Alberta

Public Health Disease Management Guidelines

Hepatitis B – Acute and Chronic

Alberta

Ministry of Health, Government of Alberta

November 2018

Hepatitis B Public Health Disease Management Guideline

http://www.health.alberta.ca/professionals/notifiable-diseases-guide.html

For further information on the use of this protocol contact:

Health.CD@gov.ab.ca

Health and Wellness Promotion Branch

Public Health and Compliance Branch

Alberta Health

Case Definition

Acute Case

Confirmed	• Laboratory confirmation of infection with clinical illness[(A)] or probable exposure within the last 6 months: - Immunoglobulin M antibody to Hepatitis B core antigen (anti-HBc IgM) positive **AND** one of the following: - Hepatitis B surface antigen (HBsAg) positive; ***or*** - HBV DNA positive. **OR** • Clearance of HBsAg within a 6 month period in a person who was documented HBsAg positive with a history of clinical illness[(A)] or probable exposure.
Probable	Acute clinical illness[(A)] in a person who is epidemiologically linked to a confirmed case (acute or chronic).

Chronic Carrier

Confirmed	Laboratory confirmation of infection with or without clinical illness[(A)]: • Detection of Hepatitis B surface antigen (HBsAg) ***or*** HBV DNA ***or*** HBeAg for more than 6 months; **OR** • Immunoglobulin M antibody to Hepatitis B core antigen (anti-HBc IgM) negative **AND** at least one of the following: - HBsAg positive; ***or*** - HBV DNA positive; ***or*** - HBeAg positive; **OR** • Total antibody to Hepatitis B core antigen (anti-HBc total) positive **and** HBV DNA positive; **and** - HBsAg negative and Antibody to Hepatitis B Surface Antigen (anti-HBs) negative
Probable	Laboratory confirmation of infection: • Single HBsAg positive in the context of: - history of clinical illness more than 6 months ago; ***or*** - self-reported history of Hepatitis B testing and/or diagnosis more than 6 months ago; ***or*** - born and/or lived in Hepatitis B endemic country (prevalence ≥8%) more than 6 months ago.

[(A)] Clinical illness: a discrete onset of symptoms (e.g. fever, headache, malaise, anorexia, nausea, vomiting, abdominal pain, dark urine) and either jaundice or elevated serum aminotransferase level.

Reporting Requirements

1. Physicians/Health Practitioners and others

A physician, health practitioner or others shall notify the Medical Officer of Health (MOH) (or designate) of the zone, of all confirmed and probable cases in the prescribed form by mail, fax or electronic transfer within 48 hours (two business days).

2. Laboratories

All laboratories shall report all positive laboratory results by mail, fax or electronic transfer within 48 hours (two business days) to the MOH (or designate) of the zone and the Chief Medical Officer of Health (CMOH) (or designate).

3. Alberta Health Services and First Nations and Inuit Health Branch

- The MOH (or designate) of the zone where the case currently resides shall forward the initial Notifiable Disease Report (NDR) of all confirmed and probable cases to the CMOH (or designate) within four weeks of notification and the final NDR (amendment) within ten weeks of notification.
- For out-of-province and out-of-country reports, the following information should be forwarded to the CMOH (or designate) by phone, fax or electronic transfer within 48 hours (two business days) including:
  - name,
  - date of birth,
  - out-of-province health care number,
  - out-of-province address and phone number,
  - positive laboratory report, and
  - other relevant clinical/epidemiological information.

4. Other Reporting Requirements

- Canadian Blood Services (CBS): All persons testing positive must be reported by the MOH (or designate) to CBS within two business days if:
  - the person has a history of donating blood/blood products ***or***
  - the person received blood/blood products in Canada when blood transfusion is the only risk factor identified.
- A copy of the positive test result must accompany the Transmissible Disease Notification (TDN) form, and all information should be sent for Lookback/Traceback to the TDN Department by:
  - Fax 1-844-836-6843 **OR**
  - Scan & email to: TDnotifications@blood.ca
- To speak to a TDN Specialist regarding any questions or concerns please call: (506) 648-5076 or 1-888-992-5663 ext. 5076.

Epidemiology

Etiology

The hepatitis B virus (HBV) is a DNA virus, in the hepadnavirus family. It consists of an inner nucleocapsid core (the hepatitis B core antigen [HBcAg]) which is surrounded by an outer lipoprotein coat containing the hepatitis B surface antigen (HBsAg).[1,2] The virus primarily infects liver cells and causes both acute and chronic hepatitis B infection.[3]

Clinical Presentation

Individuals infected with acute hepatitis B infection may be asymptomatic or symptomatic. Less than 10% of children and 30 – 50% of adult acute cases will have icteric disease. In persons with clinical illness, onset is usually subtle with vague abdominal discomfort, loss of appetite, nausea, vomiting, sometimes arthralgia and rash often progressing to jaundice. Acute illness may last up to 3 months. The case-fatality rate is about 1 – 2% and is higher in those over 40 years of age.[2,4]

Most adults with acute HBV infection recover completely and produce neutralizing antibodies, resulting in immunity from future disease.[3] Following acute HBV infection, the risk of developing chronic infection varies inversely with age. As many as 90% of infants infected at birth or during the first year of life, as well as 25% to 50% of children infected between one and five years of age will develop chronic infection. The risk of acquiring chronic infection in persons infected as older children and adults is approximately 5% to 10%. In addition, individuals with underlying chronic conditions or who are immunocompromised have an increased risk of developing chronic HBV.[1,2]

Persons with chronic infection may or may not have a history of clinical hepatitis. If clinical illness is present, symptoms may include fatigue, nausea, anorexia, arthralgia, myalgia, right upper quadrant tenderness, dark urine, clay colored/light stools and jaundice. Serum aminotransferase levels may be normal or mildly to moderately elevated. Individuals symptomatic with jaundice, ascites, encephalopathy, splenomegaly or pedal edema may have cirrhosis.[3,5] Chronic HBV carriers have an increased risk of developing hepatocellular carcinoma and cirrhosis.

Reservoir

Humans.[2]

Transmission

Transmission is through mucosal and percutaneous contact with infected blood and body fluids. HBsAg has been detected in saliva, human milk and tears but the most potentially infectious body fluids are blood, serum, semen, vaginal secretions and cerebrospinal, pleural, synovial, peritoneal, pericardial and amniotic fluids.[1] The principal routes of transmission are:

- percutaneous (e.g. injection drug use, exposure to blood or body fluid),
- sexual (e.g., heterosexual or men who have sex with men (MSM)),
- vertical (i.e., mother to infant during pregnancy or birth),
- horizontal (e.g., between household contacts through skin lesions or sharing of blood-contaminated toothbrushes and razors).[4]

Infections also occur in settings of close personal contact through unrecognised exposure to infectious body fluids. HBV is stable on environmental surfaces for at least seven days and can therefore be transmitted indirectly via inanimate objects.[2] In Canada, the risk of transmission from screened and donated blood, manufactured blood products, and transplanted organs is minimal due to donor screening and processing of blood products.[4]

Incubation Period

The incubation period for acute infections is 45 to 180 days, with an average of 60 to 90 days. It may be as short as two weeks to the appearance of HBsAg, and rarely as long as six to nine months. The variation is related in part to the amount of virus in the inoculum, the mode of transmission, and host factors.[1]

Period of Communicability

Individuals who are HBsAg positive are potentially infectious and the risk is highest during the acute phase of illness.[2,4] If the person is symptomatic, HBsAg can be detected 1 – 2 months before and after symptom onset. Chronic HBV carriers remain infectious indefinitely.

Host Susceptibility

Susceptibility is universal. Protective immunity follows infection if Hepatitis B surface antibody (anti-HBs) develops and HBsAg becomes negative.

Individuals who do not have documented history of receiving a valid and age appropriate series of hepatitis B vaccine and who do not have a positive report of a protective level of anti-HBs (≥10 IU/L) are considered susceptible.

Incidence in Alberta

Acute hepatitis B cases became reportable in Alberta in 1969 and chronic cases in 2008.[6] A hepatitis B immunization program for high-risk infants was introduced in Alberta in 1985 and a routine school-based program was introduced in 1995.[7] Since 2006, there has been an increase in reported cases of hepatitis B likely due to a change in screening criteria and a rise in the number of people from high hepatitis B endemic countries (prevalence ≥8%) moving to Alberta.[4,8] Immigrants from hepatitis B endemic countries account for the most number of chronic cases reported in Alberta.[6]

The most common risk factors identified in Alberta include: sexual exposure, drug addiction (including illicit drugs, alcohol and prescription drugs), piercings and tattoos, smoking and sharing of personal hygiene equipment.[6] For more information on current incidence rates and case counts of hepatitis B in Alberta, refer to the Interactive Data Health Application.

Public Health Management

Diagnosis

Different serologic tests are used to determine if a person has an acute or chronic hepatitis B infection. The tests are:

- HBsAg (hepatitis B surface antigen)
- anti-HBc IgM (immunoglobulin (IgM) antibody to hepatitis B core antigen)
- anti-HBc total (total antibody to hepatitis B core antigen)
- HBV DNA
- HBeAg (hepatitis B envelope antigen)
- Anti-HBs (antibody to hepatitis B surface antigen)

HBsAg is the first serological marker seen in HBV infection (acute or chronic) and can be detected in serum from 1-2 weeks to 11-12 weeks after exposure or indefinitely in chronic infections. HBsAg usually disappears in 4- 6 months, with antibody to hepatitis B surface (anti-HBs), developing approximately 8 months after infection.[5] Antibody to hepatitis B core (anti-HBc) indicates either current or past HBV infection.[9] Testing for anti-HBc total includes the detection of both anti-HBc IgM and anti-HBc IgG. Anti-HBc total is usually the second serological marker to appear in acute infection and continues to be present indefinitely. Anti-HBc IgM is present in high titre in acute cases and usually disappears within six months. It may be the only marker of infection during the 'window period', which is the time between when HBsAg disappears and anti-HBs appears.[5,9] See Diagram 1.

Diagram 1: Typical Course of Hepatitis B: Acute with recovery (L) and Chronic (R)[10]

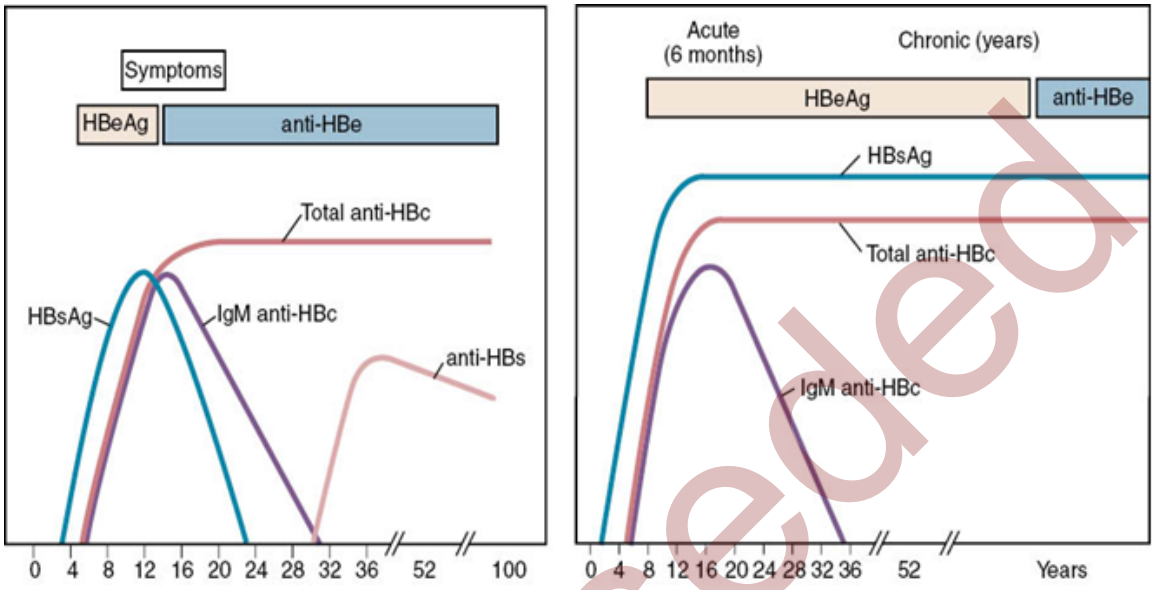

Figure 146-8 Typical course of hepatitis B. Left, Typical course of acute hepatitis B. **Right,** Chronic hepatitis B. HBc, hepatitis B core; HBe, hepatitis B early; HBsAg, hepatitis B surface antigen; IgM, immunoglobulin M.

Hepatitis B e antigen (HBeAg), is sometimes present in infected individuals and is associated with increased levels of viral replication and increased infectivity. Testing for HBV DNA is not routinely performed during public health follow up, but may be done in individuals on treatment, those being monitored by hepatitis specialists and for patients with unusual HBV serologic markers, e.g., who are only positive for anti-HBc total (HBsAg negative and anti-HBs negative) for clarification of their status. It may be used to assess the degree of infectivity. For more information, refer to Tables 1 and 2.

Table 1: Hepatitis B Serological Markers

Positive Marker	Interpretation
HBsAg Hepatitis B surface antigen	This is the first detectable and primary marker of HBV infection. Indicates current acute infection or chronic infection if it persists for more than 6 months.
Anti-HBs Antibody to Hepatitis B surface antigen	Immunity either from infection or vaccine
Anti-HBc IgM Immunoglobulin M (IgM) antibody to Hepatitis B core antigen	Infection with HBV ≤ 6 months' duration indicates acute infection. May sometimes be observed in exacerbations of chronic infection
Anti-HBc Antibody to Hepatitis B core total	Appears at the onset of symptoms in acute infection and persists for life. Indicates past or current infection. Not present after immunization.
HBeAg Hepatitis B envelope antigen	Associated with high levels of HBV replication and indicates infectiousness. Can be present in both acute & chronic infections
HBV DNA	Measures level of circulating DNA and is a marker of infectivity. Usually used to determine need for treatment

Table 2: Interpretation of Serologic Test Results for HBV

HBsAg	Anti-HBc IgM	Anti-HBc Total	Anti-HBs	HBV DNA	Interpretation
+	**-**	**-**	**-**	**n/a**	Early HBV infection before anti-HBc response, or transiently seen in early response to immunization
+	**+**	**+**	**-**	**n/a**	Early HBV infection. Since anti-HBc IgM is positive, the onset is within 6 months. IgG antibody usually appears shortly after IgM; therefore, both are usually positive when IgM is positive.(Acutely infected)
-	**+**	**+**	**- or +**	**n/a**	Recent acute HBV infection (within four to six months) with resolution; i.e., HBsAg has already disappeared. Anti-HBs usually appears within a few weeks or months of HBsAg disappearance.
+	**-**	**+**	**-**	**n/a**	HBV infection onset at least six months earlier because Anti-HBc IgM has disappeared. Probable chronic HBV infection. (Chronically infected)
-	**-**	**-**	**+**	**n/a**	Response to hepatitis B vaccine. No evidence of infection.
- or +	**-**	**+**	**-**	**+**	Chronic HBV infection.
-	**-**	**+**	**+**	**n/a**	Past HBV infection, recovered. (Immune due to natural infection).
-	**-**	**+**	**-**	**-**	There are four possible interpretations:* 1: May be recovering from acute infection. 2: May be distantly immune from past. infection and the test is not sensitive enough to detect a very low level of Anti-HBs 3: May be susceptible with a false positive Anti-HBc. 4: May be chronically infected and have undetectable level of HBsAg.

n/a = not routinely performed as part of public health follow-up
**Consultation with a specialist is recommended for interpretation and diagnosis*

Key Investigation

- Confirm the diagnosis (acute or chronic infection) as per the case definition.
- Assess risk factors/behaviors for hepatitis B infection including:
  - being born to a mother who is HBV positive,
  - household contact of a known hepatitis B carrier or acute case,
  - having unprotected sexual contact with someone who is HBV positive or having multiple sexual partners,
  - current or past history of sexually transmitted infection (STI),
  - men who have sex with men (MSM),
  - injection drug use (current or past history) and sharing of contaminated needles and other drug use paraphernalia e.g., cookers, straws, pipes,
  - current or past history of incarceration,
  - receipt of blood/tissue/organ prior to 1970,
  - receipt of blood/tissue/organ or invasive medical/dental procedures at any time in a developing country,
  - frequent receipt of blood or blood products,
  - skin piercing procedures e.g., tattooing, body piercing, acupuncture with unsterile equipment or technique,
  - history of workplace or non-occupational blood or body fluid exposure,
  - recent invasive medical or dental procedures (e.g., hemodialysis),
  - resident or staff of institution for the developmentally challenged, and
  - immigration from or to a known hepatitis B endemic country (prevalence ≥8%),
- Determine co-infection with other blood-borne infections.
- Determine hepatitis B immunization history.
- If female, determine pregnancy status.
- Determine history of blood, tissue or organ donation (when and where).
- Determine occupation i.e. health care worker (HCW), or other occupation where there is potential for occupational blood/body fluid exposure events.
- Identify household and other close contacts (as defined below) with potential blood/body fluid exposure:
  - Persons living in the household,
  - Needle sharing partners,
  - Persons who share personal care items e.g., razors, toothbrushes,
  - Short and long term sexual partners, and
  - Persons with other blood/body fluid exposure e.g., unprotected first aid.

Management of Acute Case and Chronic Carrier

- Educate on signs and symptoms of disease, modes of transmission and ways to reduce infection risk to others.
- All acute cases and chronic carriers who are pregnant should be referred, by their responsible physician, to a hepatologist or infectious disease specialist for assessment and follow-up during pregnancy to decrease possible transmission to the infant.
- Chronic carriers should be referred, by their responsible physician, to a hepatologist or infectious disease specialist for assessment and management recommendations.
- Discuss the importance of identifying any contacts that may have been exposed so that public health follow-up of those contacts can be arranged.
- Provide information on community support agencies and how to access support and services
- Routine practices apply for hospitalized patients.
- Refer to Table 3 for other recommendations.

Table 3: Other Management Recommendations

Acute Cases	Chronic Carriers
• Test for HBsAg and anti-HBs after 6 months to determine if case has cleared the infection or whether a chronic carrier status has developed. If testing has been completed sooner and loss of HBsAg and positive anti-HBs is demonstrated, repeat testing at 6 months is not necessary. • If at 6 months, serology results show HBsAg and Anti-HBs negative then case may potentially be in the window period. • If so, then retest at 6 month intervals to determine if they have recovered (Anti-HBs develops) or developed a chronic infection (HBsAg reappears).	• Eligible for provincially funded Hepatitis A vaccine and Pneumo-P (Pneumococcal Polysaccharide 23). Refer to the current *Alberta Immunization Policy (AIP)* for recommendations. • Further testing may be required to determine extent of liver involvement, therefore medical management should be done in consultation with a specialist.

Treatment

- There is no specific treatment for acute cases.
- Treatment of chronic carriers should be done by a responsible physician in consultation with a hepatologist or infectious disease specialist.

Management of Contacts

- Contacts are defined above under key investigation.
- Assess each contact:
  - Determine risk of past infection.
  - Serology may be required to determine status.
  - Recommendations for serology, PEP, and vaccine depend on age, history, and type of contact. See the following tables:
    - Table 4A: Immunization and Serology Recommendations for Management of Contacts at Low Risk of Previous Hepatitis B Infection. *(**Note**: Low risk refers to contacts who are NOT from a hepatitis B endemic country (prevalence ≥8%) and/or do not have other risk factors for acquiring disease)*
    - Table 4B: Immunization and Serology Recommendations for Management of Contacts at High Risk of Previous Hepatitis B Infection. *(**Note:** High risk refers to contacts who are from a hepatitis B endemic country (prevalence ≥8%) and/or have other risk factors for acquiring disease)*
    - Table 5: Post-exposure prophylaxis for infants under 12 months of age.

Post-Exposure Prophylaxis (PEP) for Contacts

- Hepatitis B vaccine is the most important intervention for post-exposure prophylaxis (PEP) and provides 90% protection from hepatitis B.
- HBIG may provide additional protection through immediate short-term passive immunity.
- PEP should be offered to susceptible individuals in the following circumstances:
  - Infant born to a mother who is an acute case or chronic carrier,
  - Sexual or household contacts of an acute case or chronic carrier, and
  - Percutaneous or mucosal exposure to blood or body fluids potentially containing HB virus.[7]
- For management of blood/body fluid exposures (BBFE) in occupational and community settings refer to the Alberta Guidelines for Non-occupational, Occupational and Mandatory Testing and Disclosure Act Post-Exposure Management and Prophylaxis (2015).

Table 4A: Management of Contacts at Low Risk* of Previous Hepatitis B Infection (Immunization and Serology Recommendations)

Immunization Status	Serology Result	Recommendations			
Unimmunized Test for: • anti-HBs • HBsAg	• anti-HBs positive** • HBsAg negative	Offer hepatitis B vaccine series for long-term protection. Post immunization serology not required.			
	• anti-HBs negative • HBsAg negative	• Offer 3 dose vaccine series. • Additionally, offer HBIG to: – sexual contact if within 14 days after last exposure. – non-sexual contact with blood/body fluid exposures if within 7 days after last exposure.		• Post-immunization serology (anti-HBs and HBsAg) at least one month after last dose of vaccine and at least 6 months after if HBIG is given.	
	• anti-HBs negative • HBsAg positive	Determine case/carrier status and follow-up as per guideline.			
Immunized: Documented valid **3** dose series (age appropriate and spaced appropriately) Test for: • anti-HBs • HBsAg	• anti-HBs positive • HBsAg negative	Consider immune No further follow-up required.			
	• anti-HBs negative • HBsAg negative	• Offer one dose of vaccine. • Additionally, offer HBIG to: – sexual contact if within 14 days after last exposure. – non-sexual contact with blood/body fluid exposures if within 7 days after last exposure.	Test anti-HBs and HBsAg. Ensure testing is at least 1 month after the last dose of vaccine and at least 6 months after if HBIG is given.	• anti-HBs positive	Consider immune No further follow-up required
				• anti-HBs negative • HBsAg negative	Complete second series of vaccine. Test 1 month after vaccine series.
				• anti-HBs negative • HBsAg positive	Determine case/carrier status and follow-up as per guideline.
	• anti-HBs negative • HBsAg positive	Determine case/carrier status and follow-up as per guideline.			
Immunized: Documented valid **two** complete vaccine series Test for: • anti-HBs • HBsAg	• anti-HBs positive • HBsAg negative	Consider immune No further follow-up required.			
	• anti-HBs negative • HBsAg negative	Non-responder. No further vaccine indicated	HBIG x 2. Give the 2nd dose of HBIG one month after 1st dose.	Test HBsAg 6 months after HBIG	
	• anti-HBs negative • HBsAg positive	Determine case/carrier status and follow-up as per guideline.			
Immunized: **One or two** doses of 3 dose series Test for: • anti-HBs • HBsAg	• anti-HBs positive • HBsAg negative	Complete hepatitis B vaccine series for long-term protection.			
	• anti-HBs negative • HBsAg negative	• Offer one dose of vaccine. • Additionally, offer HBIG to: – sexual contact if within 14 days after last exposure. – non-sexual contact with blood/body fluid exposures if within 7 days after last exposure.	Test anti-HBs and HBsAg. Ensure testing is at least 1 month after the last dose of vaccine and at least 6 months after if HBIG is given	• anti-HBs positive • HBsAg negative	Consider immune
				• anti-HBs negative • HBsAg negative	Second series of vaccine. Test 1 month after vaccine series
				• anti-HBs negative • HBsAg positive	Determine case/carrier status and follow-up as per guideline.
	• anti-HBs negative • HBsAg positive	Determine case/carrier status and follow-up as per guideline.			

Low risk refers to contacts who are **NOT from a hepatitis B endemic country (prevalence ≥8%) and/or do **NOT** have other risk factors including: multiple sexual partners, MSM, history of injection drug use, and history of blood transfusion prior to 1970.*
*** Anti-HBs positive is ≥10 IU/L; negative is < 10 IU/L*

Table 4B: Management of Contacts at High Risk* of Previous Hepatitis B Infection (Immunization and Serology Recommendations)

Immunization Status	Serology Result	Recommendations			
Unimmunized Test for: • anti-HBs • HBsAg • Anti-HBc	• anti-HBs positive** • HBsAg negative • anti-HBc negative	Consider immune for this exposure. Offer hepatitis B vaccine series for long-term protection. Post immunization serology not required.			
	• anti-HBs negative • HBsAg negative • anti-HBc negative	• Offer 3 dose vaccine series. • Additionally, offer HBIG to: – Sexual contact if within 14 days after last exposure. – Non-sexual contact with blood/body fluid exposures if within 7 days after last exposure.	• Post-immunization serology (anti-HBs and HBsAg) at least one month after last dose of vaccine and at least 6 months after if HBIG is given.		
	• anti-HBs positive • HBsAg negative • anti-HBc positive	• Immune from past infection. • No vaccine indicated.			
	• anti-HBs negative • HBsAg positive • anti-HBc negative	Determine case/carrier status and follow-up as per guideline.			
Immunized: *Documented valid* ***3 dose series*** *(age appropriate and spaced appropriately)* Test for: • anti-HBs • HBsAg • Anti-HBc	• anti-HBs positive • HBsAg negative • anti-HBc negative	Consider immune No further follow-up required.			
	• anti-HBs negative • HBsAg negative • anti-HBc negative	• Offer one dose of vaccine. • Additionally, offer HBIG to: – Sexual contact if within 14 days after last exposure. – Non-sexual contact with blood/body fluid exposures if within 7 days after last exposure.	Test anti-HBs and HBsAg. Ensure testing is at least 1 month after the last dose of vaccine and at least 6 months after if HBIG is given.	• anti-HBs positive	Consider immune No further follow-up required
				• anti-HBs negative • HBsAg negative	Complete second series of vaccine. Test 1 month after vaccine series.
				• anti-HBs negative • HBsAg positive	Determine case/carrier status and follow-up as per guideline.
	• anti-HBs positive • HBsAg negative • anti-HBc positive	Immune from past infection. No additional vaccine indicated.			
	• anti-HBs negative • HBsAg positive • anti-HBc negative	Determine case/carrier status and follow-up as per guideline.			
Immunized: *Documented and valid two complete vaccine series* Test for: • anti-HBs • HBsAg • Anti-HBc	• anti-HBs positive • HBsAg negative • anti-HBc negative	Consider immune No further follow-up required.			
	• anti-HBs negative • HBsAg negative • anti-HBc negative	Non-responder. No further vaccine indicated.	HBIG x 2. Give the 2nd dose of HBIG one month after 1st dose.	Test HBsAg 6 months after HBIG.	
	• anti-HBs positive • HBsAg negative • anti-HBc positive	Immune from past infection. No additional vaccine indicated.			
	• anti-HBs negative • HBsAg positive • anti-HBc negative	Determine case/carrier status and follow-up as per guideline.			
Immunized: *One or two doses of 3 dose series* Test for: • anti-HBs • HBsAg • Anti-HBc	• anti-HBs positive** • HBsAg negative • anti-HBc negative	Consider immune for this exposure. Complete hepatitis B vaccine series for long-term protection. Post immunization serology not required.			
	• anti-HBs negative • HBsAg negative • anti-HBc negative	• Complete vaccine series. • Additionally, offer HBIG to: – Sexual contact if within 14 days after last exposure. – Non-sexual contact with blood/body fluid exposures if within 7 days after last exposure.	Test anti-HBs and HBsAg. Ensure testing is at least 1 month after the last dose of vaccine and at least 6 months after if HBIG is given.	• anti-HBs positive • HBsAg negative	Consider immune
				• anti-HBs negative • HBsAg negative	Second series of vaccine. Test 1 month after vaccine series.
				• anti-HBs negative • HBsAg positive	Determine case/carrier status and follow-up as per guideline.
	• anti-HBs positive • HBsAg negative • anti-HBc positive	• Immune from past infection. • No additional vaccine indicated.			
	• anti-HBs negative • HBsAg positive • anti-HBc negative	Determine case/carrier status and follow-up as per guideline			

** High risk refers to contacts who are from a hepatitis B endemic country with a high prevalence (≥8%) and/or have other risk factors including: multiple sexual partners, MSM, history of injection drug use, and history of blood transfusion prior to 1970.*
***Anti-HBs positive is ≥10 IU/L; negative is < 10 IU/L.*

Table 5: Post-exposure prophylaxis for infants under 12 months of age

Infants born to HBsAg positive mothers (carriers or cases)*	
Prophylaxis	**Indication**
Pre-immunization serology is not required.	
HBIG	• Should be given as soon as possible, preferably within 12 hours of birth • Efficacy decreases significantly after 48 hours but may be given up to 7 days after birth.(4) • The dose for newborns is 0.5 ml intramuscularly.
Hepatitis B vaccine	• Dose is 0.5 ml intramuscularly and should be given at the same time as HBIG, but at different sites. • Subsequent doses to complete series given as per the current *AIP*. • Newborns born to hepatitis B infected mothers who weigh less than 2000 grams at birth should receive an additional dose of vaccine. See *AIP* for spacing.
Follow-up	• Infants born to HBsAg positive mothers should be screened for anti-HBs and HBsAg following completion of hepatitis B vaccine series. Ideally testing should be done at least one month following vaccine and within 6 months of completion of series. However, post-exposure immunization serology testing for this group is recommended **after 9 months of age** so as to avoid detection of passive anti-HBs from HBIG administered at birth and to maximize the likelihood of detecting late HB virus infection.(4)
Infants less than 12 months of age whose mother or primary caregiver is an acute case	
Prophylaxis	**Indication**
Pre-immunization serology is not required.	
HBIG	• HBIG should be offered as soon as possible and within 7 days of last contact if the mother or primary care giver is an acute case or if the mother is a chronic carrier. • HBIG is NOT offered if the primary caregiver is a chronic carrier.
Hepatitis B vaccine	• Dose is 0.5 ml intramuscularly and should be given at the same time as HBIG, but at different sites. • Subsequent doses to complete series given as per the current *AIP*.
Follow-up	• Infants should be screened for anti-HBs and HBsAg following completion of hepatitis B vaccine series. Ideally testing should be done at least one month following vaccine and at least 6 months after HBIG.
Infants less than 12 months of age whose primary caregiver is a chronic carrier	
Prophylaxis	**Indication**
Pre-immunization serology is not required.	
HBIG	• HBIG is not offered if the primary caregiver is a chronic carrier.
Hepatitis B vaccine	• Dose is 0.5 ml intramuscularly. • Subsequent doses to complete series given as per the current *AIP*.
Follow-up	• Infants should be screened for anti-HBs and HBsAg following completion of hepatitis B vaccine series. Ideally testing should be done at least 1-6 months following vaccine.

***NOTE:** All pregnant women should be routinely tested for HBsAg. If maternal testing has not been done during pregnancy, it should be conducted urgently at the time of delivery. Consider administering hepatitis B vaccine, if maternal HBsAg status is unavailable within 12 hours of delivery. HBIG should be given if it is highly suspected that mother could be an acute case or chronic carrier and/or has risk factors for HBV.*

Preventive Measures

- Hepatitis B containing vaccine is 95–100% effective in preventing chronic HBV infection for at least 30 years following immunization and should be offered to susceptible individuals with high risk factors for infection. Refer to the current AIP for vaccine eligibility and vaccine type.
- Post immunization testing is recommended for certain individuals (e.g. infants born to HBsAg positive mothers) if it is important to determine protection against a continual known or repeated potential exposure to HBV. Refer to the current AIP for recommendations.
- Prevent perinatal HBV by:
  - screening all pregnant women,
  - ensuring referral to hepatologist or infectious disease physician during pregnancy for assessment and possible intervention for all HBsAg positive women, and
  - provide timely immunoprophylaxis to infants born to HBsAg positive mothers.
- Routinely screen the following:
  - adopted children from countries or family situations in which there is a high prevalence of HBV,
  - individuals with multiple sexual partners or with a current/past history of STI,
  - individuals infected with another blood-borne infection, and
  - current/past history of IDU.
- Blood, fluids, organs, tissues and contaminated articles from a person infected with hepatitis B shall be disposed of so as to cause no risk to other persons.
- Adequate cleaning and sterilization of re-usable instruments used in invasive procedures including personal care services (e.g., ear/body piercing, tattooing) is recommended.

Health Care Workers

- A HCW with acute/chronic hepatitis B who is uncertain about the potential transmission risks of HBV or proper practices to minimize the risk to clients, should consult with employee health or an infection control practitioner or a patient safety group responsible for the quality of care for the clients.
- A HCW with acute/chronic hepatitis B should be assessed by the Zone MOH for potential risks of transmission to clients. Upon assessment by the Zone MOH, a HCW may or may not be referred to the Alberta Expert Review Panel for Blood Borne Viral Infections in Health Care Workers for further assessment and recommendations, if indicated.
- The Panel is established to review circumstances of HCWs who are found to have a blood borne viral infectious disease. The panel may receive referrals from MOHs regarding HCWs who perform exposure-prone procedures when there is uncertainty as to whether continued or modified professional practice is indicated.
- In certain situations HCWs may be required to contact and report their HBV status to their regulatory body therefore it is recommended that HCWs contact their regulatory body for further recommendation.

References

1. American Academy of Pediatrics. Hepatitis B. In: Kimberlin DW, Brady MT, Jackson MA LS, editor. Red Book: Report of the Committee on Infectious Diseases. Elk Grove Village, IL: American Academy of Pediatrics; 2015. p. 400–23.

2. American Academy of Pediatrics. Control of Communicable Diseases Manual. 20th ed. Heymann DL, editor. Washington, DC: American Public Health Association; 2018.

3. Centers for Disease Control and Prevention (CDC). Chapter 4: Hepatitis B. In: Manual for the surveillance of vaccine-preventable diseases [Internet]. Atlanta, G.A.; 2017. Available from: www.cdc.gov/vaccines/pubs/surv-manual/chpt04-hepb.html

4. Government of Canada. Part 4 - Active Vaccines: Hepatitis B Vaccine [Internet]. Canadian Immunization Guide. 2017. Available from: www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-4-active-vaccines/page-7-hepatitis-b-vaccine.html

5. Thio, C.L.; Hawkins C. Hepatitis B virus and Hepatitis Delta Virus. In: Mandell GL, Bennett JE DR, editor. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 7th ed. Philadelphia, PA; 2015. p. 1815–39.

6. Alberta Health. Communicable Disease Reporting System (CDRS). Edmonton, AB; 2018.

7. Alberta Health. Alberta Immunization Policy [Internet]. 2017. Available from: www.health.alberta.ca/professionals/immunization-policy.html

8. Alberta Health. Notifiable Disease Incidence in Alberta from 1919-2014 [Internet]. 2015. Available from: open.alberta.ca/publications/9781460125618

9. Centers for Disease Control and Prevention (CDC). Hepatitis B. In: Hamborsky J, Kroger A WS, editor. Pink Book: Epidemiology and Prevention of Vaccine-Preventable Diseases [Internet]. Washington, D.C.: Public Health Foundation; 2015. Available from: www.cdc.gov/vaccines/pubs/pinkbook/hepb.html

10. Curry MP, Chopra S. Acute Viral Hepatitis. In: Mandell GL, Bennett JE, Dolin R, editors. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. Philadelphia, PA: Churchill Livingstone Elsevier; 2010. p. 1577–92.