Ministry of Health and Long-Term Care

Infectious Diseases Protocol

Appendix A: Disease-Specific Chapters

Chapter: Hepatitis B

Effective: February 2019

Ontario

Hepatitis B

☒ Communicable

☐ Virulent

Health Protection and Promotion Act:
O. Reg. 135/18 (Designation of Diseases)

1.0 Aetiologic Agent

Hepatitis B virus (HBV) is the causative agent. It is a deoxyribonucleic acid (DNA) virus composed of a nucleocapsid core (HBcAg) and is surrounded by an outer lipoprotein coat containing the surface antigen (HBsAg).[1]

2.0 Case Definition

2.1 Surveillance Case Definition

Refer to Appendix B for Case Definitions.

2.2 Outbreak Case Definition

The outbreak case definition varies with the outbreak under investigation. Please refer to the *Infectious Diseases Protocol, 2018* (or as current) for guidance in developing an outbreak case definition as needed.

The outbreak case definitions are established to reflect the disease and circumstances of the outbreak under investigation. The outbreak case definitions should be developed for each individual outbreak based on its characteristics, reviewed during the course of the outbreak, and modified if necessary, to ensure that the majority of cases are captured by the definition. The case definitions should be created in consideration of the outbreak definitions.

Outbreak cases may be classified by levels of probability (*i.e.* confirmed and/or probable).

3.0 Identification

3.1 Clinical Presentation

Infants and children with acute HBV infection rarely have symptoms, while 30%-50% of adults are symptomatic.[1] The onset of symptoms is usually insidious with anorexia, fatigue, vague abdominal discomfort, joint pain, fever and jaundice.[1]

The risk of becoming a chronic HBV carrier is 90% to 95% for infants, 25% to 50% for children over one and less than five years of age, and 3% to 10% for adolescents and adults.[2] Chronic HBV carriers may not display symptoms or experience symptoms associated with cirrhosis and other complications of chronic HBV infection.[1]

3.2 Diagnosis

See Appendix B for diagnostic criteria relevant to the Case Definitions.

For further information about human diagnostic testing, contact the Public Health Ontario Laboratories or refer to the Public Health Ontario Laboratory Services webpage: http://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/default.aspx

4.0 Epidemiology

4.1 Occurrence

HBV infection occurs worldwide, and is endemic with little seasonal variation. In highly endemic countries, most infections occur during infancy and early childhood. In low endemic countries infections occur mostly in young adults.[1]

Between 2013 and 2017, an average of 100 cases of acute HBV infection were reported each year in Ontario.[i]

Please refer to Public Health Ontario's (PHO) Reportable Disease Trends in Ontario reporting tool and other reports for the most up-to-date information on infectious disease trends in Ontario.

http://www.publichealthontario.ca/en/DataAndAnalytics/Pages/DataReports.aspx

For additional national and international epidemiological information, please refer to the Public Health Agency of Canada and the World Health Organization.

4.2 Reservoir

Humans.[1]

4.3 Modes of Transmission

Via infectious body fluids including blood, saliva, cerebrospinal fluid (CSF), pleural, peritoneal, semen and vaginal secretions and any other body fluid containing blood.[1] The risk of transfusion-related hepatitis B is extremely low in Canada and the USA because all blood and blood products are tested.[2]

Routes of transmission include:[1,2]

- percutaneous, principally injection drug users
- sexual: anal, vaginal, oral
- horizontal: household contacts
- vertical: mother to neonate

4.4 Incubation Period

The incubation period is 45-180 days, average 60-90 days. It may be as short as 2 weeks to the appearance of HBsAg and rarely as long as 6-9 months. The variation is

[i] Data included in the epidemiological summary are from January 1, 2013 to December 31, 2017. Data were extracted from Query on February 7, 2018 and therefore are considered preliminary.

related in part to the amount of virus in the inoculum, the mode of transmission and host factors.[1]

4.5 Period of Communicability

All persons who are HBsAg positive are potentially infectious. Blood is infective many weeks before onset of first symptoms and remains infective through the acute course of disease.[1] The infectivity of chronically infected persons varies from high to modest.[1]

Cases and carriers positive for hepatitis B envelope antigen (HBAg) are known to be highly infectious. Chronic carriers can experience spikes in viremia over time, impacting infectivity.[1]

4.6 Host Susceptibility and Resistance

All non-immunized and not adequately immunized people are susceptible; disease presentation is usually milder in children and may be asymptomatic in infants.[1]

5.0 Reporting Requirements

As per Requirement #3 of the "Reporting of Infectious Diseases" section of the *Infectious Diseases Protocol, 2018* (or as current), the minimum data elements to be reported for each case are specified in the following:

- *Ontario Regulation 569* (Reports) under the *Health Protection and Promotion Act* (HPPA);[3]
- The iPHIS User Guides published by PHO; and
- Bulletins and directives issued by PHO.

Refer to the *Sexual Health and Sexually Transmitted/Blood-Borne Infections Prevention and Control Protocol, 2018* (or as current) for reporting and data collection requirements.[4]

6.0 Prevention and Control Measures

In the event that publicly funded vaccines are needed for case and contact management, the board of health should contact the Ministry of Health and Long-Term Care's (ministry) immunization program at vaccine.program@ontario.ca as soon as possible.

6.1 Personal Prevention Measures

- Immunize as per the current Publicly Funded Immunization Schedules for Ontario.[5]
- Prenatal screening for all women for each pregnancy so that newborns can receive prophylaxis, if necessary.
- Counselling/education regarding risk behaviours.
- Harm reduction strategies such as needle exchange programs.
- Promote screening of adopted children from countries with high prevalence of infection and persons in high risk groups.

- Promote screening for HBV in individuals from countries with high prevalence of this infection.
- Hospital policies and procedures to ensure HBV screening and availability of Hepatitis B immune globulin (HBIg) and vaccination for exposed newborns.[6]
- The Blood-Borne Diseases Surveillance Protocol for Ontario Hospitals details preventive measures to reduce the risk of transmission of hepatitis B in employees who are at risk of exposure.[7]

For more information on prevention measures refer to the following: Primary Care Management of Hepatitis B – Quick Reference (HBV-QR).[6]

6.2 Infection Prevention and Control Strategies

- Use of routine practices at all times.
- Adequate sterilization of instruments used in invasive procedures including personal service settings such as ear piercing and tattooing.
- Appropriate measures for disinfection following body fluid spills.
- Occupational exposures should be managed according to the Blood-Borne Diseases Surveillance Protocol for Ontario Hospitals.[7]
- Maximize uptake of hepatitis B vaccine in those at high risk of exposure.

More information is available in the Primary Management of Hepatitis B – Quick Reference Guide (HBV-QR) and Blood-Borne Diseases Surveillance Protocol for Ontario Hospitals.[6,7]

Refer to PHO's website at www.publichealthontario.ca to search for the most up-to-date information on Infection Prevention and Control.

6.3 Management of Cases

In addition to the requirements set out in the Requirement #2 of the "Management of Infectious Diseases – Sporadic Cases" and "Investigation and Management of Infectious Diseases Outbreaks" sections of the *Infectious Diseases Protocol, 2018* (or as current), the board of health shall investigate cases to determine the source of infection. Refer to Section 5: Reporting Requirements above for relevant data to be collected during case investigation.

The following should also be considered:

- Acute cases of HBV should abstain from sexual contact or practice safer-sex until partners and or/relevant contacts have been appropriately screened and or immunized.[6]
- Ensure that pregnant women, identified as HBV carriers are aware of their status as is their health care provider following the pregnancy.
- Ensure that acute HBV cases are tested for other STIs and HIV as appropriate.
- Ensure HBV carriers are linked with appropriate health care services.
- Acute cases and HBV carriers should not donate blood.
- Some regulatory professional colleges have developed policies addressing members who are infected with blood-borne viruses. Health care professionals

licenced by these regulatory colleges, who are infected with hepatitis B must be aware of and follow the requirements of their regulatory college.

There is ongoing study of anti-viral treatment options that can produce sustained virologic response and delay or prevent long-term sequelae in chronic hepatitis B carriers.

For management of cases refer to the *Sexual Health and Sexually Transmitted/Blood-Borne Infections Prevention and Control Protocol, 2018* (or as current).[4] For more information, refer to the Primary Management of Hepatitis B – Quick Reference Guide (HBV-QR).[6]

6.4 Management of Contacts

Contacts include:

- household members
- persons who share personal care items such as razors or tooth brushes, or needle sharing partners
- sexual contacts
- persons exposed to infected blood, or body fluids
- infants born to HBV infected mothers

Management of contacts is done in collaboration with the attending medical professional. Contacts should be assessed and immunized as required.

HBIG should be administered to infants born to HBsAg positive mothers within 24 hours after birth. Additionally, the administration of HBIG could be considered in the instance of percutaneous, mucosal or sexual exposure to an HBV positive person.[2]

In the instance of potential exposure to hepatitis B, individuals should, where relevant, be made aware of the *Mandatory Blood Testing Act*.[8]

For contact management of cases, refer to the *Sexual Health and Sexually Transmitted/Blood-Borne Infections Prevention and Control Protocol, 2018* (or as current).[4] For more information, refer to the Primary Management of Hepatitis B – Quick Reference Guide (HBV-QR).[6]

6.5 Management of Outbreaks

An outbreak is defined as the occurrence of two or more cases of HBV infection linked by time or a common exposure source or setting.

Please see the *Infectious Diseases Protocol, 2018* (or as current) for the public health management of outbreaks or clusters in order to identify the source of illness, manage the outbreak and limit secondary spread.

7.0 References

1. Heymann DL, editor. Control of Communicable Diseases Manual. 20 ed. Washington, D.C: American Public Health Association; 2015.
2. National Advisory Committee on Immunization, Public Health Agency of Canada. Part 4- Active Vaccines: Hepatitis B Vaccine. 2018. In: Canadian Immunization

Guide [Internet]. Evergreen ed. Ottawa, ON: Her Majesty the Queen in Right of Canada, [cited May 1, 2018]. Available from: https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-4-active-vaccines.html

3. Health Protection and Promotion Act, R.S.O. 1990, Reg. 569, Reports, (2018). Available from: https://www.ontario.ca/laws/regulation/900569
4. Ontario, Ministry of Health and Long-Term Care. Sexual Health and Sexually Transmitted/ Blood-Borne Infections Prevention and Control Protocol, 2018. Toronto, ON: Queen's Printer for Ontario; 2018. Available from: http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/protocolsguidelines.aspx
5. Ontario, Ministry of Health and Long-Term Care. Publicly Funded Immunization Schedules for Ontario: December 2016. Toronto, ON: Queen's Printer for Ontario; 2016. Available from: http://www.health.gov.on.ca/en/pro/programs/immunization/schedule.aspx
6. Public Health Agency of Canada. Primary Care Management of Hepatitis B – Quick Reference (HBV-QR). Ottawa, ON: Her Majesty the Queen in Right of Canada; 2014. Available from: https://www.canada.ca/en/public-health/services/reports-publications/primary-care-management-hepatitis-b-quick-reference.html
7. Ontario Hospital Association, Ontario Medical Association. Blood-Borne Diseases Surveillance Protocol for Ontario Hospitals. Toronto, ON: Ontario Hospital Association; 2016. Available from: https://www.oha.com/labour-relations-and-human-resources/health-and-safety/communicable-diseases-surveillance-protocols
8. Mandatory Blood Testing Act, 2006, S.O. 2006, c. 26 (2018). Available from: https://www.ontario.ca/laws/statute/06m26

8.0 Document History

Table 1: History of Revisions

Revision Date	Document Section	Description of Revisions
December 2014	General	New template. Title of Section 4.6 changed from "Susceptibility and Resistance" to "Host Susceptibility and Resistance". Title of Section 5.2 changed from "To Public Health Division (PHD)" to "To the Ministry of Health and Long-Term Care (the ministry) or Public Health Ontario (PHO), as specified by the ministry". Section 9.0 Document History added. "Hepatitis B" changed to "HBV".
December 2014	2.2 Outbreak Case Definition	Entire section revised.
December 2014	3.1 Clinical Presentation	Removal of "many cases are asymptomatic." Addition of "Chronic HBV carriers may not display symptoms or experience…"
December 2014	3.2 Diagnosis	Addition of "For further information about human diagnostic testing…"
December 2014	4.1 Occurrence	Second paragraph revised to reflect Ontario context. Addition of third paragraph "Please refer to the Public Health Ontario Monthly Infectious Diseases Surveillance Reports…"
December 2014	4.5 Period of Communicability	Addition of "and chronic period of disease" to the end of the first paragraph. Addition of second paragraph "The younger an individual is when exposed to HBV, the more likely they will become a chronic carrier…"
December 2014	4.6 Host Susceptibility and Resistance	"All non-immune people are susceptible;" changed to "All non-immunized and not adequately immunized people are susceptible;…"

Revision Date	Document Section	Description of Revisions
December 2014	5.1 To Local Board of Health	"Laboratory confirmed cases shall be reported to" changed to "Individuals who have or may have HBV infection shall be reported as soon as possible to".
December 2014	5.2 To the Ministry of Health and Long-Term Care (the ministry) or Public Health Ontario (PHO), as specified by the ministry	Removal of "to PHD". Second bullet changed from "The disease specific User Guides published by the Ministry, and" to "The iPHIS User Guides published by PHO, and…" "the Ministry" changed to "PHO" in third bullet.
December 2014	6.1 Personal Prevention Measures	Bullet ordering rearranged. "Individual immunization with Hepatitis B vaccine by universal immunization programs" changed to Immunize as per the current Publicly Funded Immunization Schedules for Ontario". Addition of "Hospital policies and procedures to ensure HBV screening and availability of Hepatitis B…" Addition of "The Blood-Borne Disease Surveillance Protocol for Ontario Hospitals…" Addition of "For more information on prevention measures refer to…"
December 2014	6.2 Infection Prevention and Control Strategies	Removal of "Investigation and follow-up of contacts of acute and chronic cases". Removal of "Infected medical and dental personal should perform exposure-prone procedures…" Addition of "Occupational exposures should be managed according to the Blood-Borne Diseases Surveillance Protocol for Ontario Hospitals". Addition of "Maximize uptake of hepatitis B vaccine in those at high risk of exposure". Addition of "Refer to Public Health Ontario's website…"

Revision Date	Document Section	Description of Revisions
December 2014	6.3 Management of Cases	Entire section revised.
December 2014	6.4 Management of Contacts	Removal of “Household and sexual”. Addition of “HBV carriers should disclose their status to all sexual partners and to household and needle sharing contacts”. Addition of “HBIG should be administered to infants born to HBsAg positive mothers within 24 hours after birth.” Addition of “In the instance of potential exposure to hepatitis B individuals should where relevant, be made away of the *Mandatory Blood Testing Act* (2006).”
December 2014	6.5 Management of Outbreaks	Addition of “Ensure that the ministry and PHO are notified of an HBV outbreak, particularly if extraordinary testing for HBV through the PHO laboratory is contemplated”. Addition of “Consult with experts including PHO regarding the use of HBIG during an outbreak”. Addition of “Coordinate and collect appropriate clinical specimens where applicable”. Addition of “Work with the PHO laboratory services to use genetic methodology to link cases in an HBV outbreak”.
December 2014	7.0 References	Updated.
December 2014	8.0 Additional Resources	Updated.

Revision Date	Document Section	Description of Revisions
February 2019	General	Minor revisions were made to support the regulation change to Diseases of Public Health Significance. Common text included in all Disease Specific chapters: Surveillance Case Definition, Outbreak Case Definition, Diagnosis, Reporting Requirements, Management of Cases, and Management of Outbreaks. The epidemiology section and references were updated and Section 8.0 Additional Resources was deleted.
February 2019	3.1 Clinical Presentation	Minor updates to chronic carrier state.
February 2019	4.5 Period of Communicability	Reference to chronic carrier state removed.
February 2019	6.0 Prevention and Control Measures	Updates regarding the ordering of publicly funded vaccines for case and contact management.
February 2019	6.1 Personal Prevention Measures	Updates to information on *Immunization of School Pupils Act* and *Child Care and Early Years Act, 2014*.


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