

Appendix A: Disease-Specific Chapters

Chapter: Brucellosis

Brucellosis

- 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:	<p>Brucellosis is caused by the bacterium <i>Brucella</i>. <i>Brucella</i> species are small, nonmotile, gram-negative coccobacilli. The species that infect humans include <i>B. suis</i>, <i>B. abortus</i>, <i>B. melitensis</i>, and rarely <i>B. canis</i> (2).</p> <p>Brucellosis is a potential bioterrorism agent.</p>
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 when establishing an outbreak case definition:</p> <ol style="list-style-type: none">1. Clinical, laboratory and/or epidemiological criteria <p>Cases may be classified by levels of probability (e.g. confirmed, probable and/or suspect).</p>
3) Identification:	
Clinical Presentation	<p>Onset of symptoms may be acute or insidious; it is a systemic infection characterized by continued, intermittent or irregular fever, headache, weakness, sweating, chills, arthralgia, depression, weight loss or generalized aching. Localized infections of organs, including the liver and spleen may be present. Physical findings include lymphadenopathy, hepatosplenomegaly, and occasionally arthritis. Serious complications include meningitis, endocarditis and osteomyelitis (1, 2).</p>
Diagnosis	See Appendix B
4) Epidemiology:	
Occurrence	World wide, especially in Mediterranean countries, Middle East,

	<p>Africa, Asia, Central and South America, India and Mexico. The disease is often unrecognized and unreported (1).</p> <p>Predominantly an occupational disease of those who work with infected animals or their tissues, especially farm workers, veterinarians, meat inspectors, and abattoir workers. Infection is common in those who eat raw caribou. There have been reports of isolated cases of infection with <i>B. canis</i> occurring in animal handlers from contact with dogs.</p> <p>In Ontario, the number of brucellosis cases has remained stable over the years with an average of 4 reported cases per year from 2003 to 2007; most of which are related to travel.</p>
Reservoir	<p>Domestic animals such as cattle, swine, goats and sheep as well as wild animals such as caribou, bison, elk and some species of deer (1).</p> <p>Ontario has a Brucellosis free status for cattle.</p>
Modes of Transmission	<p>Transmission occurs through ingestion of raw milk and unpasteurized dairy products from infected animals, through direct contact of breaks in the skin and mucous membrane with infected animal tissue and their discharges and from fetuses and placentas. Airborne inhalation in laboratories and abattoirs has also been reported (1).</p>
Incubation Period	<p>The incubation period is variable, and difficult to ascertain; usually 5 - 60 days, commonly 1-2 months, occasionally several months (1).</p>
Period of Communicability	<p>There is no evidence of person to person communicability (1).</p>
Susceptibility and Resistance	<p>The severity and duration of the illness varies widely and the duration of acquired immunity following infection is uncertain (1).</p>

5) Reporting Requirements:

To local Board of Health	<p>Confirmed and suspected cases shall be reported immediately 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.</p>
To Public Health Division (PHD)	<p>Report only case classifications specified in the case definition to 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 (3).</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

	<p>Ministry, and</p> <ul style="list-style-type: none"> • Bulletins and directives issued by the Ministry.
6) Prevention and Control Measures:	
Personal Prevention Measures	<p>Preventative Measures:</p> <ul style="list-style-type: none"> • Travellers to foreign countries should be advised not to consume unpasteurized dairy products and undercooked meat products (1); • Farmers, hunters and animal handlers should be educated about the proper handling of carcasses (1) such as using protective clothing and gloves and when handling feral swine and to bury the remains, and • No one should consume raw unpasteurized milk and milk products from potentially infected cows, goats, and sheep or have direct contact with infected animal body fluids or products of conception.
Infection Prevention and Control Strategies	<p>For hospitalized cases, routine practices are recommended and contact precautions are indicated for people with draining wounds and or lesions (2).</p>
Management of Cases	<p>Investigate cases of brucellosis to determine the source of infection. Refer to Section 5: Reporting Requirement 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"> • History of exposure to possible sources based on specific species identified on culture (in past 60 days) • History of occupational risks (see above) • History of recent (international) travel • Food history • History of past infection as relapses of prior infection can occur <p>Notify Canadian Food Inspection Agency (CFIA) if disease is traced to imported or domestic animals. Test all suspect food samples or other incriminated products. Collaborate with CFIA to ensure proper removal/disposal of incriminated product or animal.</p> <p>Treatment is under the direction of the attending physician and depends on clinical symptoms and age of the case; antibiotics are usually prescribed for six weeks to prevent recurring infection (2).</p>
Management of Contacts	<p>Investigate contacts, such as co-workers and family members, to identify people who may have been exposed to the same source and who could also be infected (1).</p>
Management of Outbreaks	<p>Two or more cases linked in time and space is suggestive of an outbreak. If no common source is identified, consideration may be given to a Bioterrorism event where there is potential to infect humans and animals through aerosol exposure.</p>

	<p>Provide public health management of outbreaks or clusters in order to identify the source of illness, stop the outbreak.</p> <p>The occurrence of possible outbreaks of brucellosis is low given Ontario's brucellosis free status in cattle; however clusters of cases could possibly occur if exposed to an animal with brucellosis other than cattle, such as deer.</p> <p>In addition, as per this Protocol, outbreak management shall comprise of but not be 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 • Declare the outbreak over in collaboration with the outbreak team
<p>7) References</p>	<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. 236-7.</p> <p>(3) Ministry of Health and Long-Term Care. Timely entry of cases. iPHIS Bulletin. 2007 May 11;17.</p>
<p>8) Additional Resources</p>	<p>Notifiable Diseases On-Line [Internet]. Ottawa: Public Health Agency of Canada; 2003. Brucellosis; 2003 Dec 11 [cited 2009 Feb 12]. Available from http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/diseases/bruc_e.html.</p> <p>CHICA-Canada [Internet]. Winnipeg: Community and Hospital Infection Control Association—Canada; 2008 [cited 2009 Feb 12]. Available from http://www.chica.org/links_bioterrorism.html.</p> <p>Meat hygiene manual of procedures. Ottawa: Canadian Food Inspection Agency; 2008. Chapter 9, Emergency situations [cited 2009 Feb 8]. Available from http://www.inspection.gc.ca/english/fssa/meavia/man/ch9/table9e.shtml.</p>

Gregg MB, editor. *Field epidemiology*. 2nd ed. New York: Oxford University Press; 2002.

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)

Health Protection and Promotion Act, R.S.O. 1990, c. H.7. Available from http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90h07_e.htm.
