Ministry of Health

Ontario Public Health Standards:
Requirements for Programs, Services and Accountability

Infectious Disease Protocol

Appendix 1: Case Definitions and Disease-Specific Information

Disease: Amebiasis

Effective: August 2023

Ontario

Amebiasis

☒ Communicable
☐ Virulent

Health Protection and Promotion Act (HPPA)[1]
Ontario Regulation (O. Reg.) 135/18 (Designation of Diseases)[2]

Provincial Reporting Requirements

☒ Confirmed case
☒ Probable case

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:

- O. Reg. 569 (Reports) under the HPPA;
- The iPHIS User Guides published by Public Health Ontario (PHO); and
- Bulletins and directives issued by PHO.[3,4]

Type of Surveillance

Case-by-case.

Case Definition

Confirmed Case

- Laboratory confirmation of infection with or without clinically compatible signs and symptoms.

Probable Case

- Clinically compatible signs and symptoms with an epidemiologic link to one or more laboratory-confirmed cases;

OR

- Supportive laboratory evidence of infection with or without clinically compatible signs and symptoms.

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.[3]

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).

Clinical Information

Clinical Evidence

- Clinically compatible signs and symptoms of intestinal amebiasis are characterized by a subacute onset of intermittent cramps, diarrhea, vomiting, and general malaise. Potential severe manifestations include sudden onset of fever, severe abdominal cramps, and an average of 15 to 20 stools per day consisting of liquid feces with bloody mucus. Complications include colonic granulomatous masses (ameboma), appendicitis, and peritonitis resulting from gut perforation.
- Extraintestinal amebiasis often presents as a liver abscess, and less commonly as a cerebral, pleuropulmonary, cardiac, perinephric, splenic, or rectovaginal abscess. Clinically compatible signs and symptoms include pain and inflammation at the infected site, fever, and weight loss.

Clinical Presentation

Most infections are asymptomatic.[5] Clinical presentations associated with *E. histolytica* infection include non-invasive intestinal infection (90% of cases), invasive intestinal amebiasis (10% of cases), and invasive extraintestinal amebiasis (< 1% of cases).[6]

Persons with non-invasive intestinal infection may be asymptomatic or may have mild non-specific and self-limiting intestinal tract complaints. Persons with invasive intestinal amebiasis may present as dysentery (bloody diarrhea), fulminant colitis, amebic appendicitis, and/or ameboma(s). Colitis generally presents as 1 to 3 weeks of increasingly severe diarrhea progressing to grossly bloody dysenteric stools with lower abdominal pain and tenesmus. Weight loss and fever may be present.[6]

An ameboma may occur as an annular lesion of the cecum or ascending colon that may be mistaken for colonic carcinoma or as a tender extra-hepatic mass, mimicking a pyogenic abscess. Amebomas usually resolve with anti-amebic therapy and do not require surgery.[6]

In a small proportion of people, extraintestinal disease may occur usually in the liver but can occur in the lungs, pleural space, pericardium, brain, skin, and genitourinary tract. Liver abscess may be acute with fever, abdominal pain, tachycardia, liver tenderness and hepatomegaly or chronic with weight loss, vague abdominal symptoms, and irritability.[6]

Laboratory Evidence

Laboratory Confirmation

Any of the following will constitute a confirmed case of amebiasis:

- Detection of *E. histolytica* antigens by enzyme immunoassay (EIA), direct immunofluorescence assay (DFA), or immunochromatographic testing (ICT) from an appropriate clinical specimen (e.g., gastrointestinal tract specimen or biopsy/aspirate/scraping from an extraintestinal site).

  OR

- Detection of *E. histolytica* nucleic acids by molecular methods (e.g. polymerase chain reaction) from an appropriate clinical specimen (e.g., gastrointestinal tract specimen or biopsy/aspirate/scraping from an extraintestinal site).

OR

- Demonstration of *E. histolytica* trophozoites by culture or histological staining from a biopsy/aspirate/scraping.

OR

- In the context of extraintestinal amebiasis: serological demonstration of a high positive *E. histolytica* antibody titre in a single serum sample by enzyme immunoassay or indirect hemagglutination.

OR

- In the context of extraintestinal amebiasis: serological demonstration of seroconversion from negative to positive *E. histolytica* antibody titre in paired acute and convalescent sera collected 2-4 weeks apart by enzyme immunoassay or indirect hemagglutination.

Supportive Laboratory Evidence of Infection

- Demonstration of *E. histolytica/E. dispar/E. moshkovskii/E. bangladeshi* by microscopic examination from a gastrointestinal tract specimen.

OR

- In the context of extraintestinal amebiasis: serological demonstration of a low positive *E. histolytica* antibody titre in a single serum sample by enzyme immunoassay or indirect hemagglutination.

Indications and Limitations

- If intestinal amebiasis is strongly suspected, multiple stool specimens (up to six) should be collected every other day until a diagnosis is made due to the intermittent shedding of the organism and the limited sensitivity of a single

stool specimen.

- Microscopic examination should ideally be performed on preserved specimens, otherwise *E. histolytica* trophozoites start to degrade and become undetectable within minutes of collection in unpreserved specimens leading to false negative results.
- Microscopic examination on its own is unable to distinguish between *E. histolytica* and morphologically identical non-pathogenic *Entamoeba* species frequently colonizing the gastrointestinal tract (including *E. dispar*, *E. moshkovskii*, and *E. bangladeshi*). Although some microscopic findings (e.g. hypertrophy or hematophagy) are more typically seen in *E. histolytica*, these findings have also been rarely reported in non-pathogenic species. Therefore, in gastrointestinal tract specimens, differentiation between these species requires antigen or molecular examination.
- Antigen or molecular examination should ideally be performed on unpreserved specimens, otherwise most preservatives (e.g. sodium acetate, acetic acid, and formalin [SAF]) interfere with antigenic or molecular detection leading to false negative results.
- Microscopic examination has low sensitivity for extraintestinal specimens, and the use of antigen or molecular examination methods for extraintestinal specimens has variable performance.
- Serology may remain positive for years after the resolution of clinical symptoms, and may not be able to distinguish active, resolved, or recurrent infection. Due to the high background seroprevalence in some regions, a positive serology has limited additional diagnostic utility for the diagnosis of intestinal amebiasis. Serology remains useful in cases of extraintestinal amebiasis due to the limited performance of other testing modalities on extraintestinal specimens. Of note, serology may be negative in the first one to two weeks of illness. Paired acute and convalescent sera may be useful to distinguish recurrent from resolved infection in patients who have likely acquired *E. histolytica* in the past.

For further information about human diagnostic testing, contact PHO's Laboratory Services at: https://www.publichealthontario.ca/en/Laboratory-Services/Laboratory-Contact.

Case Management

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.[3] Refer to Provincial Reporting Requirements above for relevant data to be collected during case investigation.

Advise probable cases of intestinal amebiasis who were only identified based on microscopic examination from a preserved specimen to submit an unpreserved stool specimen to PHO's laboratory as soon as feasible for differentiation between *E. histolytica* and non-pathogenic *Entamoeba* species before treatment is initiated.

Provide information on personal prevention measures and the prevention of secondary cases.

Exclusion

Symptomatic cases should be excluded from conducting activities in high-risk settings such as the food industry, healthcare, or daycare, for 24 hours after diarrhea resolves or for 48 hours after completion of treatment.

- 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 2017, or as current) for exclusion.[7]

Obtain contact information of all contacts for follow-up and contact management.

Provide infection control guidelines where applicable to operators of institutions or premises where cases and/or disease transmission is suspected.

Contact Management

Assess household and other contacts for symptoms and, if symptomatic, advise to seek medical care. Provide information about the spread of infection and how to prevent it. Refer symptomatic household members or sexual contacts for assessment by a physician. Management of symptomatic contacts is the same as for cases.

Outbreak Management

As with most enteric diseases, an outbreak is defined as the occurrence of two or more cases of enteric illness linked by time, common exposure or source and most often location.

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.[3]

Refer to Ontario's Foodborne Illness Outbreak Response Protocol (ON-FIORP) 2020 (or as current) for multi-jurisdictional foodborne outbreaks which require the response of more than two Partners (as defined in ON-FIORP) to carry out an investigation.[8]

Prevention and Control Measures

Personal Prevention Measures

- Thorough hand washing after using the washroom, sexual contact, and before preparing or eating food.
- Good hand hygiene is particularly important in institutional settings and for preventing transmission to household contacts.
- Sanitary disposal of fecal material.
- Adequate treatment of drinking water.
- Sexual transmission may be prevented by the use of personal protective

measures and avoidance of sexual practices that may facilitate fecal-oral transmission.

- Where water might be contaminated, travellers should ensure the water is safe for drinking, by boiling, chemical disinfection, and filtration.[6]

Infection Prevention and Control Strategies

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

Disease Characteristics

Aetiologic Agent – Amebiasis is caused by the amebic protozoan *Entamoeba histolytica* (*E. histolytica*). The organism is found in either a trophozoite form or a cyst form. The trophozoite is relatively fragile and dies rapidly when excreted from the body. The cyst, which is environmentally hardy, is the infective form. *E. histolytica* is morphologically identical by microscopic examination to the non-pathogenic *Entamoeba dispar (E. dispar)*, *Entamoeba moshkovskii* (*E. moshkovskii*), and *Entamoeba bangladeshi* (*E. bangladeshi*) species, therefore more specific examination methods (i.e. antigen or molecular testing) are required to differentiate between *E. histolytica* and the abovementioned non-pathogenic species colonizing the gastrointestinal tract. Both *E. histolytica* and these non-pathogenic *Entamoeba* species can be excreted as cysts or trophozoites in stool.[6]

Modes of Transmission - Mainly through ingestion of fecally-contaminated food or water containing amoebic cysts, which are relatively chlorine-resistant. Cysts can survive in moist environmental conditions for weeks to months. Transmission may occur sexually by fecal-oral contact with a chronically ill or asymptomatic cyst passer, or direct rectal inoculation through colonic irrigation devices.[5,6] During the acute phase of the illness, those infected tend to shed more trophozoites than cysts and pose relatively less risk of secondary transmission due to the fragility of trophozoites in the external and gastric environment.[5,9]

The infective dose in humans is reported to be fewer than 10 cysts.[9]

Incubation Period - A few days to several months or years; commonly 2 to 4 weeks.[5]

Period of Communicability - During the period that *E. histolytica* cysts are passed, which may continue for years.[5]

Reservoir - Humans; usually a chronically ill or asymptomatic cyst passer.[5]

Host Susceptibility and Resistance - Susceptibility to infection is general; those harbouring non-pathogenic *Entamoeba* species do not develop the disease; susceptibility to re-infection has been demonstrated but is apparently rare.[5]

Please refer to PHO's Infectious Disease Trends in Ontario (IDTO) interactive tool for the most up-to-date information on infectious disease trends in Ontario.[10]

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

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Document History

Revision Date	Document Section	Description of Revisions
April 2022	Entire Document	New template. Appendix A and B merged. No material content changes.
April 2022	Epidemiology: Occurrence section	Removed.
April 2022	ICD Codes	Removed.
August 2023	Case Definitions	Technical updates to confirmed case, probable case. Updated link in outbreak case definition section.
August 2023	Clinical Information	Technical updates and rewording to clinical evidence and clinical presentation.
August 2023	Laboratory Evidence	Technical updates and rewording to laboratory confirmation, invasive amebiasis and supportive laboratory evidence of infection,.
August 2023	Indications and Limitations	Technical updates and rewording.

Revision Date	Document Section	Description of Revisions
August 2023	Case Management	Technical updates.
August 2023	Disease Characteristics	Technical updates and rewording to aetiologic agent, modes of transmission and host susceptibility and resistance.
August 2023	Entire document	Updated hyperlinks.