

# Hepatitis B

## Summary

Hepatitis B is a liver infection caused by the Hepatitis B virus (HBV). Hepatitis B is transmitted when blood, semen, or another body fluid from a person infected with the Hepatitis B virus enters the body of someone who is not infected. Hepatitis B virus (HBV) causes acute, chronic hepatitis B infection and perinatal hepatitis B (Acquired in the United States or U.S. Territories)

## Agent

Hepatitis B virus (HBV) is a DNA containing, 42 -nm-diameter hepadnavirus. Main component of viral particle is an outer lipoprotein envelope containing HBsAg and an inner nucleocapsid consisting of hepatitis B core antigen (anti-HBc). HBV can survive outside the body at least 7 days.

## Transmission

Reservoir:

Humans, Chimpanzees are susceptible, however an animal reservoir in nature has not been recognized.

Mode of Transmission:

- HBV is transmitted through activities that involve percutaneous (i.e., puncture through the skin) or mucosal contact with infectious blood or body fluids (e.g., semen, saliva), including,
- Sex with an infected partner.
- Injection drug use that involves sharing needles, syringes, or drug-preparation equipment.
- Birth to an infected mother.
- Contact with blood or open sores of an infected person.
- Needle sticks or sharp instrument exposures.
- Sharing items such as razors or toothbrushes with an infected person.

Period of communicability:

All persons who are HBsAg-positive are potentially infectious. The infectivity of chronically infected individuals varies from high (HBeAg-positive, HBV-DNA above  $10^5$  copies/ml) to modest (anti-HBe-positive).

## Clinical Disease:

Incubation period:

An average of 90 days (range: 60–150 days) after exposure to HBV.

Illness:

Acute infection ranges from asymptomatic or mild disease to — rarely — fulminant hepatitis. Symptoms includes fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, clay-colored bowel movements, joint pain and jaundice. Symptoms typically last for several weeks but can persist for up to 6 months. Majority of chronic Hepatitis B remain asymptomatic until onset of cirrhosis or end-stage liver disease.

## Diagnosis

Clinical Criteria:

Acute Hepatitis B:

An acute illness with a discrete onset of any sign or symptom\* consistent with acute viral hepatitis (e.g., fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, and abdominal pain), and either a) jaundice, or b) elevated serum alanine aminotransferase (ALT) levels >100 IU/L.

\*A documented negative hepatitis B surface antigen (HBsAg) laboratory test result within 6 months prior to a positive test (either HBsAg, hepatitis B "e" antigen (HBeAg), or hepatitis B virus nucleic acid testing (HBV NAT) including genotype) result does not require an acute clinical presentation to meet the surveillance case definition.

Chronic Hepatitis B:

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

Perinatal hepatitis B:

Perinatal HBV infection in a child  $\leq$  24 month of age may range from asymptomatic to fulminant hepatitis.

## Treatment

For acute infection, no medication is available; treatment is supportive.

There are several antiviral medications for persons with chronic infection. Persons with chronic HBV infection require linkage to care with regular monitoring to prevent liver damage and/or hepatocellular carcinoma.

## Surveillance

*Laboratory criteria –*

*Acute Hepatitis B:*

- HBsAg positive, AND
- Immunoglobulin M (IgM) antibody to hepatitis B core antigen (IgM anti-HBc) positive (if done)

Confirmed Acute Hepatitis B:

A case that meets the clinical case definition, is laboratory confirmed, and is not known to have chronic hepatitis B.

*Chronic Hepatitis B:*

- Immunoglobulin M (IgM) antibodies to hepatitis B core antigen (IgM anti-HBc) negative AND a positive result on one of the following tests: hepatitis B surface antigen (HBsAg), hepatitis B e antigen (HBeAg), or nucleic acid test for hepatitis B virus DNA (including qualitative, quantitative and genotype testing), or

- HBsAg positive or nucleic acid test for HBV DNA positive (including qualitative, quantitative and genotype testing) or HBeAg positive two times at least 6 months apart (Any combination of these tests performed 6 months apart is acceptable)

*Probable Chronic Hepatitis B:*

A person with a single HBsAg positive or HBV DNA positive (including qualitative, quantitative and genotype testing) or HBeAg positive lab result and does not meet the case definition for acute hepatitis B.

*Confirmed Chronic Hepatitis B:*

A person who meets either of the above laboratory criteria for diagnosis.

*Perinatal Hepatitis B:*

- Positive hepatitis B surface antigen (HBsAg) test (only if at least 4 weeks after last dose of Hep B vaccine).
- Positive hepatitis B e antigen (HBeAg) test.
- Detectable HBV DNA

Epidemiologic Linkage; Born to a HBV-infected mother.

*Probable Perinatal Hepatitis B:*

Child born in the US and positive for HBsAg at  $\geq 1$  month of age and  $\leq 24$  months of age OR positive for HBeAg or HBV DNA  $\geq 9$  months of age and  $\leq 24$  months of age, but whose mother's hepatitis B status is unknown (i.e. epidemiologic linkage not present).

*Confirmed Perinatal Hepatitis B:*

Child born in the US to a HBV-infected mother and positive for HBsAg at  $\geq 1$  month of age and  $\leq 24$  months of age OR positive for HBeAg or HBV DNA  $\geq 9$  months of age and  $\leq 24$  months of age.

Reporting:

Report all suspected or confirmed cases of Hepatitis B immediately to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider. ERD will collect clinical and laboratory information, assist in the shipment of antitoxin for treatment, and arrange for specimen testing at CDC. Information should also be entered into NM-EDSS per established procedures.

Case Investigation:

When 2 or more cases occur in association with some common exposure, search for additional cases. Institute strict aseptic techniques. If a plasma derivative such as antihemophilic factor, fibrinogen, pooled plasma or thrombin is implicated, withdraw the lot from use and trace all recipients of the same lot in a search for additional cases.

## Control Measures

1. Case management
  - a. Report local health authority.
  - b. Isolation: universal precautions to prevent exposure to blood and body fluids.
  - c. Concurrent disinfection: Of equipment contaminated with blood or infectious body fluids.

- d. Quarantine: Not applicable.
  - e. No specific treatment available for Acute Hepatitis B. Treatment is supportive.
2. Contact management
- Immunization of contacts with hepatitis B vaccine and when indicated HBIG as soon as possible.
- Further guidance on post-exposure prophylaxis Hepatitis B can be found at <https://www.cdc.gov/hepatitis/hbv/pep.htm>
3. Prevention
- 3.1. Preventing perinatal HBV transmission by screening all pregnant women for HBsAg and providing immune-prophylaxis to infants of HBV-infected women;
  - 3.2. routine immunization of all infants;
  - 3.3. vaccinate of all previously unvaccinated children aged <19 years, with priority for vaccination at 11 to 12 years of age;
  - 3.4. vaccination of adolescents and adults at high risk for infection including persons with a history of multiple sex partners or a sexually-transmitted disease; men who have sex with men; injecting drug users; incarcerated persons; household and sex contacts of persons with chronic HBV infection; health care and public safety workers who have exposure to blood in the workplace; and hemodialysis patients.
4. Outbreak
- Outbreak Definition: The occurrence of  $\geq 2$  cases of Hepatitis B in association with a common exposure is considered an outbreak.
- Notify Epidemiology and Response Division (ERD) immediately at 505-827-0006.
- Further guidance on investigating Hepatitis B outbreaks cases that are suspected to be related to healthcare delivery can be found at: [www.cdc.gov/hepatitis/Outbreaks/index.htm](http://www.cdc.gov/hepatitis/Outbreaks/index.htm)

## Management of Hepatitis B in Child Care Centers

Persons should not be excluded from child care centers.

## References

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See Hepatitis B Fact Sheets ([English](#)) ([Spanish](#)).