



TABLE OF CONTENTS

1.0 GOAL 1

2.0 CLINICAL DESCRIPTION 1

3.0 EPIDEMIOLOGY 2

4.0 LABORATORY INFORMATION 2

5.0 DEFINITIONS 2

6.0 CASE MANAGEMENT 5

7.0 CONTACT MANAGEMENT 5

8.0 HEPATITIS B POST- EXPOSURE MANAGEMENT 6

TABLE 1: HEPATITIS B POST- EXPOSURE PROPHYLAXIS 7

TABLE 2: HEPATITIS B IMMUNE GLOBULIN 8

HEPATITIS B IMMUNE GLOBULIN (HBIG) (BAYHEP B™) 8

9.0 HEALTH TEACHING TO PREVENT TRANSMISSION OF HBV 9

10.0 VACCINE INDICATIONS 9

11.0 SEROLOGIC TESTING FOR HEPATITIS B IN SPECIFIC GROUPS 10

12.0 BOOSTER DOSES AND RE-IMMUNIZATION 12

13.0 RECORDING 13

14.0 INTERPRETATION OF TESTING RESULTS 14

15.0 HEPATITIS B GUIDELINES FOR PATIENTS WITH CHRONIC KIDNEY DISEASE 15

16.0 ISOLATED HEPATITIS B CORE ANTIBODY POSITIVE TEST RESULTS (HBSAG NEGATIVE,
ANTI-HBC POSITIVE, ANTI-HBS NEGATIVE) 16

ALGORITHM FOR MANAGEMENT OF ISOLATED HEPATITIS B CORE ANTIBODY 17

ALGORITHM FOR MANAGEMENT OF HEPATITIS B CORE ANTIBODY WITH INDETERMINATE ANTI-
HBS 17

ALGORITHM FOR MANAGEMENT OF HEPATITIS B CORE ANTIBODY WITH INDETERMINATE ANTI-
HBS 18

17.0 AUTHORITY 19

18.0 REFERENCES 19



1.0 GOAL

To reduce the annual incidence of hepatitis B virus infection reported in British Columbia by offering:

- A universal infant hepatitis B immunization program
- Immunization of all susceptible Grade 6 students
- Immunization of all individuals who are at high risk of becoming infected with HBV
- Immunization of close, non-immune contacts of persons who are acutely or chronically infected with hepatitis B virus (HBV).
- Universal screening of all pregnant women for HBsAg, and screening for Hepatitis Be antigen for women who are HBsAg positive.
- Follow-up of infants born to mothers who are hepatitis B chronic carriers, to ensure immunized infants are protected, and to identify infants that are infected with HBV.
- Assessment of the risk of infection for persons potentially exposed to HBV, and provision of post-exposure immunoprophylaxis as indicated
- Counselling for infected persons and their contacts

2.0 CLINICAL DESCRIPTION

Hepatitis B virus (HBV) infection is transmitted through exposure to infectious blood and body fluids. It is most commonly acquired through sexual contact, injection drug use, and perinatal exposure from mother to infant. The onset of clinical illness is usually insidious, with anorexia, vague abdominal discomfort, nausea and vomiting, sometimes arthralgias and rash, and progression to jaundice. Fever may be absent or mild. Only a small proportion of acute hepatitis B virus (HBV) infections may be clinically recognized; less than 10% of children and 30–50% of adults with acute HBV infection show icteric disease. Severity ranges from inapparent cases detectable only by liver function tests to fulminating, fatal cases of acute hepatic necrosis. The case fatality rate is about 1%.



3.0 EPIDEMIOLOGY

Prior to the implementation of hepatitis B vaccine programs in BC, the reported acute hepatitis rate in the province was > 5 per 100,000 population, well above the Canadian average. Since the 1992 introduction of a grade 6 hepatitis B immunization program, and the addition of a universal infant program in 2001, the incidence of acute HBV in BC has decreased to < 1 per 100,000, and since 2002 has been consistently below the national average. In 2008, there were 29 cases of acute hepatitis B reported in BC, with no cases reported in individuals under 25 years of age.

4.0 LABORATORY INFORMATION

HBV serology is done in private and hospital laboratories as well as at the BCCDC Public Health Microbiology & Reference Laboratory. Serum is to be sent to BCCDC Public Health Microbiology & Reference Laboratory from outside laboratories for confirmatory testing and to identify false positive results. Outside laboratories have been requested to state “provisional reactive” on any results sent to physicians and health authorities prior to confirmatory testing.

Private BC laboratories are also testing prenatal sera for HBsAg. Results that are sent directly to the ordering physician and to public health may not identify that this was prenatal testing. The laboratory is expected to send positive results to the BCCDC Public Health Microbiology & Reference Laboratory after the initial testing. This is needed for follow-up testing (confirmation and HBeAg testing to inform risk counselling) and communication of results to the referring physician, the hospital of delivery and public health. HBeAg is a measure of infectivity, to be done when the HBsAg test result is positive.

BCCDC receives notification of positive hepatitis B test results from insurance companies that use out-of-province physicians and /or laboratories for client assessment. Health Authorities should be aware that the client’s primary care provider in BC does not usually receive the test results, and the client may also be unaware of the results, as the appropriate follow-up counselling is usually not done.

5.0 DEFINITIONS

5.1 Acute hepatitis B infection:

Confirmed case: Hepatitis B surface antigen (HBsAg) and immunoglobulin M antibody to hepatitis B core antigen (anti- HBc IgM) positive in the context of a compatible clinical history¹ or probable exposure

¹Acute clinical illness is characterized by a discrete onset of symptoms and jaundice or elevated serum aminotransferase levels



OR

Clearance of HBsAg in a person who was documented to be HBsAg positive within the last six months in the context of a compatible clinical history¹ or probable exposure.

Probable case: Acute clinical illness¹ in a person who is epidemiologically linked to a confirmed case

5.2 Chronic hepatitis B infection:

Confirmed case:

HBsAg positive for more than 6 months

OR

Detection of HBsAg and anti-HBc IgG in the documented absence of anti-HBc IgM.

5.3 Hepatitis B infection of undetermined status:

HBsAg positive **AND** does not fit the criteria for either an acute case or a chronic infection.

Note:

- Even with positive HBsAg and anti-HBc IgM results, a compatible clinical history or probable exposure is necessary, because clients with chronic HBV infection may have a reactivation of disease activity and a corresponding rise in anti-HBc IgM. A recent review of a sample of anti-HBc IgM results found > 20% of positive results were likely due to reactivation of chronic infection².
- When a client who is an immigrant from an HBV endemic country presents with a positive HBsAg and has no recent history of acute symptoms, the likelihood is high that this individual is a chronic carrier. Enter in iPHIS as such, and complete the country of origin and date of immigration fields.

¹Acute clinical illness is characterized by a discrete onset of symptoms and jaundice or elevated serum aminotransferase levels

²BCCDC EHSSS Site Field Report 2008 on BCCDC web site
http://www.bccdc.ca/NR/rdonlyres/B5416770-25AF-4FAB-A392-F7CCA7471635/0/Hep_EHSSS_Report_08.ppt



5.4 Contact:

A contact is defined as an individual who has had exposure to potentially infectious blood or body fluids of an HBV infected person. The incubation period for hepatitis B is 45 to 160 days, with an average of 90 days.

Blood contains the highest HBV titre of all bodily fluids and is the most important vehicle for transmission of infection. Semen and vaginal fluids have been implicated in sexual transmission. The following are considered potentially infectious: cerebrospinal, synovial, pleural, peritoneal, pericardial and amniotic fluids, and saliva. Feces, nasal secretions, sputum, sweat, tears, urine and vomitus are not considered infectious unless they contain blood. The risk of transmission from these fluids/materials is extremely low

5.5 Percutaneous Exposure:

Contact through the skin with blood of an HBV infected person, for example, through needlestick or other sharps injury, tattooing, body piercing, electrolysis, or acupuncture.

Non-intact skin exposure: blood or body fluid comes into contact with a wound < 3 days old, or with skin having compromised integrity (e.g., dermatitis, abrasions, fresh cutaneous scratches, burns or other lesions).

For human bites, the clinical evaluation of risk must include the possibility that the person bitten and the person who inflicted the bite were exposed to bloodborne pathogens (i.e., there is blood in the mouth of the biter or in the wound of the person bitten).

5.6 Mucosal exposure:

Contact of the mucous membrane lining body cavities of eyes, nose, mouth, vagina, rectum or urethra with blood or body fluid of an HBV infected person.

5.7 Perinatal exposure:

Infection of an infant at birth from an HBV infected mother. The likelihood of transmission of infection to the infant increases when the HBsAg positive mother is also hepatitis Be antigen positive.



6.0 CASE MANAGEMENT

Confirm the diagnosis with the attending physician before contacting the client.

For clients with a clinical presentation of hepatitis infection in the absence of available laboratory confirmation, discuss follow up with the Medical Health Officer (MHO) or delegate.

Initiate a report in the Communicable Disease Surveillance System (CDSS) module of iPHIS.

For an acute infection, obtain a history of risk factors/potential exposure for the six month period preceding serological diagnosis. Complete the Hepatitis B Enhanced Surveillance Report and submit to BCCDC Hepatitis Services. The form is available at <http://www.bccdc.ca/dis-cond/a-z/h/HepatitisB/guideform/default.htm>

If risk factors indicate the possibility of a transfusion transmissible infection, (where client has been donor or recipient) follow the reporting process in the Transfusion Transmissible Infections chapter of the Communicable Disease Control Manual available at <http://www.bccdc.ca/dis-cond/comm-manual/CDManualChap1.htm>

Arrange for a person with acute infection to be retested at six months, to determine if they have become a chronic carrier. Report in iPHIS as chronic hepatitis B if this occurs, while maintaining the previous report of the acute infection. All persons who are HBsAg positive are potentially infectious. The infectivity of chronically infected individuals varies from high (HBeAg positive) to modest (anti-HBe positive.)

7.0 CONTACT MANAGEMENT

Identify case contacts in the 6 months prior to onset of symptoms. The incubation period for hepatitis B is 45 to 160 days, with an average of 90 days.

Initiate appropriate immunoprophylaxis of contacts. Ascertain hepatitis B vaccination status and/or whether anti-HBs level has been previously determined. Refer to [Table 1: Post-Exposure Prophylaxis](#) and [Table 2: Hepatitis B Immune Globulin](#)

Co-ordinate provision of hepatitis B vaccine and HBIG as required to all contacts.

Counsel case and contacts about minimizing further transmission of hepatitis B virus. Refer to section **9.0** entitled “**Health Teaching to Prevent Transmission of HBV.**”



Note: When the client is a newly identified chronic carrier, and there is no determination of when acute infection occurred, identify contacts in the six months prior to chronic status being known.

8.0 HEPATITIS B POST- EXPOSURE MANAGEMENT

Distribution of HBIg is the responsibility of Canadian Blood Services. HBIg is available through hospital Blood Banks.

If an individual or a physician informs the health unit of percutaneous or mucosal exposure and needs to obtain HBIg and/or hepatitis B vaccine, the following steps are recommended:

- Obtain details of exposure
- Determine testing requirements (see Table 1) and eligibility for HBIg and hepatitis B vaccine. Ask exposed person's physician to arrange testing of exposed person's/source's blood as indicated. Refer to the guidelines for Blood and Body Fluid Exposure Management available at <http://www.bccdc.ca/dis-cond/comm-manual/CDManualChap1.htm>. Use the Hlth 2339 and Hlth 2340 forms for testing and follow-up.
- When HBIg is indicated, contact the supervisor of the Blood Bank at the nearest hospital. Arrange with the physician and the exposed person for the provision and administration of HBIg and/or hepatitis B vaccine.
- Give HBIg as soon as possible, preferably within 48 hours of the exposure (percutaneous, permucosal or sexual.)
- For percutaneous exposure, HBIg may be given up to 7 days following the exposure. If the client presents > 7 days following a percutaneous exposure, give Hepatitis B vaccine only.
- For permucosal or sexual exposures, HBIg may be given up to 14 days following the last exposure. If a client presents > 14 days following a permucosal or sexual exposure, give hepatitis B vaccine only.



TABLE 1: HEPATITIS B POST- EXPOSURE PROPHYLAXIS

Note: this table does not apply to immunocompromised persons; this group requires consultation with a physician specializing in infectious diseases.

Vaccination history of exposed person	Test exposed person for: HBsAg, anti-HBc & anti-HBs.	If source is HBsAg positive or tests positive within 48 hrs of exposure ^②	If source is unknown/not tested/tests HBsAg negative within 48 hours of exposure ^②	Post-exposure re-testing
Documented anti-HBs level (≥ 10 IU/L) on prior testing	Test for all three markers for medical-legal purposes	No action required.	No action required.	No action required.
Unvaccinated or Known non-responder ^① to one course of Hep B vaccine	Test for all 3 markers Test for all 3 markers	Give Hepatitis B Immune Globulin (HBIG) ^③ and Hepatitis B vaccine series ^④	Give Hep B vaccine series Give 2 nd Hep B vaccine series	Re-test for all 3 markers at 6 & 9 months ^⑤
Received 1 dose of Hep B vaccine, anti-HBs status unknown	Test for all 3 markers	Give HBIG & complete Hep B vaccine series.	Complete Hep B vaccine series.	Re-test for all 3 markers at 6 & 9 months ^⑤
Received 2 doses of a 3 dose series of Hep B vaccine, anti-HBs status unknown	Test for all 3 markers. If anti-HBs is < 10 IU/L, then→	Give HBIG & 3rd dose of Hep B vaccine. Repeat 3 rd dose if given too early in series.	Give 1 dose of Hep B vaccine & retest for anti-HBs in 4 wks; if < 10 IU/L repeat series.	Re-test for all 3 markers at 6 & 9 months ^⑤
	Test for all 3 markers. If anti-HBs is ≥ 10 IU/L, then→	Do not give HBIG. Complete Hep B vaccine series.	Do not give HBIG. Complete Hep B vaccine series.	No re-testing required.
Complete Hep B vaccination (2 or 3 dose series) and anti-HBs status unknown	Test for all 3 markers. If anti-HBs is < 10 IU/L, then→	Give HBIG and 1 dose of vaccine.	1 dose Hep B vaccine & retest for anti-HBs in 4wks; if < 10 IU/L complete second series.	Re-test for all 3 markers at 6 & 9 months ^⑤
Known non-responder ^① after two courses of Hep B vaccine	Test for HBsAg & anti-HBc. Do not test for anti-HBs.	Give HBIG only & give another dose of HBIG in 1 mo.	No action required.	Re-test for all three markers at 6 & 9 months.

- ^① A non-responder to a series of Hepatitis B vaccine is someone who demonstrates an anti-HBs level of < 10 UI/L, when measured 1 to 6 months post-vaccination.
- ^② Consensual adult sex with known STW or IDU is not an indication for HBIG, nor is a community acquired needlestick injury: the risk of transmission is low and the number needed to treat to prevent infection is extremely high. HBIG is indicated in the case of sexual assault or if one of the individuals is known to have acute or chronic hepatitis B infection.
- ^③ HBIG dose for all clients ≥ 8.3 kg is 0.06ml/kg. Give HBIG as soon as possible, preferably within 48 hours of exposure. For a percutaneous exposure, give HBIG up to 7 days following the exposure. If the client presents > 7 days following a percutaneous exposure, give Hepatitis B vaccine only. For permucosal or sexual exposures, HBIG may be given up to 14 days following the last exposure. If the client presents > 14 days following a permucosal or sexual exposure, give Hepatitis B vaccine only.
- ^④ Hepatitis B vaccine schedule is 0, 1 and 6 months for post-exposure prophylaxis.
- ^⑤ A second series of Hepatitis B vaccine should be offered to non-responders.

**TABLE 2: HEPATITIS B IMMUNE GLOBULIN**

HEPATITIS B IMMUNE GLOBULIN (HBIG) (BAYHEP B™) SUPPLIER: BAYER	
INDICATIONS	DOSAGE^①
1. Infant born to known HBsAg positive woman	1. Give HBIG 0.5 ml IM immediately after birth , along with first dose of hepatitis B vaccine series ^②
2. Infant born to woman at high risk for hepatitis B infection (i.e. intravenous drug use, sex trade work) whose infectious status is unknown or negative (possible window period)	2. Give HBIG 0.5 ml IM immediately after birth , along with first dose of hepatitis B vaccine series ^②
3. Infant < 12 months of age has mother with acute hepatitis B infection	3. Considering the immune status of the infant and history of hepatitis B immunization and give HBIG 0.06 ml/kg of body weight and hepatitis B vaccine as required, ^{② ③ ④}
4. Percutaneous or mucosal exposure to HBsAg positive source.	4. Give HBIG 0.06 ml/kg of body weight and hepatitis B vaccine as required, considering the client's immune status and history of hepatitis B immunization. ^{③ ④}
5. Sex with a person who has acute or chronic hepatitis B infection	5. Give HBIG 0.06 ml/kg of body weight as soon as possible following the last sexual exposure, along with hepatitis B vaccine series ^{③ ④ ⑤}
REINFORCEMENTS	An at-risk known non-responder to two series of vaccine requires 2 doses of HBIG one month apart
CONTRAINDICATIONS	None

- ① There is no upper limit to the volume of HBIG that can be administered.
- ② There is **no** outer time limit for administering HBIG in infants <12 month's of age, when the infant's exposure to the known risk factor(s) is ongoing. For infants < 8.3 kg, give 0.5 ml HBIG.
- ③ HBIG dose for all clients ≥ 8.3kg is 0.06ml/kg. Give HBIG as soon as possible, preferably within 48 hours of exposure. For a percutaneous exposure, give HBIG up to 7 days following the exposure. If the client presents > 7 days following a percutaneous exposure, give Hepatitis B vaccine only. For permucosal or sexual exposures, HBIG may be given up to 14 days following the last exposure. If the client presents >14 days following a permucosal or sexual exposure, give Hepatitis B vaccine only. Refer to Hepatitis B Post-Exposure Prophylaxis table.
- ④ See Immune Globulin Preparations (HBIG,Ig,Varlg,Rablg) for maximum volume to be administered per site according to age.
- ⑤ For **steady, long term** sexual partners of chronic hepatitis B carriers, test for HBsAg, anti-HBc and anti-HBs to determine if client is susceptible and requires HBIG, or has been infected previously.

See BC Communicable Disease Control Manual, Chapter 2, [Section VII. Biological Products](#), for HBIG Precautions and Adverse Events.



9.0 HEALTH TEACHING TO PREVENT TRANSMISSION OF HBV

Advise those infected with HBV to reduce transmission of infection to others by:

- Not donating blood, semen, breastmilk, body organs or tissues;
- Not sharing toothbrushes, dental floss, razors, earrings, or manicure equipment (articles that might have traces of blood);
- Keeping all open cuts and sores bandaged until healed;
- Informing sexual partner(s) that they are infected with HBV. Advise sexual partners of the availability of hepatitis B vaccine. Protection from infection cannot be ensured until the vaccine series has been completed and a protective anti-HBs level demonstrated through testing. Use of latex condoms will reduce the risk of HBV transmission;
- Putting articles with blood on them (e.g., tampons, pads, Kleenex, dental floss and bandages) in a separate plastic bag before disposing into household garbage;
- Disposing of bloody sharp items (razor blades, needles, etc) into a hard container, taped shut;
- Using bleach to clean up blood spills. Wet surfaces with 1 part bleach to 9 parts water and leave sitting for 10 minutes before wiping off;
- Not sharing drug snorting or smoking equipment such as straws or pipes, or injection equipment such as cookers, cotton, filters, water, syringes and needles;
- Avoiding pregnancy until HBsAg negative or identified as a chronic carrier;
- Advising their doctor, dentist, and anyone who might come into contact with their blood (such as those who do electrolysis, acupuncture, body piercing, and tattooing) that they are infected with HBV.

10.0 VACCINE INDICATIONS

Refer to the BC Communicable Disease Control Manual, Chapter 2, Immunization Program, Section VII, Biological products, available at <http://www.bccdc.ca/dis-cond/comm-manual/CDManualChap2.htm> for the pre- and post-exposure indications for individuals eligible for publicly-funded Hepatitis B vaccine.

Infants:

- An infant born to a mother who is HBsAg positive, or to a mother who is at high risk of hepatitis B infection (intravenous drug use {IDU} or sex trade worker {STW}) and whose infectious status is unknown or negative (possible window period) requires both HBIG and a dose of hepatitis B vaccine at birth.



HBIG should be given immediately after birth. To complete the hepatitis B vaccine series, these infants will receive INFANRIX hexa™ at 2, 4 and 6 months of age.

- An infant born to a mother who has risk factors (other than IDU and STW) for hepatitis B infection and whose infectious status is unknown or negative (possible window period) requires hepatitis B vaccine at birth. An infant whose father or primary caregiver or other household contact has chronic hepatitis B infection requires hepatitis B vaccine at birth. These infants who receive a birth dose of hepatitis B vaccine will complete the hepatitis B vaccine series with INFANRIX hexa™ at 2, 4 and 6 months of age.
- Any infant who weighs less than 2000 grams at birth and who requires a birth dose of hepatitis B vaccine, with or without HBIG, will complete the hepatitis B vaccine series with INFANRIX hexa™ at 2, 4 and 6 months of age.
- Infants who receive hepatitis B vaccine at birth, with or without HBIG, and who have received a dose of hepatitis B vaccine at 1 month of age will receive Pediacel® at 2, 4 and 6 months of age and a 3rd dose of hepatitis B vaccine at 6 months of age. These infants weighing < 2000 grams at birth will require a 4th dose of Hepatitis B vaccine at 8 months of age.

11.0 SEROLOGIC TESTING FOR HEPATITIS B IN SPECIFIC GROUPS

11.1 Pregnancy:

All pregnant women should be routinely tested for HBsAg at the first prenatal visit. If testing has not been done during pregnancy, it should be done at the time of delivery. Repeat testing prior to delivery may be considered for women with ongoing high-risk behaviour. See BC Communicable Disease Control Manual, [Chapter 2, Immunization program, Section III, Immunization of Special Populations](#), for additional information.

11.2 Internationally Adopted Children:

Many internationally adopted children come from hepatitis B endemic countries. Offer hepatitis B vaccine to adoptive family members prior to the arrival of the adopted child. Screen the child for HBsAg, Anti-HBs, and anti-HBc. Consider repeating these tests six months later (since the virus can have a long incubation period.)



11.3 Pre-vaccination Testing:

Testing for HBsAg, anti-HBc and anti-HBs is recommended for the following:

- Persons at high risk of having been infected (i.e., IDU, STW, sexual partners of HBV infected individuals and persons born in a country of high hepatitis B prevalence). Testing will identify those already infected or immune, for whom vaccine will confer no benefit, and assist in the medical management and contact follow-up of those individuals found to be infected.
- Individuals with chronic HCV or other chronic liver diseases
- Students entering health care professions who have been previously vaccinated, but their response to initial vaccination is unknown.

11.4 Post-vaccination testing:

Testing HBsAg, anti-HBs, and anti-HBc, when indicated, is done 1 month (and no longer than 6 months) after completion of the vaccine series.

Post vaccination testing is indicated for:

- Infants born to known HBsAg positive mother^❶ Test HBsAg and anti-HBs only. Anti-HBc testing post-vaccination is no longer indicate for these infants.
- Infants with a mother, father, or primary caregiver at high risk for hepatitis B infection (e.g., intravenous drug use, sex trade worker) ^❶. Test HBsAg and anti-HBs only.
- Sexual partners of persons with acute or chronic hepatitis B infection
- Household contacts of persons with acute or chronic hepatitis B infection
- Individuals who have had a percutaneous or mucosal exposure to hepatitis B
- Immunocompromised individuals who may be expected to have a lower seroconversion rate (e.g., chronic kidney disease clients^❷, HIV, HSCT and solid organ transplant recipients, and chronic HCV clients with cirrhosis^❸)
- Students in health care professions
- Health care workers^❹

❶ Accountability mechanisms should be in place to ensure that every infant born to a hepatitis B infected mother receive HBIG and a full course of



vaccine, as well as testing for serologic response to vaccine. Infants who receive only hepatitis B vaccine at birth should also be tested following completion of the vaccine series.

- ② See [Hepatitis B Guidelines for Patients with Chronic Kidney Disease](#).
- ③ A literature review found studies that showed that HBV vaccine appeared to be as effective in chronic HCV populations as in controls; however, response was generally reduced in those clients with cirrhosis.
- ④ It is the responsibility of the employer (through Occupation Health program) to implement testing and vaccination programs for health care workers. Those who fail to respond to a first series of hepatitis B vaccine should be offered a second series. Determination of inadequate antibody response after a second complete vaccine series will identify those who will need passive protection (i.e., HBIG) after potential exposure to hepatitis B. Health care workers are encouraged to keep a record of immunization and testing results.

12.0 BOOSTER DOSES AND RE-IMMUNIZATION

Routine booster doses in immunocompetent people are not needed, since protection has been shown to last for at least 15 years. While antibody wanes over time, immune memory persists. The absence of detectable anti-HBs in a person who previously demonstrated an adequate level of anti-HBs does not mean lack of protection.

Individuals who received hepatitis B vaccine years prior to enrolment as a student in a health care profession or years prior to employment as a health care worker may be tested to determine protective status for hepatitis B. If anti-HBs is < 10 IU/L but is detectable, provide one dose of vaccine and retest anti-HBs. If level is ≥ 10 following this dose, no further vaccine is required. When anti-HBs is < 10 IU/L after this one dose, complete the second vaccine series and retest.

If initial testing as a health care student or employee (when first vaccine series provided years earlier) indicates **no** detectable antibody, provide a three dose vaccine series and retest following.

Non-responders to 1 course of hepatitis B vaccine (i.e., anti-HBs is < 10 IU/L): An additional three dose series will produce a protective antibody response in 50% to 70% of otherwise healthy people who fail to show a response after the first series. Individuals who fail to respond to the 2nd three-dose vaccination series are unlikely to benefit from further immunization.

A second series of vaccine is provided free **ONLY** to the following:



- Infants born to HBsAg positive mothers
- Infants born to mothers at high risk of hepatitis B infection
- Clients with immunosuppressive disorders
- Dialysis/pre-dialysis clients (see [Hepatitis B Vaccine Program for Chronic Kidney Disease Clients, Immunization Program Manual, Section III](#))
- Health care students and Health care Workers
- Individuals who have had an exposure to hepatitis B virus and require immunoprophylaxis.

13.0 RECORDING

Record cases as Acute, Chronic, or Undetermined (see [5.0 Definitions](#)). It should be possible to limit the number of “undetermined” cases, which are only those cases where there is presence of HBsAg and no other clinical information or laboratory markers.

If a case is recorded as **Acute**, and retested at 6 months and is still HBsAg positive, then enter as an additional case and code as **Chronic**. DO NOT CHANGE THE ORIGINAL ACUTE ENTRY.

If an “undetermined” case is retested at 6 months or later, and if follow-up of the client reveals the evidence of clinical symptoms of hepatitis infection, or if the surface antigen after 6 months is negative **recode** the original case report as **Acute**.

If the surface antigen remains positive after 6 months, and there is no definitive information on the client’s previous disease status, **recode** the original “Undetermined” report as **Chronic**.

Cases who test positive for hepatitis B, who are asymptomatic and have immigrated from an endemic country usually have chronic hepatitis B infection.

If an immigrant client tests positive for hepatitis B and is asymptomatic, code as **Chronic**, and if the information is available:

1. select the Exposure category “Immigration from an Endemic Area” under the Exposure tab, and
2. enter the “Birth Country,” “Country Emigrated From,” and “Country Last Resided” information under Demographics/Immigration and Other.



14.0 INTERPRETATION OF TESTING RESULTS

Factor to be tested	Term	Use
HBsAg	Hepatitis B surface antigen	Detection of acutely or chronically infected person
Anti-HBs	Antibody to HBsAg	Identification of resolved infection with HBV; determination of immunity after hepatitis B vaccination
Anti-HBc	Antibody to core antigen (HBcAg)	Identification of individuals with prior infection with HBV (not present after immunization).
Anti-HBc IgM	IgM class antibody to HBcAg	Indicates acute or recent infection with HBV; detectable for 4-6 months after infection.
HBeAg	Hepatitis B e Antigen	Identification of infected individuals at increased risk of transmitting HBV.
Anti-HBe	Antibody to HBeAg	Identification of infected individuals at lower risk for transmitting HBV.

HBsAg anti-HBc anti-HBs	negative negative negative	susceptible
HBsAg anti-HBc anti-HBs	negative negative positive (≥ 10 IU/L)	immune due to vaccination
HBsAg anti-HBc anti-HBs	negative positive positive (≥ 10 IU/L)	immune due to natural infection
HBsAg anti-HBc IgM anti-HBs	positive positive negative	acute infection
HBsAg anti-HBc anti-HBs	positive positive negative	chronic infection
HBsAg anti-HBc anti-HBs	negative positive negative	“isolated anti-core positive” four interpretations possible



15.0 HEPATITIS B GUIDELINES FOR PATIENTS WITH CHRONIC KIDNEY DISEASE

	HBsAG	Anti_HBs (IU/L)	Total Anti-HBc	Clinic Scenario	Interpretation ^①	Vaccination Protocol
(1)	Negative	< 10	Negative	No prior immunization or incomplete immunization	Susceptible to Hepatitis B	Immunize with primary (3 dose) series. Test 1 month after last dose.
(2)	Negative	≥10	Negative	Results after primary series	Immunity to Hepatitis B	Monitor annually
(3)	Negative	< 10	Negative	Results after primary series	Inadequate response to primary series	Provide second vaccine series. Test anti-HBs 1 month after last dose. If anti-HBs remains < 10, no further immunization. Document as a non-responder. ^②
(4)	Negative	≥10	Negative	Results of annual testing	Immunity to Hepatitis B	Monitor annually
(5)	Negative	1 to < 10	Negative	Results of annual testing	Possibly susceptible to Hepatitis due to falling titres	Give a second vaccine series as in (3) above if client has not had second series. If second series has been given previously, provide a booster dose.
(6)	Negative	< 1	Negative	Results of annual testing	Susceptible to Hepatitis B	Document as a non-responder. ^②

Following initial vaccine or second vaccine series and a protective response (anti-HBs ≥ 10), continue annual testing. Results of annual testing may indicate a need for 1 booster dose, or completion of a second series of vaccine if not received previously. Provide no more than two complete vaccine series. A booster dose may be provided annually as long as the client continues to mount an antibody response (1 to < 10).

① For interpretation of test results that include a positive HBsAg and/or a positive anti-HBc, refer to [14.0 Interpretation of test results](#).

② Test HBsAg annually in non-responders. A non-responder exposed to blood or body fluids and at risk for Hepatitis B infection should be given 2 doses of HBIG, 1 month apart.



16.0 ISOLATED HEPATITIS B CORE ANTIBODY POSITIVE TEST RESULTS (HBSAG NEGATIVE, ANTI-HBC POSITIVE, ANTI-HBS NEGATIVE)

For all cases, consider as infectious to others until further information is available, and counsel accordingly.

Provide hepatitis B vaccine and/or HBIG to contacts as needed. Secondary testing as per algorithms, for anti-HBcIgM, or repeating initial tests can be done on the same sample, if available.

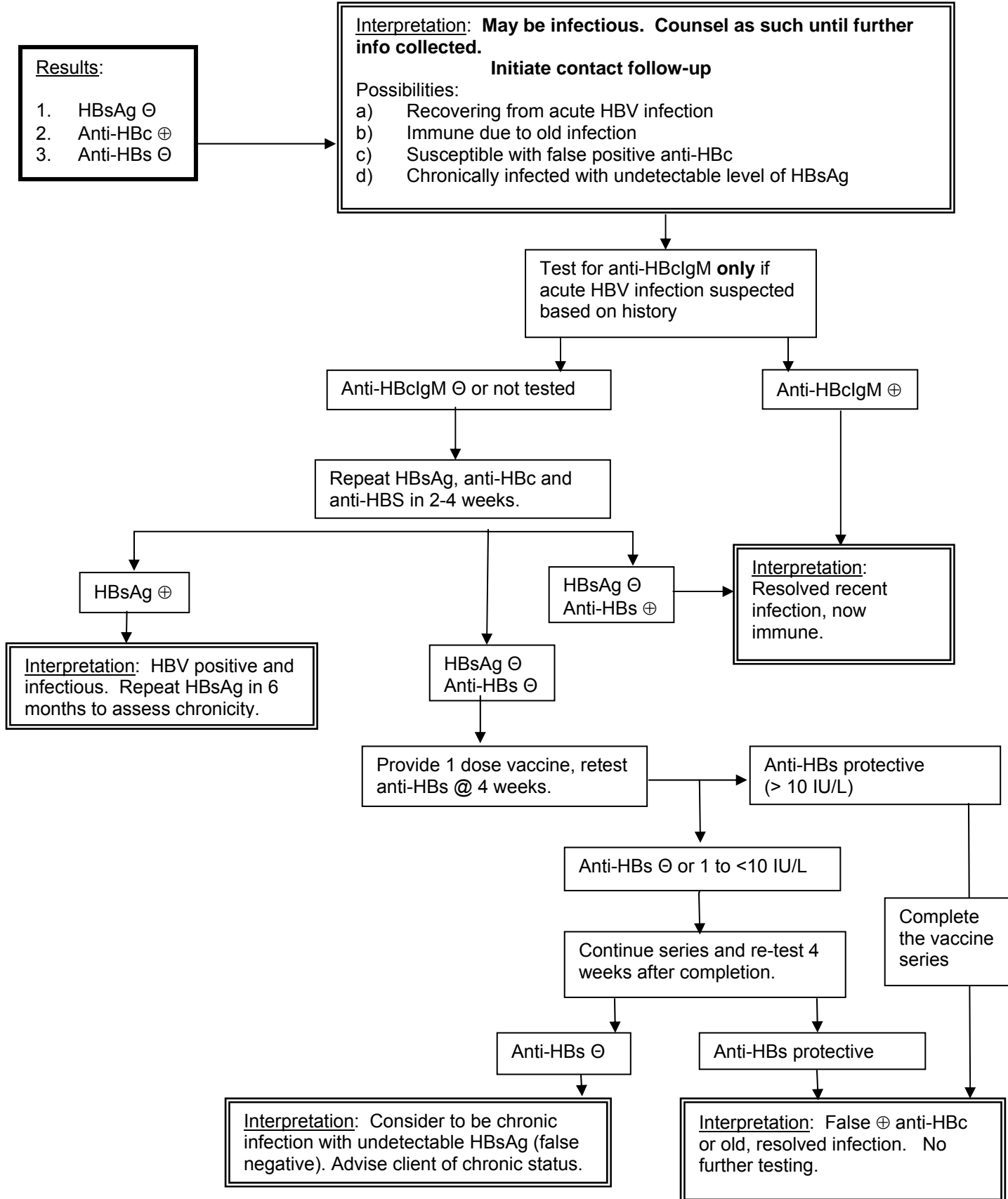
There are four possible interpretations of the “isolated core” result:

- The client is in the “window phase” of an acute infection, between the disappearance of HBsAg and the appearance of anti-HBs. Assess re: clinical symptoms and risk factors for hepatitis B. To determine if this is an acute case, test for anti-HBc IgM only if acute infection is suspected, based on history.
- Results may represent chronic infection with HBsAg that is escaping detection. Consider the client to have a low level of infectivity, and provide hepatitis B vaccine to household and sexual contacts. Provide hepatitis B vaccine to the client to confirm chronic status, as indicated by undetectable anti-HBs at series completion.
- Results may represent a remote resolved infection with the decline of anti-HBs to levels that are undetectable. Individuals with resolved infections and sub-detectable anti-HBs would be expected to exhibit an anamnestic response to hepatitis B vaccine, with protective levels of antibody developing after a single dose of vaccine.
- This may be a false positive test result and the client is susceptible to hepatitis B and is not infectious to others. False positive individuals would be expected to develop detectable anti-HBs on the completion of a three dose series of hepatitis B vaccine.

Note: An isolated core result is found more frequently in individuals with HIV and/or HCV co-infection. Consider anti-HCV and HIV testing when there are risk factors for these infections.

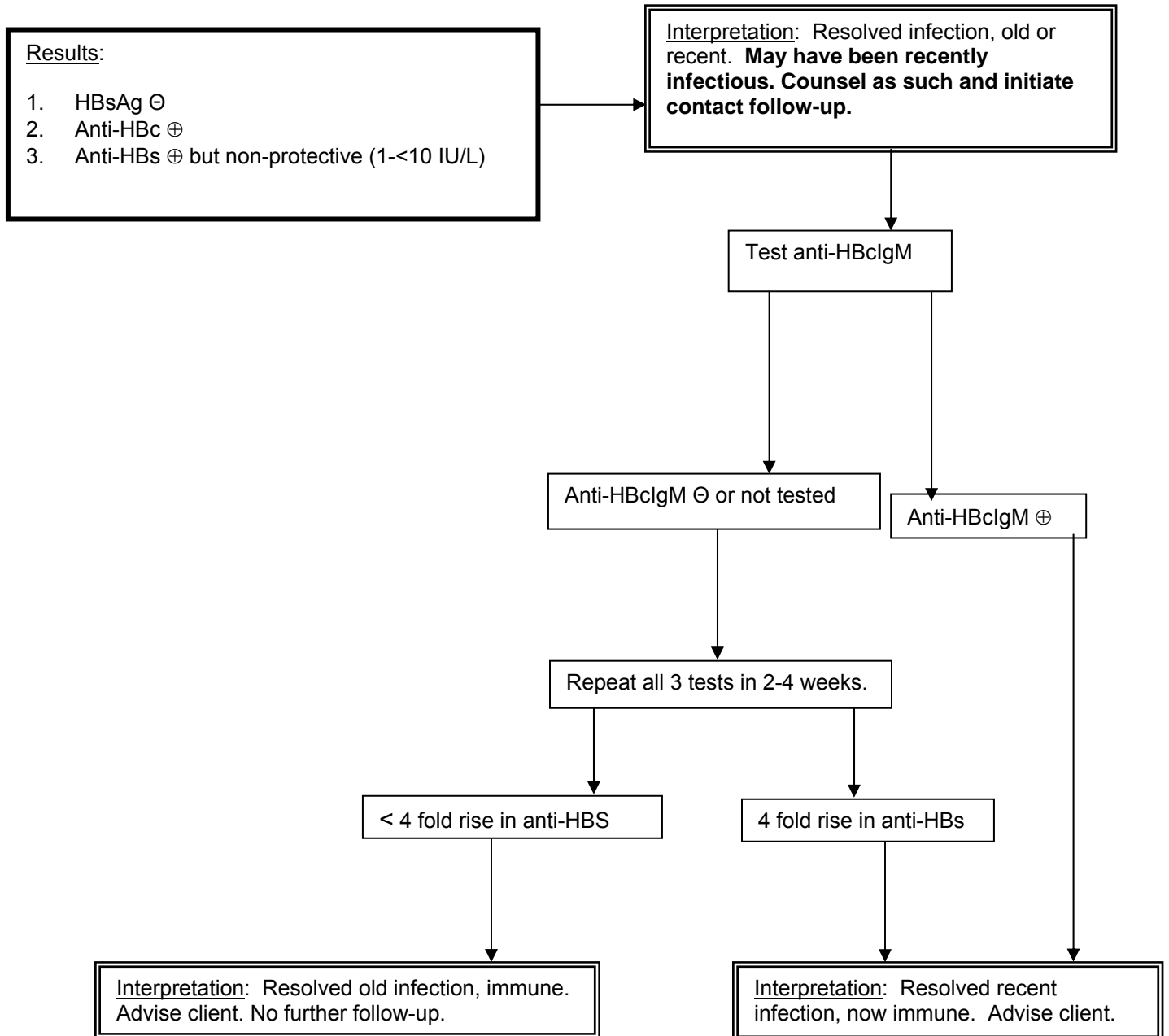


ALGORITHM FOR MANAGEMENT OF ISOLATED HEPATITIS B CORE ANTIBODY





**ALGORITHM FOR MANAGEMENT OF HEPATITIS B CORE ANTIBODY WITH
INDETERMINATE ANTI-HBS**





17.0 AUTHORITY

BC Public Health Act 2008

18.0 REFERENCES

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