Appendix A: Disease-Specific Chapters

Chapter: Trichinosis

Revised December 2014
Trichinosis

☒ 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 Aetiological 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. There are many species of *Trichinella* capable of causing infection in mammals but in Canada, the most common species causing human infection include *T. nativa, T. murrelli* and *Trichinella* genotype T6.1,2,3

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; and
- Special attributes of cases (e.g., age, underlying conditions).

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

3.0 Identification

3.1 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
During the first week after ingesting infected meat, the person may be asymptomatic or experience abdominal discomfort, nausea, vomiting and or diarrhea. One to several weeks later, as larvae migrate into tissues, fever, myalgia, periorbital edema, urticarial rash, and conjunctival and subungual hemorrhages may develop.\(^1\)

Cardiac and neurological complications may appear in the third to sixth week.\(^1\)

### 3.2 Diagnosis

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

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.publichealhtontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/default.aspx

### 4.0 Epidemiology

#### 4.1 Occurrence

Worldwide, but variable in incidence depending in part on practices of eating and preparing pork or wild animal meat.\(^1\)

Several outbreaks have been reported in France and Italy due to infected horse meat.\(^1\)

Trichinosis is a rare disease in Ontario, with less than one reported case per year. Between 2007 and 2011, no cases of trichinosis were reported provincially.

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.\(^4,5\)

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

#### 4.2 Reservoir

Swine, dogs, cats, horses, rats and many wild animals such as bear, wolf, fox and wild boar.\(^1\)

#### 4.3 Modes of Transmission

Eating raw or undercooked meat of animals containing the *Trichinella* larvae, in particular pork, pork products and wild animal products.\(^1\)

#### 4.4 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.\(^1\)

#### 4.5 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 sufficient cooking or irradiation.\(^1\)
4.6 Host Susceptibility and Resistance
Susceptibility is universal; infection results in partial immunity.1

5.0 Reporting Requirements

5.1 To local Board of Health
Individuals who have or may have trichinosis shall be reported as soon as possible to the medical officer of health by persons required to do so under the Health Protection and Promotion Act, R.S.O. 1990 (HPPA).6

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 five (5) business days of receipt of initial notification as per iPHIS Bulletin Number 17: Timely Entry of Cases.7

The minimum data elements to be reported for each case is specified in the following sources:

- Ontario Regulation 569 (Reports) under the Health Protection and Promotion Act (HPPA),8,6
- 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
Preventive measures:

- Educate food handlers, hunters and the general public about proper food preparation in general and specifically about cooking pork and wild game thoroughly;
- Cook all pork and pork products to an internal temperature of 71° C;
- 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 trichinellae-free pork in raw pork products.

6.2 Infection Prevention and Control Strategies
For hospitalized cases, routine 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
6.3 Management of Cases

Investigate cases of trichinosis to determine the source of infection. Refer to Section 5: Reporting Requirements above for relevant data to be collected during case investigation. In addition to the requirements of HPPA Regulation 569 (Reports), the following disease-specific information should also be obtained during the incubation period:

- Date of symptom onset;
- History of out-of-province or international travel, including earliest and latest exposure dates;
- Food history including consumption of raw or undercooked meat; and
- History of similar illness in household members.

Provide education about the illness and how to prevent spread.

Specific treatment is under the direction of the attending health care provider. Albendazole or mebendazole are effective in the intestinal stage and muscle-stage trichinosis though antihelminthic treatment of muscle-stage trichinosis is supported by minimal clinical trial data. Albendazole is available through Health Canada’s Special Access Program (SAP): [http://www.hc-sc.gc.ca/dhp-mps/acces/drugs-drogues/index-eng.php](http://www.hc-sc.gc.ca/dhp-mps/acces/drugs-drogues/index-eng.php)

Additional information is available at:


6.4 Management of Contacts

None, unless exposed to the same source; not transmitted person to person.

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 to a common exposure is suggestive of an outbreak. Geographical clustering of cases will depend on the distribution of the implicated food product.

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;
• 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.

7.0 References


8.0 Additional Resources


9.0 Document History

Table 1: History of Revisions

<table>
<thead>
<tr>
<th>Revision Date</th>
<th>Document Section</th>
<th>Description of Revisions</th>
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<tbody>
<tr>
<td>December 2014</td>
<td>General</td>
<td>New template.</td>
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<tr>
<td></td>
<td></td>
<td>Title of Section 4.6 changed from “Susceptibility and Resistance” to “Host Susceptibility and Resistance”.</td>
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<td></td>
<td>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”.</td>
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<td>Section 9.0 Document History added.</td>
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<tr>
<td>December 2014</td>
<td>1.0 Aetiologic Agent</td>
<td>Change from “Trichinella spiralis (T. spiralis)” to “Trichinella spp”.</td>
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|               |                  | Change from “…encapsulated in muscles” to
<table>
<thead>
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<tbody>
<tr>
<td>December 2014</td>
<td>2.2 Outbreak Case Definition</td>
<td>Entire section revised.</td>
</tr>
<tr>
<td>December 2014</td>
<td>3.1 Clinical Presentation</td>
<td>Second paragraph: change from “Two to 8 weeks later…” to “One to several weeks later…”</td>
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</table>
| December 2014 | 3.2 Diagnosis                     | Paragraph removed: “Diagnosis is based on clinical presentation and epidemiological evidence and can be confirmed by blood tests and skeletal muscle biopsy. 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. Serum antibody titres rarely become positive before the second week of illness; testing paired acute and convalescent serum specimens usually is diagnostic.”  
Addition of direction to contact Public Health Ontario Laboratories or PHO website for additional information on human diagnostic testing. |
| December 2014 | 4.1 Occurrence                    | Third paragraph: removal of “Only two cases were reported between the years 2003-2007” and addition of “Between 2007 and 2011 no cases of trichinosis were reported provincially.”  
Addition of direction to refer to PHO’s Monthly Infectious Diseases Surveillance Reports. |
| December 2014 | 4.3 Modes of Transmission         | “Trichinella” italicized.  
End of paragraph: “…beef products” changed to “…wild animal products.” |
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<td>December 2014</td>
<td>4.4 Incubation Period</td>
<td>“GI” changed to “Gastrointestinal”.</td>
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<tr>
<td>December 2014</td>
<td>4.5 Period of Communicability</td>
<td>Removal of “freezing” from list of methods of killing larvae at end of paragraph.</td>
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<tr>
<td>December 2014</td>
<td>5.1 To Local Board of Health</td>
<td>Entire section revised.</td>
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| December 2014  | 5.2 To the Ministry of Health and Long-Term Care       | The following removed from the end of the first sentence: “to PHD”.  
Under the second paragraph the second bullet changed from: “The disease-specific User Guides published by the ministry” to “The iPHIS User Guides published by PHO”.  
Under the second paragraph the end of the last bullet changed from: “the ministry” to “PHO”.                                                                                                                                                                                                 |
| December 2014  | 6.3 Management of Cases                                | Entire section revised.                                                                                                                                                                                                                                                                                                                                     |
| December 2014  | 6.5 Management of Outbreaks                            | Second paragraph: addition of “Geographic clustering of cases will depend on the distribution of the implicated food product”.                                                                                                                                                                                                                               |
| December 2014  | 7.0 References                                        | Updated.                                                                                                                                                                                                                                                                                                                                                  |
| December 2014  | 8.0 Additional Resources                               | Updated.                                                                                                                                                                                                                                                                                                                                                  |