

Appendix A: Disease-Specific Chapters

Chapter: Trichinosis

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) Aetiologic Agent:	Trichinosis is a foodborne parasitic infection caused by the intestinal roundworm (a nematode), <i>Trichinella spiralis</i> (<i>T. spiralis</i>), whose larvae migrate to muscles and become encapsulated in muscles. There are many species of <i>Trichinella</i> capable of causing infection in mammals but the <i>T. spiralis</i> is the most common cause of human infection (1, 2).
2) Case Definition:	
Surveillance Case Definition	See Appendix B
Outbreak Case Definition	<p>The outbreak case definition varies with the outbreak under investigation. Consideration should be given to the following in establishing an outbreak case definition:</p> <ol style="list-style-type: none">1. Clinical, laboratory and/or epidemiological criteria;2. The time frame for occurrence;3. The geographic location(s) or place(s) where cases live or became ill/exposed, and4. Special attributes of cases (e.g. age, underlying conditions) and/or the aetiologic agent. <p>Cases may be classified by levels of probability (e.g. confirmed, probable and/or suspect).</p>
3) Identification:	
Clinical Presentation	<p>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).</p> <p>During the first week after ingesting infected meat, the person may be asymptomatic or experience abdominal discomfort, nausea, vomiting and or diarrhea. Two to 8 weeks later, as larvae migrate into tissues, fever, myalgia, periorbital edema, urticarial rash, and conjunctival and subungual hemorrhages may develop (3).</p>

	Cardiac and neurological complications may appear in the third to sixth week (1).
Diagnosis	<p>See Appendix B</p> <p>Diagnosis is based on clinical presentation and epidemiological evidence and can be confirmed by blood tests and skeletal muscle biopsy (1, 2). 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 (1). Serum antibody titres rarely become positive before the second week of illness; testing paired acute and convalescent serum specimens usually is diagnostic (2).</p> <p>Refer to the Ministry of Health Long Term care, Public Health Laboratory. Specimen Collection Guide, Testing Guidelines, June 2008.</p>

4) Epidemiology:

Occurrence	<p>Worldwide, but variable in incidence depending in part on practices of eating and preparing pork or wild animal meat (1).</p> <p>Several outbreaks have been reported in France and Italy due to infected horse meat (1).</p> <p>Trichinosis is a rare disease in Ontario, with less than one reported case per year. Only two cases were reported between the years 2003-2007.</p>
Reservoir	Swine, dogs, cats, horses, rats and many wild animals such as bear, wolf, fox and wild boar (1).
Modes of Transmission	Eating raw or undercooked meat of animals containing the <i>Trichinella</i> larvae, in particular pork, pork products and beef 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. GI 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 sufficient cooking, freezing or irradiation (1).
Susceptibility and Resistance	Susceptibility is universal; infection results in partial immunity (1).

5) Reporting Requirements:

To Local Board of Health	Confirmed and suspected cases shall be reported to the medical officer of health by persons required to do so under the <i>Health Protection and Promotion Act</i> , R.S.O. 1990.
To Public Health Division (PHD)	Report only case classifications specified in the case definition to

	<p>PHD 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 <i>iPHIS Bulletin</i> Number 17: Timely Entry of Cases (4).</p> <p>The minimum data elements to be reported for each case is specified in the following sources:</p> <ul style="list-style-type: none"> • <i>Ontario Regulation 569</i> (Reports) under the Health Protection and Promotion Act (HPPA); • The disease-specific User Guides published by the Ministry, and • Bulletins and directives issued by the Ministry.
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6) Prevention and Control Measures:

<p>Personal Prevention Measures</p>	<p>Preventive measures:</p> <ul style="list-style-type: none"> • 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 trichinae-free pork in raw pork products.
<p>Infection Prevention and Control Strategies</p>	<p>For hospitalized cases, routine precautions are recommended (3).</p>
<p>Management of Cases:</p>	<p>Investigate cases of trichinellosis to determine the source of infection. Refer to Section 5: <i>Reporting Requirements</i> above for relevant data to be collected during case investigation. The following disease-specific information should also be obtained during case management:</p> <ul style="list-style-type: none"> • Symptoms and 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. <p>Provide education about the illness and how to prevent spread.</p> <p>Specific treatment is under the direction of the attending health care provider. Albendazole or mebendazole are effective in the intestinal stage and the muscular stage. Corticosteroids are indicated only in severe cases to alleviate symptoms of inflammatory reaction when the CNS or heart is involved; however they delay elimination of adult worms from the intestine. In rare cases where infected meat is known to have been consumed, prompt administration of anthelmintic treatment may prevent development of symptoms (1).</p>

	<p>Albendazole is available through the Public Health Agency of Canada Special Access Program (SAP)</p> <p>Additional information is available at: Health Canada. Guidance document for industry and practitioners: special access programme for drugs. Ottawa: Health Canada; 2008. Available at http://www.hc-sc.gc.ca/dhp-mpps/alt_formats/hpfb-dgpsa/pdf/acces/sapq3_pasq3-eng.pdf (5)</p>
Management of Contacts	None, unless exposed to the same source; not transmitted person to person (2).
Management of Outbreaks	<p>Provide public health management of outbreaks or clusters in order to identify the source of illness, stop the outbreak and limit secondary spread.</p> <p>Two or more cases linked in time and place to a common exposure is suggestive of an outbreak.</p> <p>As per this Protocol, outbreak management shall comprise of but not limited to the following general steps:</p> <ul style="list-style-type: none"> • 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) References	<p>(1) Heymann D, editor. Control of communicable diseases manual. 18th ed. Washington: American Public Health Association; 2004.</p> <p>(2) Pickering LK, Baker CJ, Long SS, McMillan JA, editors. Red book: 2006 report of the Committee on Infectious Diseases. 27th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2006. Section 3, Summaries of infectious diseases; p. 671-3.</p> <p>(3) Notifiable Diseases On-Line [Internet]. Ottawa: Public Health Agency of Canada; 2003. Trichinosis; 2003 Dec 11 [cited 2009 Feb 12]. Available from http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/diseases/tric_e.html.</p> <p>(4) Ministry of Health and Long-Term Care. Timely entry of cases. <i>iPHIS Bulletin</i>. 2007 May 11;17.</p> <p>(5) Health Canada. Guidance document for industry and</p>

	<p>practitioners: special access programme for drugs. Ottawa: Health Canada; 2008. Available at http://www.hc-sc.gc.ca/dhp-mps/alt_formats/hpfb-dgpsa/pdf/acces/sapg3_pasg3-eng.pdf</p>
<p>8) Additional Resources</p>	<p>Ministry of Health Long Term-Care, Public Health Laboratories. Specimen collection guide: testing guidelines. Toronto: Queen's Printer for Ontario; 2008. Available from http://www.health.gov.on.ca/english/providers/pub/labs/specimen_guide/testing_guidelines.pdf.</p> <p>Gregg MB, editor. Field epidemiology. 2nd ed. New York: Oxford University Press; 2002.</p> <p>Ministry of Health and Long-Term Care. Food safety protocol. Toronto: Queen's Printer for Ontario; 2008. Available from http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/progstds/protocols/food_safety.pdf. (or as current)</p> <p><i>Health Protection and Promotion Act</i>, R.S.O. 1990, c. H.7. Available from http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90h07_e.htm.</p> <p>Ministry of Health and Long-Term Care. Infectious diseases protocol. Toronto: Queen's Printer for Ontario; 2009. Available from http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html (or as current)</p>

