

HEPATITIS B

Case definition

ACUTE CASE

CONFIRMED CASE

- Hepatitis B surface antigen (HBsAg) and IgM antibody to hepatitis B core antigen [anti-HBc IgM] positive in the context of a compatible clinical history or probable exposure
- 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 history or probable exposure

PROBABLE CASE

Acute clinical illness in a person who is epidemiologically linked to a confirmed case

CHRONIC CARRIER

Confirmed case

- HBsAg positive for more than 6 months
- **OR**
- Detection of HBsAg in the documented absence of anti-HBc IgM
- **OR**
- Detection of HBV DNA for more than 6 months

*If a new case is from an endemic country ([WHO map of countries and areas of risk for HB](#)) enter the case as Chronic Carrier. Enter all other cases based on case definition. Ensure disease name is updated following the subsequent 6 month lab result.

Causative agent

Hepatitis B virus (HBV), a DNA virus of the Hepadnaviridae family.

Source

Humans.

Incubation

Usually 45 to 180 days, average 60-90 days. As short as 2 weeks to the appearance of HBsAg, and rarely as long as 6-9 months.

Transmission

Hepatitis B is mainly spread through blood and body fluids. Transmission of HBV may also occur with activities involving percutaneous exposure and the use of contaminated equipment.

HBV is stable on environmental surfaces in blood for at least 7 days making indirect transmission from objects contaminated with infected blood possible.

The primary sources of HBV infection include:

- exposure to HBV-contaminated blood by the use of contaminated or inadequately sterilized instruments and needles/equipment, including medical/dental practices
- injection drug use
- tattooing, ear or body piercing, acupuncture, or electrolysis
- practices using unsterilized objects [e.g., scarification, circumcision, etc.]

Other sources of transmission include:

- sharing drug injection, snorting, or smoking equipment, such as needles, syringes, straws, pipes, cookers, wash and filters, etc.
- household exposure through sharing of personal hygiene equipment, such as toothbrushes, razors, nail clippers, etc.
- sexual contact
- vertical transmission [maternal–fetal/infant]

Communicability

- From several weeks before onset of symptoms until infection is resolved
- The presence of HBsAg indicates that the person is infectious
- Chronic infection occurs in:
 - 90% of infants infected at birth
 - 20–50% of children infected at age 1–5 years
 - 1–10% of infected adults
- Carriers [those with chronic infection] may transmit the virus at any time.

Symptoms

Initial infection with HBV may be asymptomatic in up to 50% of adults and 90% of children. Symptoms may include jaundice, malaise, anorexia, nausea, vomiting, myalgia, rash and arthralgia. Fever may be absent or mild. Chronic infections may present with disease flares with similar symptoms and signs.

Diagnostic testing

Blood: anti-HBc IgM, HBsAg testing is required for diagnosing acute/chronic HBV infection. For immunity screening, request testing for anti-HBs only.

Serological Marker	Common Abbreviations	Definition
Hepatitis B Surface Antigen	HBV Surface Ag; HBsAg	HBsAg indicates infection. Persistence of HBsAg for 6 months or more indicates chronic infection. However, up to 50% of people with extended chronic infection will eventually clear HBsAg. By contrast, those with resolving acute HBV will clear HBsAg within several months after initial infection.
Antibody to HBV Surface Antigen	HBV Surface Ab; anti-HBs	Anti-HBs is a protective antibody produced with recovery from infection or in response to immunization. Over time, titre may decline to undetectable levels. NOTE: There is a gap of several weeks to months between the disappearance of HBsAg and the appearance of anti-HBs; during this period, anti-HBc is detectable as a marker of HBV infection.
Antibody to HBV Core Ag	HBV Core Ab; anti-HBc; HBcAb	Anti-HBc (total core antibody–IgM and IgG) is a marker of past exposure or current infection. IgG usually persists for life. In low prevalence populations, a finding of isolated anti-HBc may signify a false positive result.
IgM class antibody to HBcAg	Anti-HBc IgM	Anti-HBc IgM (core antibody–IgM) appears early in acute HBV infection and persists for about 6 months. It may also be seen in chronic infection during flares of activity, so clinical/epidemiological correlation is required for interpretation.
Hepatitis B e-Antigen	HBeAg	HBeAg (e-antigen) is a marker of viral replication; its presence indicates high infectivity.
Antibody to HBeAg	Anti-HBe	Anti-HBe (e-antibody) appears with recovery from acute infection. In chronic infection, the presence of anti-HBe is generally a marker of reduced viral replication, indicating a less infectious state.

HBV Serological Markers				Interpretation
HBV Surface Ag	HBV Surface Ab	HBV Core Ab	Anti-HBc IgM	
Negative	Negative ¹	Negative	N/A	Susceptible; non-immune
Negative	Positive ^{1,2}	Negative	N/A	Immune due to immunization
Negative	Positive ³	Positive	N/A	Immune due to previous infection
Positive ⁴	Negative	Positive	Positive ⁵	Infected-acute infection
Positive	Negative ³	Positive	Negative ⁵	Infected-chronic infection
Negative	Negative	Positive ⁶	Negative	4 possible interpretations ⁶

¹About 5%–10% of people will not respond to the vaccine or else do not produce protective levels of antibody post-vaccination [i.e., titre of ≥ 10 IU/mL].

²Levels of HBV Surface Ab may decline over time and become undetectable. For more information, see [Canadian Immunization Guide](#)

³A small percentage of people with chronic infection will have both HBV Surface Ag and HBV Surface Ab markers present.

⁴HBsAg can be positive for up to 14 days following HBV vaccination.

⁵Since anti-HBc IgM can be detected in acute HBV, this test may be helpful when acute infection is suspected. It may also reappear in a flare of chronic infection.

⁶On rare occasions, an isolated HBV Core Ab will be the only detectable marker. Although there are several possible interpretations for this finding, it is more common in immunocompromised people and in those who are co-infected with HIV or HCV:

- In low prevalence populations this finding is most often a false positive result or due to lab error
 - Repeat test if lab error is suspected

- Less frequently this finding may reflect:
 - Resolving acute infection before the appearance of HBV Surface Ab
 - Natural immunity with undetectable HB Surface Ab due to a decline in antibody titre over time
- Rarely, this finding may represent a chronic infection with undetectable HBV Surface Ag
 - May need to consult a specialist for guidance

Treatment

Supportive for acute hepatitis B. There are some antiviral medications available for the treatment of chronic HBV infection. Consult with a specialist for the latest treatment.

PUBLIC HEALTH MANAGEMENT & RESPONSE

Case management

- Initiate follow-up of the case within 48 hours of receiving the report. All HBsAg+ cases should be followed up unless the person is a documented carrier who has been followed up as a carrier.
- Determine if the case is already known to be hepatitis B positive [refer to the Nova Scotia Surveillance Guidelines for Notifiable Diseases and Conditions at novascotia.ca/dhw/populationhealth/surveillanceguidelines]. If not, continue with the investigation.
- Contact the healthcare provider named on the lab report and inform them of the role of Public Health in hepatitis B follow-up.
- Obtain preliminary information from the reporting healthcare provider. Such information may include:
 - the reason for testing
 - has there been a referral to a specialist
 - is this a first-time diagnosis
 - is the patient aware of diagnosis
- Contact the case and document required case management information, including risk factors and receipt or donation of blood products, cells, tissues, or organs. If blood transfusion and/or donation has been identified, specific information with respect to the dates of transfusion and/or donation, institution, and the case's address at the time of transfusion and/or donation are collected with as much detail as possible.

- Note: If there is a history of blood or blood product donation or receipt, please review with the Medical Officer of Health (MOH) to consider the need for a Look-back or Trace-back as necessary. The Look-Back/Trace-Back protocol can be found in the Surveillance guidelines at novascotia.ca/dhw/populationhealth/surveillanceguidelines
- Discuss potential contacts and determine next steps for contact tracing (see *Contact tracing* section below).
- Consult the MOH if exposure to the virus may have occurred in a facility offering personal services such as manicure/pedicure, tattoo, piercing, or dentistry.
- As needed, discuss with healthcare provider possible referral options to an appropriate specialist for additional testing, investigation, and treatment.
- Refer to NS Vaccine Eligibility for High Risk Conditions policy novascotia.ca/dhw/CDPC/documents/Immunization-Manual.pdf

Ongoing follow-up

Public Health will discuss with the healthcare provider the need to complete follow-up testing in six months to determine if the HBsAg individual becomes a carrier.

Exclusion

- Hepatitis B cases need not be excluded from work, school, play, childcare, or other settings on the basis of their HBV infection status.
- In situations where the person's work involves a high risk of transmission to others, consult with MOH about a plan of action and/or an education plan.
- Consult MOH in situations where recreational activities (e.g., boxing) could involve higher risk of transmission.

Education

Provide advice about how to prevent transmission and offer the following recommendations:

- Do not share personal items, such as toothbrushes, dental floss, razors, earrings, manicure equipment, nail clippers, sexual toys, etc. [i.e., articles that might have traces of blood].
- Do not share drug injection, snorting, or smoking equipment, such as needles, syringes, straws and pipes, cookers, wash, filters, etc.
- Do not share needles and ink used for tattooing, and do not share needles used for body piercing and/or body modifications unless properly cleaned and sterilized.
- Do not donate blood, semen, tissue, organs, or breast milk.
- Prevent blood and other potentially infective body fluids from coming into contact with other individuals. Cover open wounds and cuts until healed.

- Put articles with blood on them (e.g., tampons, pads, tissue, dental floss, and bandages) in a separate, sealed plastic bag before disposing of them in household garbage.
- Clean blood spills appropriately. Use gloves, soak up the blood with paper towels and dispose of them in a sealed plastic bag, clean the surface with detergent and water, and then disinfect the surface with a fresh solution of 1 part bleach (100 mL) to 9 parts water (900 mL). Allow this to stay on the surface for 10 minutes before wiping off.
- Dispose of sharp items (e.g., razor blades, needles, etc.) in a hard-sided container and then tape it shut.
- Consider the risks involved with receiving services from a personal service facility where the skin may be intentionally or unintentionally broken (e.g., tattooing, piercing, or manicure/pedicure facilities).
- Although individuals are not obligated to disclose HBV status, there are situations in which informing healthcare providers (e.g., doctor, dentist, etc.) or others of disease status may enhance general care and safety.
- Advise sex partners of HBV status and practice safe sex (e.g., use condoms).
- HBV-positive healthcare workers or other workers who may be at higher risk to transmit HBV and who are uncertain about the risks or proper practices to minimize the risk to patients should consult with employee health, an infection control practitioner, or patient safety group.
- Practice a healthy lifestyle, including limiting or avoiding alcohol consumption, as alcohol is a risk factor for more rapid progression of the disease.
- Prescribed or over-the-counter medications and/or homeopathic products may pose risks and/or be contraindicated for those with liver conditions, such as HBV. Consult a pharmacist before using any of these.
- If considering pregnancy, discuss with a healthcare provider the risk of transmission to the infant and the transmission factors associated with breastfeeding.
- Discuss perinatal transmission and the importance of identifying any contacts who may be pregnant. Suspicion of HBV in a pregnant woman warrants action to confirm diagnosis. If positive, ensure appropriate follow-up.
- If nipples are cracked and bleeding, consider abstaining from breastfeeding until they are healed.
- For further information about best practice recommendations for harm reduction, see: catie.ca/en/programming/best-practices-harm-reduction.
- Discuss the high infectivity and ease of transmission of HBV.
- Discuss long-term prognosis and explain carrier status (chronic infection). 1-10% of HBV-infected adults become carriers, and 15-25% of carriers develop cirrhosis or liver cancer. Reassure and support clients when discussing long-term prognosis.

Educating and following up carriers (chronic infection)

In addition to the education provided to persons with acute hepatitis B infection as described above, education for carriers should also include:

- The carrier [and the investigator] should encourage household contacts and existing or new sexual partners to be vaccinated against HBV.
- One PH visit/call with clients when they are determined to be carriers is warranted to review information about prevention of transmission to others.

Contact Tracing

Prophylaxis

Pre-exposure

Hepatitis B Immunization

All household and sexual contacts of acute cases and carriers should be vaccinated.

Immunization recommendations are based on the [Canadian Immunization Guide](#). Please refer to the online version of this document, which is updated regularly.

For information about eligibility for publicly funded hepatitis B vaccine, please see: novascotia.ca/dhw/CDPC/documents/Immunization-Manual.pdf

Consult the latest edition of the Canadian Immunization Guide for details about specific dosages, booster doses, post-vaccination serologic testing, etc.

Post exposure

Contacts of a HBsAg+ case

Administration of post-exposure prophylaxis (hepatitis B vaccine and/or immunoglobulin) is time-sensitive and should be offered to susceptible individuals in the following circumstances:

- Infants born to mothers with acute or chronic HBV infection
- Percutaneous or mucosal exposure to blood or bodily fluids potentially containing HBV virus
- Sexual or household contacts of an acute case or chronic carrier of HBV

Please refer to [Canadian Immunization Guide](#) for details on dosing and timing

Please refer to the [N.S. Immunization Guide](#) for process to access HBIG

Education of contacts

If Public Health is notifying contacts, inform the contacts of the following:

- Their potential exposure
- An explanation of the illness (description of the disease, symptoms, etc.)
- Recommendation for testing
- The range of clinical presentation from no symptoms to very ill
- Incubation period
- The high infectivity of HBV
- Explain mother to child vertical transmission and the importance of identifying any contacts who may be pregnant. Children have a much greater chance of becoming carriers. Suspicion of HBV in a pregnant woman warrants action to confirm diagnosis. If positive, ensure appropriate follow-up.

Surveillance forms

Surveillance Case Report Form

Hepatitis B, Hepatitis C, Hepatitis D Case Report Form

Hepatitis B and C Congenital Case Report Form

novascotia.ca/dhw/populationhealth/surveillanceguidelines/Surveillance_Forms.pdf

General Information Sheet

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