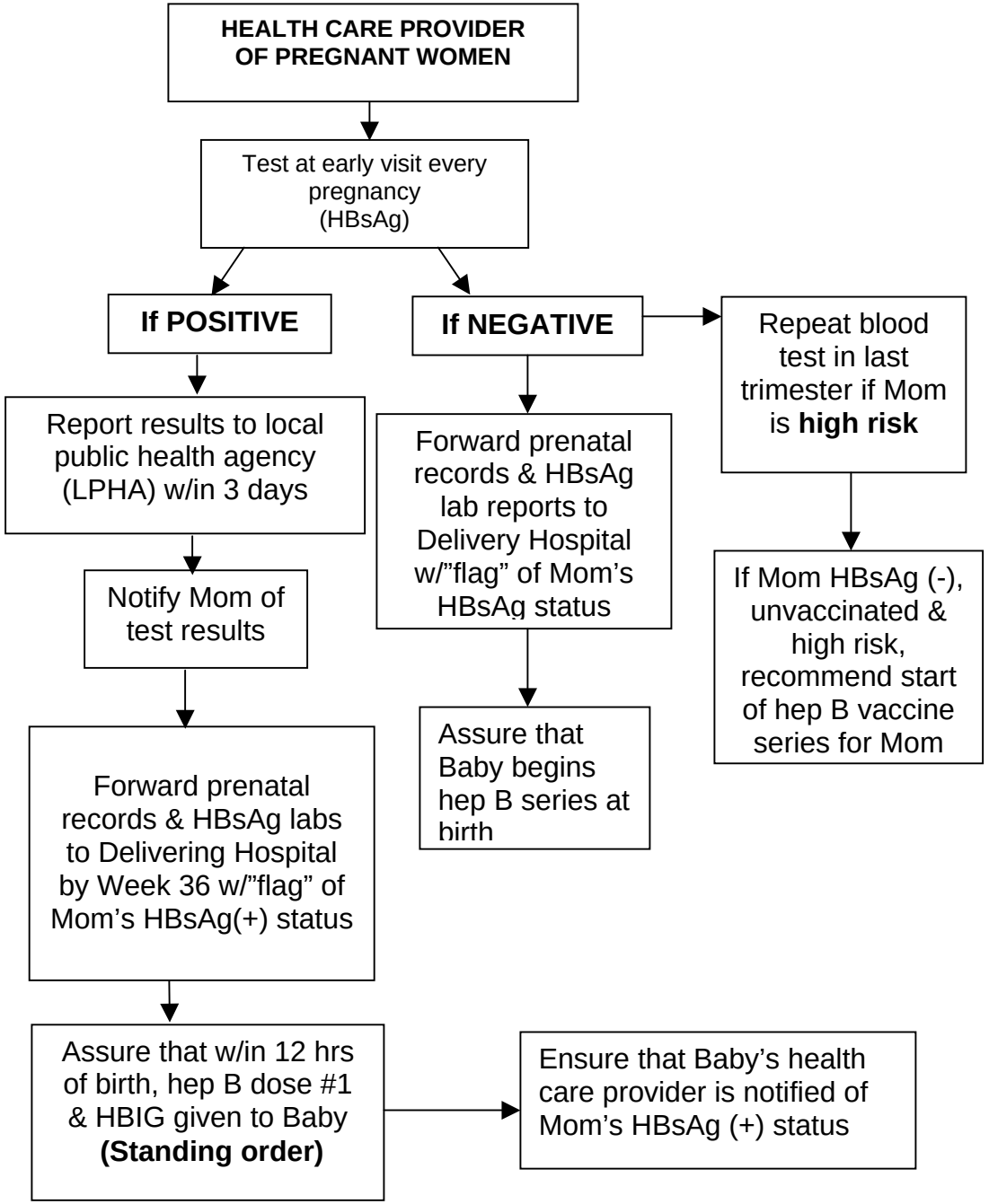
Date Received by DHSS – The date DHSS received the completed IMMP-29

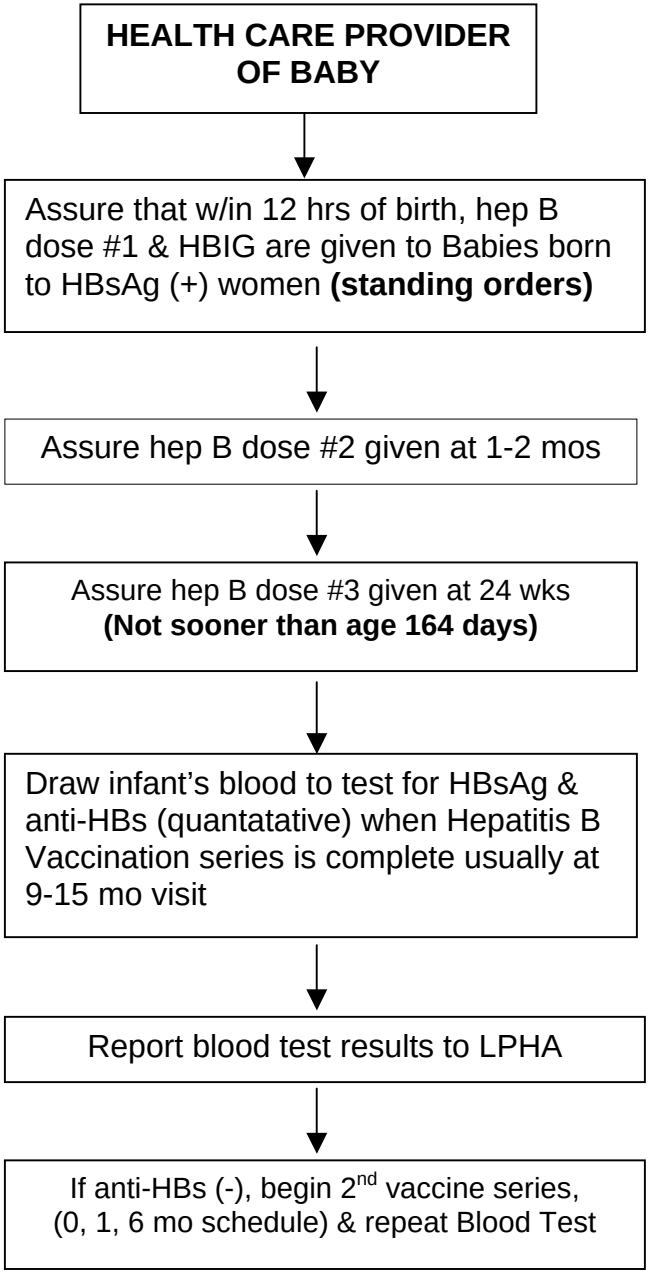
Date Entered Into ARTEMIS – The date DHSS entered the individual contact information into ARTEMIS (the Perinatal Hepatitis B Case Management Database) from the IMMP-29A completed by the LPHA

Date Entered Into MOHSIS – The date DHSS entered the individual contact information into MOHSIS from the IMMP-29A completed by the LPHA

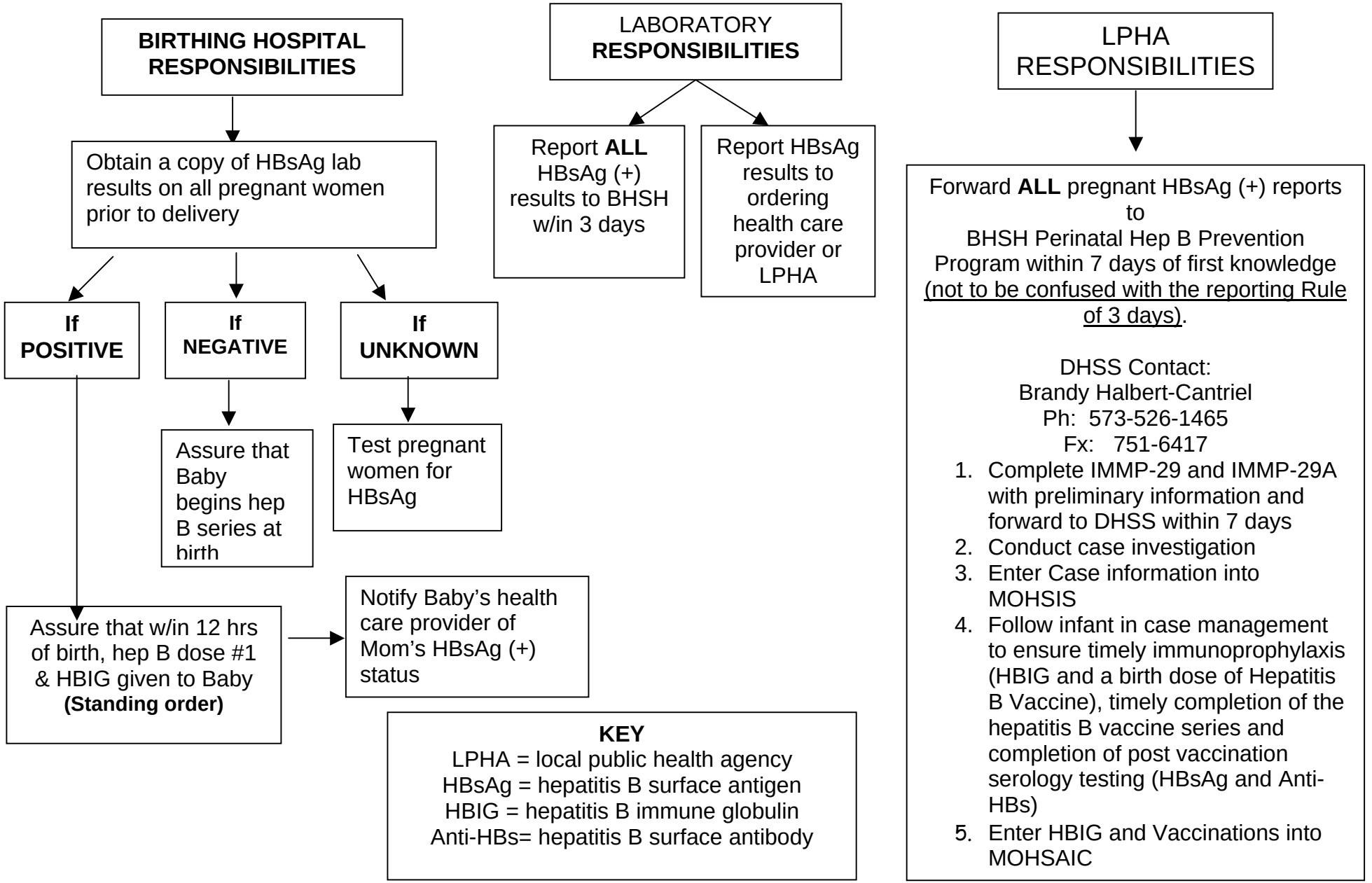
Repeat for contacts #2, #3 or more. Use as many forms as necessary to complete the contacts information.

Responsibilities for Care for HBsAg-positive Pregnant Women and Their Babies Flow Chart





Responsibilities for Care for HBsAg-positive Pregnant Women and Their Babies Flow Chart



GUIDELINES FOR PERINATAL HEPATITIS B CASE MANAGEMENT

PRENATAL SCREENING FOR HEPATITIS B

2. All pregnant women are to be screened for HBsAg during the initial prenatal visit (statute).
    a. Women of unknown HBsAg status who arrive for delivery should be tested for HBsAg on admission to the hospital.
    b. The test is described as follows.
        i. HBsAg - Hepatitis B Surface Antigen
        ii. HBsAg is an early indicator of acute HBV infection.
        iii. HBsAg remains detectable in the blood six months or longer in chronic HBV infection.
3. Testing should be repeated during late pregnancy for HBsAg-negative women who are at continued risk of HBV infection or who have had clinical hepatitis. Women at continued risk include those who:
    a. use injection drugs;
    b. are co-infected with sexually transmitted diseases;
    c. have unprotected sex with an infected partner(s); or
    d. have unprotected sex with a partner(s) of unknown hepatitis B status since her last HBsAg test.
4. For pregnant women who have no other means to pay for hepatitis B testing, health care providers may submit prenatal serological specimens for HBsAg screening to the State Public Health Laboratory (SPHL).
5. Private physicians or LPHAs may submit specimens to any laboratory performing a standard test for HBsAg. The laboratory must report all HBsAg-positive prenatal specimens to the DHSS, Bureau of HIV, STD, and Hepatitis (BHSH) within three days.
6. Contact the SPHL Virology Department to request laboratory forms, instructions and specimen collection kits for submitting blood specimens to the SPHL at 573-751-3334.
7. The SPHL will notify the submitter and the BHSH of HBsAg-positive prenatal patients.
8. The LPHA responsible for the county where the HBsAg-positive woman resides should initiate the investigation and coordinate the hepatitis B screening of household, needle-sharing, and sexual contacts of the prenatal patient.

The local public health agency (LPHA) will be responsible for the following.

1. Completing the Prenatal Hepatitis B Case Management Form For HBsAg-positive Pregnant or Newly PostPartum Women Form (IMMP-29).
2. Completing the Case Contact Report for Contacts of Pregnant HBsAg-positive Women Form (IMMP-29A).
3. Collecting serological specimens from all contacts.
4. Sending specimens to the SPHL.
5. Ensuring that all susceptible household, needle-sharing, and sexual contacts receive HBIG and/or hepatitis B vaccine according to current Advisory Committee on Immunization Practices (ACIP) recommendations.
6. Conduct interviews with the HBsAg-positive prenatal women and obtain information about susceptible household, sexual, and needle-sharing contacts in order to meet with the contacts and determine their immune status.
7. Information obtained during the interview is to be recorded on the Prenatal Hepatitis B Case Report Form and the Perinatal Hepatitis B Contact Report Form and submitted to BHSH within seven days of the interview.
8. Help arrange testing and immunoprophylaxis as needed.
9. Contact the BHSH for assistance with these activities as needed.

HBsAg-POSITIVE PREGNANT WOMEN

HBsAg-positive pregnant women should receive counseling regarding the need for:

1. Preventing the transmission of HBV to her baby and others;
2. Ongoing medical follow-up to monitor the progression of her disease; and
3. Immunoprophylaxis, vaccination, and post-vaccination serology testing needs of her baby.
    a. Babies born to HBsAg-positive women should receive HBIG and a dose of monovalent hepatitis B vaccine within 12 hours of birth.
    b. A second hepatitis B vaccine dose should be given at 1 to 2 months of age.
    c. A third dose administered at 6 months of age to complete the vaccination series
    d. Some infants may receive combination vaccines, and these should be given according to the current ACIP guidelines (see http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5416a1.htm).

Notes

Please file with your case records and remit a completed copy to The Missouri Department of Health and Senior Services, Bureau of HIV, STD, and Hepatitis, Perinatal Hepatitis B Program; P.O. Box 570, Jefferson City, MO 65102, Telephone: 573-751-6439 or by fax: 573-751-6447. These are supplemental notes forms to be used as needed in conjunction with the IMMP-29 and IMMP-29A forms.

SAFER·HEALTHIER·PEOPLE™

www.CDC.gov/hepatitis

July 27, 2007

Hepatitis B Fact Sheet

DESCRIPTION	Hepatitis B is a serious disease caused by a virus that attacks the liver. The virus, which is called hepatitis B virus (HBV), can cause lifelong infection, cirrhosis (scarring) of the liver, liver cancer, liver failure, and death. Hepatitis B vaccine is available for all age groups to prevent hepatitis B virus infection.	
SIGNS & SYMPTOMS	About 30% of persons have no signs or symptoms. Signs and symptoms are less common in children than adults.	
	• jaundice • fatigue • abdominal pain	• loss of appetite • nausea, vomiting • joint pain
CAUSE	• Hepatitis B virus (HBV)	
TRANSMISSION	• Occurs when blood from an infected person enters the body of a person who is not infected. • HBV is spread through having sex with an infected person without using a condom (the efficacy of latex condoms in preventing infection with HBV is unknown, but their proper use might reduce transmission), by sharing drugs, needles, or "works" when injecting drugs, through needlesticks or sharps exposures on the job, or from an infected mother to her baby during birth. Persons at risk for HBV infection might also be at risk for infection with hepatitis C virus (HCV) or HIV.	
RISK GROUPS	• Persons with multiple sex partners or diagnosis of a sexually transmitted disease • Men who have sex with men • Sex contacts of infected persons • Injection-drug users • Household contacts of chronically infected persons	• Infants born to infected mothers • Infants/children of immigrants from areas with high rates of HBV infection (country listing) • Health-care and public safety workers with exposure to blood (View current post-exposure prophylaxis recommendations) • Hemodialysis patients
PREVENTION	• Hepatitis B vaccine is the best protection. • If you are having sex, but not with one steady partner, use latex condoms correctly and every time you have sex. The efficacy of latex condoms in preventing infection with HBV is unknown, but their proper use might reduce transmission. • If you are pregnant, you should get a blood test for hepatitis B. Infants born to HBV-infected mothers should be given HBIG (hepatitis B immune globulin) and vaccine within 12 hours after birth. • Do not shoot drugs; if you shoot drugs, stop and get into a treatment program; if you can't stop, never share drugs, needles, syringes, water, or "works", and get vaccinated against hepatitis A and B. • Do not share personal care items that might have blood on them (razors, toothbrushes). • Consider the risks if you are thinking about getting a tattoo or body piercing. You might get infected if the tools have someone else's blood on them or if the artist or piercer does not follow good health practices.	

	• If you have or had hepatitis B, do not donate blood, organs, or tissue. • If you are a health-care or public safety worker, get vaccinated against hepatitis B, and always follow routine barrier precautions and safely handle needles and other sharps (view current post-exposure prophylaxis recommendations).
VACCINE RECOMMENDATIONS	• Hepatitis B vaccine has been available since 1982. • Routine vaccination of 0-18 year olds • Vaccination of risk groups of all ages
LONG-TERM EFFECTS WITHOUT VACCINATION	Chronic infection occurs in: • 90% of infants infected at birth • 30% of children infected at age 1–5 years • 6% of persons infected after age 5 years Death from chronic liver disease occurs in: • 15%–25% of chronically infected persons
CONTRAINDICATIONS TO VACCINE	• A serious allergic reaction to a prior dose of hepatitis B vaccine or a vaccine component is a contraindication to further doses of hepatitis B vaccine. The recombinant vaccines that are licensed for use in the United States are synthesized by *Saccharomyces cerevisiae* (common bakers' yeast), into which a plasmid containing the gene for HBsAg has been inserted. Purified HBsAg is obtained by lysing the yeast cells and separating HBsAg from the yeast components by biochemical and biophysical techniques. Persons allergic to yeast should not be vaccinated with vaccines containing yeast.
TREATMENT & MEDICAL MANAGEMENT	• HBV infected persons should be evaluated by their doctor for liver disease. • Adefovir dipivoxil, interferon alfa-2b, pegylated interferon alfa-2a, lamivudine, entecavir, and telbivudine are six drugs used for the treatment of persons with chronic hepatitis B. • These drugs should not be used by pregnant women. • Drinking alcohol can make your liver disease worse.
TRENDS & STATISTICS	• Number of new infections per year has declined from an average of 260,000 in the 1980s to about 60,000 in 2004. • Highest rate of disease occurs in 20-49-year-olds. • Greatest decline has happened among children and adolescents due to routine hepatitis B vaccination. • Estimated 1.25 million chronically infected Americans, of whom 20-30% acquired their infection in childhood.