Ministry of Health and Long-Term Care

Infectious Diseases Protocol

Appendix A: Disease-Specific Chapters

Chapter: Hepatitis A

Revised March 2017

Ontario

Hepatitis A

☒ Communicable

☐ Virulent

Health Protection and Promotion Act:
Ontario Regulation 558/91 – Specification of Communicable Diseases

Health Protection and Promotion Act:
Ontario Regulation 559/91 – Specification of Reportable Diseases

1.0 Aetiologic Agent

Hepatitis A infection is caused by the hepatitis A virus (HAV), a 27-nanometer picornavirus, positive-strand RNA virus. It has been classified as a member of the family *Picornaviridae*.[1]

2.0 Case Definition

2.1 Surveillance Case Definition

See Appendix B

2.2 Outbreak Case Definition

Outbreak case definitions are established to reflect the disease and circumstances of the outbreak under investigation. For example, confirmed outbreak cases must at a minimum, meet the criteria specified for the provincial surveillance confirmed case classification. Consideration should also be given to the following when establishing outbreak case definitions:

- Clinical and/or epidemiological criteria;
- The time frame for occurrence (i.e. increase in endemic rate);
- A geographic location(s) or place(s) where cases live or became ill/exposed;
- Special attributes of cases (e.g., age, underlying conditions); and
- Further strain characterization and typing as appropriate, which may be used to support linkage.

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

3.0 Identification

3.1 Clinical Presentation

Typically, hepatitis A is an acute, self-limiting liver infection. Clinical presentation varies with age of infection.[2] Infection is usually asymptomatic or inapparent in children, and jaundice develops in < 10% of children 6 years and under.[3] Adults are typically symptomatic, with more severe disease. Symptoms may range from mild flu-like illness; to 1 to 2 weeks of mild, self-limited disease with jaundice; to fulminant hepatitis. Typically, acute clinical illness is characterized by a 1 to 7 day prodrome of abrupt onset fever, malaise, anorexia, nausea and abdominal pain followed by jaundice.[3, 2] Dark urine and light-coloured stools, as well as pruritis may occur, and an enlarged liver may be seen. Extra-hepatic complications may occur.[4] It has been reported that between 3% and 20% of cases may experience relapsing disease.[2] Fulminant hepatitis and death are rare. There is usually complete recovery without complications or sequelae.[1] Chronic infection is not known to occur.

3.2 Diagnosis

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

Note: Serology tests indicating IgM anti-HAV antibodies confirms recent infection. Antibodies are generally detectable in serum 5-10 days after infection and usually decrease to undetectable levels within 6 months after onset of infection.[1, 5] In rare cases, they may persist for longer.

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

Worldwide, sporadic and epidemic. In endemic areas, adults are usually immune.

In Ontario, hepatitis A occurs throughout the year with no clear seasonal pattern. Between 2007 and 2011, an average of 120 cases were reported annually. The disease is most common among school-aged children and young adults.

Please refer to the Public Health Ontario Monthly Infectious Diseases Surveillance Reports and other infectious diseases reports for more information on disease trends in Ontario.[6, 7]

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

4.2 Reservoir

Humans; rarely chimpanzees and other primates.[1]

4.3 Modes of Transmission

HAV infection is transmitted primarily by the fecal-oral route, through direct contact with infected people or indirectly through ingestion of contaminated water or foods (e.g. seafood harvested from contaminated water).[1]

Fecal-oral transmission has been reported as the mode of transmission in outbreaks associated with daycare center employees or attendees.[1]

In recent years, contaminated produce (such as green onions, blueberries, frozen strawberries, sun dried tomatoes, salad and lettuce) along with oysters and orange juice, have been associated with community-wide outbreaks (see additional resources).

On rare occasions, transmission has been reported after exposure to HAV-contaminated blood or blood products obtained from viremic donors during the incubation period of their infection.[1] Transmission may also occur through sexual activities that include direct or indirect oral-anal contact but not through exposure to saliva, semen or urine.[3] For example, several outbreaks have been associated with injecting and non-injecting drug use and men with multiple male sex partners.[1]

Transmission from mother to newborn infant (that is, vertical transmission) is rare.[5]

The virus may persist for days or weeks in the environment.[3]

4.4 Incubation Period

The incubation period ranges from 15 to 50 days with an average of 28 to 30 days.[1]

4.5 Period of Communicability

Maximum communicability occurs during the latter part of the incubation period with peak levels in the 2 weeks before clinical illness. Communicability diminishes rapidly thereafter and ends shortly after the onset of jaundice.[3]

Cases are considered non-infectious 7 days after onset of jaundice although prolonged viral excretion up to 6 months has been documented in infants and children.[1] Chronic shedding of HAV in feces does not occur.[1]

4.6 Host Susceptibility and Resistance

Seroprevalence of hepatitis A virus (HAV) antibody (indicating protection from natural infection or previous vaccination) has been assessed nationally by several studies and has been shown to increase with increasing age reflecting secular trends in the HAV transmission dynamics.[8-10] Among those aged 14-19 years, it was estimated at 17.3%, rising to 64.6% among those 60-79 years.[8] HAV seroprevalence in Canadian children

aged 8-13 years residing within Canadian provinces was found to be only 2-3% in this age group, demonstrating the extent of this age group's susceptibility.[10]

Immunity following natural infection is thought to be life-long (1). Protective antibody levels following vaccination will persist for at least 20 years or longer and protection likely persists even when antibodies are no longer measurable due to immune memory.[3]

The risk of hepatitis A infection for non-immune travellers to developing countries had been estimated to be as high as 1 to 5/1,000 per month, cases in males being 1.5 times higher than in females. More recent data on Swiss travellers suggest that the risks of acquiring hepatitis A infection have markedly decreased over the last 10 to 15 years, with more recent estimates of 0.1 to 1/1,000 per month. This still represents a significant risk of illness. In addition, the risk may be much higher for low-budget travellers, volunteer humanitarian workers and immigrants visiting friends and relatives in their homelands, who may be eating in settings with poor hygiene.[11]

5.0 Reporting Requirements

5.1 To local Board of Health

Individuals who have or may have HAV infection shall be reported as soon as possible the medical officer of health by persons required to do so under the *Health Protection and Promotion Act*, R.S.O. 1990 (HPPA).[12]

5.2 To the Ministry of Health and Long-Term Care (the ministry) or Public Health Ontario (PHO), as specified by the ministry

Report only case classifications specified in the case definition using the integrated Public Health Information System (iPHIS), or any other method specified by the ministry **within one (1) business day of receipt of initial notification** as per iPHIS Bulletin Number 17: Timely Entry of Cases.[13]

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);[14, 13]
- The iPHIS User Guides published by PHO; and,
- Bulletins and directives issued by PHO.

6.0 Prevention and Control Measures

6.1 Personal Prevention Measures

Proper personal hygiene and hand washing hygiene are key to prevent transmission. As well, travellers going to developing countries should be aware of how to carefully select

food and drink to avoid infection. Pre-travel counselling may also include recommendation for Hepatitis A vaccination, depending on destination and itinerary. More information for travellers can be found at:

The Government of Canada's Travel Health and Safety Page: http://travel.gc.ca/travelling/health-safety/diseases/hepatitis-a

The Canadian Immunization Guide recommends hepatitis A vaccination for additional groups:[3]

- Travelers to or immigrants from HAV endemic areas;
- Household or close contacts of children adopted from HAV endemic countries;
- Residents of communities that have high endemic rates of HAV or are at risk of HAV outbreaks;
- People with life-style risks for infection, including people engaging in illicit drug use (injectable and non-injectable) and men who have sex with men (MSM) People who have chronic liver disease, including persons infected with hepatitis C. While these persons may not be at increased risk of infection, they are at increased risk of more severe disease if infection occurs;
- People with hemophilia A or B receiving plasma-derived replacement clotting factors;
- Military personnel and humanitarian relief workers likely to be posted to areas with high rates of HAV;
- Zoo-keepers, veterinarians and researchers who handle non-human primates;
- Workers involved in research on HAV or production of hepatitis A vaccine who may be exposed to HAV; and
- Any person who wishes to decrease his or her risk of HAV.

However, in Ontario, only the following high risk groups are eligible to receive publicly-funded hepatitis A vaccine, for primary prevention of infection:[15]

- Persons with chronic liver disease (including Hepatitis B and C);
- Persons engaging in intravenous drug use; and
- Men who have sex with men.

6.2 Infection Prevention and Control Strategies

Strategies:

- Advise cases with confirmed HAV not to donate blood for six months or as required by Canadian Blood Services;
- Routine practices and contact precautions are recommended.

Refer to Public Health Ontario's website at www.publichealthontario.ca to search for the most up-to-date Provincial Infectious Diseases Advisory Committee (PIDAC) best practices on Infection Prevention and Control (IPAC).

PIDAC best practice documents can be found at: https://www.publichealthontario.ca/en/BrowseByTopic/InfectiousDiseases/PIDAC/Pages/PIDAC_Documents.aspx

6.3 Management of Cases

Investigate cases of hepatitis A to determine the source of infection, and to inform case and contact management. Refer to Section 5: Reporting Requirements above for relevant data to be collected during case investigation. In accordance with HPPA *Regulation 569* (Reports),[14] the following disease-specific information should also be obtained:

- Symptoms and date of symptom onset, including date of onset of jaundice;
- Determine the dates of the infectious period (from 14 days prior to onset of symptoms to 7 days after onset of jaundice);
- Identify potential contacts during the infectious period;
- Determine if received hepatitis A vaccine in the two weeks prior to the blood test to rule out false positives;
- Determine possible source of infection, by identifying risk factors including:
  - travel history,
  - detailed food history,
  - contact with a symptomatic person / person with hepatitis A, including household/close contact,
  - attendee or employee of child care centre, resident or staff in an institution
  - men who have sex with men,
  - intravenous drug users (IDU), and
  - attendance at any large functions in previous 50 days.

Education

Provide education to cases regarding transmission and personal hygiene. Emphasis should be placed on proper hand hygiene practices (e.g. after using the bathroom) in household settings. Encourage limiting food handling activities and the sharing of common food items with household and close contacts for the duration of the infectious period.

Exclusion

Exclude cases such as food handler, child care staff and attendees and health care workers* from high risk settings for 14 days after onset of symptoms, or 7 days after onset of jaundice, whichever comes earlier.

*If the healthcare setting is a hospital, use the "Enteric Diseases Surveillance Protocol for Ontario Hospitals" (OHA and OMA Joint Communicable Diseases Surveillance Protocols Committee, revised December 2015, or as current) for exclusion criteria.

http://www.oha.com/Services/HealthSafety/Pages/CommunicableDiseasesSurveillanceProtocols.aspx

6.4 Management of Contacts

Contact identification

A contact is defined as a person who has had exposure to a case during the time the case is infectious. The contact may acquire infection by the fecal-oral route by either person to person contact or ingestion of contaminated food or water.[16]

Identify contacts, in particular:

- Those living in same household;
- Persons who are close non-household contacts such as sexual partners or drug sharing partners;
- Contacts who are food handlers;
- Food establishment patrons if case is a food handler who worked during the period of communicability. Day care and institutional attendees or staff (e.g. correctional facilities, institutions for the developmental disabled, etc).

Education

Provide education about proper hygiene, disease transmission and symptoms; advise to seek medical care if symptoms develop.

Exclusion

Determine if any of the contacts are ill. Exclusion of symptomatic contacts from high risk settings is the same as for cases. In addition, ensure contact is screened to confirm if acutely ill with hepatitis A (i.e.anti-HAV IgM positive).

Exclusion is generally not warranted for asymptomatic contacts of hepatitis A cases. However, there may be exceptional circumstances in which the MOH may consider, on a case-by-case basis, excluding an asymptomatic close/household contact from food handling duties IF:

- the contact does not receive timely post-exposure prophylaxis (PEP, see below) or does not have serological evidence of immunity, AND
- the contact is assessed to be at high risk of both acquiring and/or transmitting hepatitis A via handling of food that is uncooked / after it is cooked (i.e., ready-to-eat).

Considerations may include whether the case had poor hygiene practices or diarrhea or was diapered by the contact while infectious and whether the contact has been educated about hepatitis A (signs and symptoms of hepatitis A and what to do if they occur, and the incubation period).

Post-exposure Prophylaxis Recommendations:

The Provincial Infectious Diseases Advisory Committee, Immunization (PIDAC-I) has post-exposure prophylaxis (PEP) for hepatitis A recommendations as follows:[17]

PEP should be offered to household and close contacts of HAV case. Non-household close contacts include, sexual contacts, individuals who have handled diapers or who have assisted with the toileting or other personal care of individuals infected with HAV, and individuals who have shared illicit drugs with a case.

PEP interventions include the administration of monovalent hepatitis A vaccine or the administration of serum immunoglobulin (IG) or both, depending on the age and underlying health of the contact.

Susceptible household and close contacts should receive the following for hepatitis A PEP:

- Infants < 12 months: IG
- Healthy children and adults 1-49 years of age: vaccine
- Healthy adults ≥ 50 years of age: vaccine plus IG*
- Immuno-compromised: vaccine plus IG
- Chronic liver disease: vaccine plus IG*

The asterisks denote where the advice of PIDAC-I differs from that of the Canadian Immunization Guide (CIG).[3] The evidence and rationale for alternate advice is summarized in the PIDAC-I document on HA PEP.[17] Concurrent administration of vaccine plus IG is delivered via separate needles/syringes and separate anatomical sites. Only one dose of monovalent vaccine is indicated for PEP. For long-term immunity, two doses total must be administered 6-12 months apart as per the routine schedule.

Timeframe for offering PEP

Contacts of a HAV case should receive PEP as soon as possible, and ideally, within 14 days after exposure to a HAV case.

Hepatitis A in childcare settings and kindergartens

Special consideration should be given to cases of HAV occurring in childcare settings including daycares, pre-schools, and kindergartens as young children are recognized to be very efficient at transmitting HAV infection, in relation to the need for diapering, developmental toileting behaviors and poor hand hygiene. Consultation with the medical officer of health is recommended in these scenarios.

PIDAC-I recommends the following for HAV exposure in childcare settings:

Hepatitis A index case(s) observed in childcare setting:

- If index case attends a childcare setting and the source of infection is obvious (e.g. recent travel of the case or of a household contact), all attendees and staff should receive PEP, ideally within 14 days of symptom onset in the index case. The purpose of providing prophylaxis to attendees and staff is to prevent cases due to secondary transmission of HAV.
- If more than 14 days have elapsed since symptom onset in the case, or where the source of the index case is unknown secondary transmission may have already occurred within the facility and a broader range of contacts should be offered PEP to prevent cases of tertiary transmission. These contacts include: all attendees, all household contacts of attendees, and all staff. **Family members of attendees who are > 50 years of age may receive HAV vaccine alone for PEP, unless they are a household/ close contact of a case in which case they would also receive IG.**
- Note: If there are two or more cases that occur in a childcare setting, please refer to the next section on Management of Outbreaks.

Childcare attendee is exposed to hepatitis A (i.e. a contact):

In scenarios where a childcare attendee is a **close contact of a case of HAV** (for example, is a household contact) and attends a childcare setting, PIDAC-I recommends:

- If the contact received PEP within 14 days of symptom onset in the index case and asymptomatic transmission within the household is unlikely to have already occurred (eg. index case recently returned from travel), supervised hand washing and increased surveillance should occur within any childcare settings the contact attends.
- If the contact did not receive PEP within 14 days of symptom onset in the index case, or if there is concern that unrecognized asymptomatic transmission in the household may have occurred, this would support a strategy to reduce the risk of further transmission: offering PEP should be considered for all close contacts of the exposed child (including fellow day care attendees and staff).

Staff who are > 50 years of age may receive HAV vaccine alone, unless they are a household/close contact of a case in which case they would also receive IG.

Contacts are generally referred to their health care provider to receive the vaccine as prophylaxis. The vaccine can be provided to the physician by the local health unit. In outbreak scenarios, the local board of health may decide to provide the vaccine and offer immunization clinics. Serum immune globulin (IG) must be accessed through Canadian Blood Services.

PEP considerations for potential contacts of a hepatitis A case who is a food handler

If the case is a food handler, a risk assessment should inform PEP considerations (i.e., whether to recommend post-exposure HAV vaccine and/or immune globulin) for potential contacts who may have been exposed to contaminated food/water (e.g., food premise patrons). Consideration may be given as to whether, in a particular context:

- the case was infectious while working, AND
- handled foods prior to consumption which were not cooked after handling, AND
- the food handler's practices were not hygienic, OR the food handler had diarrhea, AND
- the contacts can be identified/alerted and be offered immunoprophylaxis within 14 days of the last exposure to the case while the case was in the infectious period.[16]

Of note, the PIDAC-I recommendations on hepatitis A PEP for susceptible household and close contacts do not address potential contacts of a hepatitis A case who is a food handler. If a decision is taken to recommend PEP for this group (e.g., food premise patrons), consider both the context-specific risk assessment and the PIDAC-I guidance to determine which specific PEP intervention(s) to recommend to individual contacts. For healthy adults 50 years of age or above in this group, MOH consultation should be undertaken to determine whether to recommend hepatitis A vaccine and/or immune globulin.

Other non-household, non-close contacts

PEP is not routinely recommended for school or workplace contacts, or health care workers caring for HAV cases, unless an outbreak is suspected (ref to CIG).

Note: Only one dose of HAV vaccine is indicated for PEP efficacy and in Ontario, only one dose is publicly funded for PEP, unless an individual is otherwise eligible for publicly funded HAV vaccine for primary prevention.[17]

6.5 Management of Outbreaks

Provide public health management of outbreaks or clusters in order to identify the source of illness, stop the outbreak and limit secondary spread.

Two or more cases linked in time and place to a common exposure is suggestive of an outbreak.

As per this Protocol, outbreak management shall be comprised of but not limited to, the following general steps:

- Confirm diagnosis and verify the outbreak;
- Establish an outbreak team;

- Develop an outbreak case definition. These definitions should be reviewed during the course of the outbreak, and modified if necessary, to ensure that the majority of cases are captured by the definitions;
- Implement prevention and control measures;
- Implement and tailor communication and notification plans depending on the scope of the outbreak;
- Conduct epidemiological analysis on data collected;
- Conduct environmental inspections of implicated premise where applicable;
- Coordinate and collect appropriate clinical specimens where applicable;
- Prepare a written report; and
- Declare the outbreak over in collaboration with the outbreak team.

Note: If two or more cases occur in association with a childcare setting (including staff, attendees and/or household members of attendees), this should be treated as an HAV outbreak with control measures implemented based on relevant features and epidemiology of the outbreak. In these scenarios, offering PEP to all staff, attendees and household members of attendees would generally be recommended.

Refer to Ontario's Foodborne Illness Outbreak Response Protocol (ON-FIORP) for multi-jurisdictional foodborne outbreaks which require the response of more than two Parties (as defined in ON-FIORP) to carry out an investigation. The ON-FIORP can be found here: http://health.gov.on.ca/en/pro/programs/publichealth/enviro/

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8.0 Additional Resources

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9.0 Document History

Table 1: History of Revisions

Revision Date	Document Section	Description of Revisions
March 2017	General	New Template
March 2017	6.3 Management of Cases	"Enteric Diseases Surveillance Protocol for Ontario Hospitals" reference updated
March 2017	7.0 References	Updated
March 2017	8.0 Additional Resources	Updated
March 2017	9.0 Document History	Updated


Ontario