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: Trichinosis

Effective: May 2022

Ontario

Trichinosis

☒ Communicable
☐ Virulent

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

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;[6]
- The iPHIS User Guides published by Public Health Ontario (PHO); and
- Bulletins and directives issued by PHO.

Type of Surveillance

Case-by-case

Case Definition

Confirmed Case

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

- Demonstration of *Trichinella* spp. in a muscle biopsy

OR

- Positive serology

Probable Case

Clinically compatible signs and symptoms in a person with an epidemiologic link to a laboratory-confirmed case or to a confirmed food source (e.g., meat known to contain *Trichinella* larvae, by visual inspection or laboratory confirmation).

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).

Clinical Information

Clinical Evidence

The disease has variable clinical manifestations and may be asymptomatic in some cases. Common signs and symptoms among symptomatic persons include eosinophilia, fever, myalgia, and periorbital edema.

Clinical Presentation

Clinical illness in humans is highly variable and can range from inapparent infection to a fulminating, fatal disease, depending on the number of larvae ingested.[1,2]

Gastrointestinal symptoms, which appear shortly after infection, include abdominal discomfort, nausea, vomiting, and diarrhea. As larvae migrate into tissues, fever, myalgia, periorbital edema, urticarial rash, eosinophilia, and conjunctival and

subungual hemorrhages may develop.[1,2]

Cardiac and neurological complications may develop and may be fatal if severe.[1]

Laboratory Evidence

Laboratory Confirmation

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

- Demonstration of *Trichinella* larvae in tissue obtained by muscle biopsy

OR

- Positive serologic test for *Trichinella*

Approved/Validated Tests

- Microscopic examination of muscle biopsy pressed between 2 glass plates for *Trichinella* larvae
- Microscopic examination of enzyme digested biopsy material for *Trichinella* larvae
- Serological tests (i.e., enzyme immunoassay [EIA])

Indications and Limitations

- Presence of larvae in biopsies indicates definitive evidence of infection but microscopy is time consuming, especially in a mild infection, and a negative result is not conclusive.
- Only serum samples are suitable for serology. During acute trichinosis, serologic tests may be negative due to prolonged seroconversion. Serum antibody titres rarely become positive before the second week of illness. Thus, convalescent serologic testing (~6-12 weeks following symptom onset) is recommended if acute serology is negative. Low reactive values on serologic assays may reflect: remote prior infection; false positivity due to cross-reactivity with other helminth infections; or, very low burden *Trichinella* infection.

- Skeletal muscle biopsy taken more than 10 days after infection (most often positive after the fourth or fifth week of infection) frequently provides conclusive evidence of infection.

For further information about human diagnostic testing, contact the Public Health Ontario Laboratories.

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

Provide education about the illness and how to prevent spread.

Specific treatment is under the direction of the attending health care provider. Treatment mainly involves administration of anthelmintics such as pyrantel, albendazole, or mebendazole which are effective in the intestinal stage and muscle-stage trichinosis.[1,4]

Albendazole is available through Health Canada's Special Access Program (SAP).

Additional information is available at: Guidance for Industry and Practitioners - Special Access Programme for Drugs Guidance Document (2022, or as current).[7]

Contact Management

None, unless exposed to the same source; not transmitted person-to-person.[2]

Outbreak Management

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.

Two or more cases linked in time to a common exposure is suggestive of an outbreak. Geographical clustering of cases will depend on the distribution of the implicated food product.

Prevention and Control Measures

Personal Prevention Measures

Preventive measures:[1,5]

- Educate food handlers, hunters, and the general public about proper food preparation in general and specifically about cooking pork and wild game thoroughly;
- All wild game meat, pork, pork products and horse meat should be cooked to an internal temperature of at least 71˚C. Curing (salting), drying, smoking or microwaving the meat does not consistently kill infective larvae;
- Properly clean and sanitize utensils including meat grinders, chopping boards, and knives after use;
- Do not feed garbage (swill) to swine; and
- Use only certified trichinae-free pork in raw pork products.

Infection Prevention and Control Strategies

For hospitalized cases, routine precautions are recommended.[2]

Refer to PHO's website to search for the most up-to-date information on Infection Prevention and Control (IPAC).

Disease Characteristics

Aetiologic Agent - Trichinosis is a foodborne parasitic infection caused by the intestinal roundworm (a nematode*), Trichinella* spp., whose larvae migrate to muscles and become encapsulated in muscle tissues.[1-3] There are many species of *Trichinella* capable of causing infection in mammals but in Canada, the most common species causing human infection include *Trichinella spiralis,*

Trichinella nativa, *Trichinella murrelli* and *Trichinella* genotype T6.[1,3,4]

Modes of Transmission - Eating raw or undercooked meat of animals containing the *Trichinella* larvae, in particular pork, pork products, and wild animal products.[1]

Incubation Period – Systemic symptoms usually appear about 8 – 15 days after ingestion of infected meat; this varies from 5 – 45 days, depending on the number of parasites involved. Gastrointestinal symptoms may appear within a few days.[1]

Period of Communicability - Not transmitted person-to-person; animal hosts may remain infective for months and meat from these animals remains infective until the larvae are killed by freezing, sufficient cooking, or irradiation.[1]

Reservoir - Swine, dogs, cats, horses, rats and many wild animals such as bear, wolves, foxes, wild boar, moose, polar bears, and marine mammals in the Artic.[1]

Host Susceptibility and Resistance - Susceptibility is universal; infection results in partial immunity.[1]

Please refer to PHO's Reportable Disease Trends in Ontario reporting tool for the most up-to-date information on infectious disease trends in Ontario.

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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Case Definition Sources

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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.