

# Appendix A: Disease-Specific Chapters

Chapter: Botulism

## Botulism

- 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**

<b>1) Aetiologic Agent:</b>	Botulism is caused by toxins, produced by <i>Clostridium botulinum</i> ( <i>C. botulinum</i> ), which is a Gram positive, spore-forming obligate anaerobic bacillus (1).
<b>2) Case Definition:</b>	
Surveillance Case Definition	<a href="#">See Appendix B</a>
Outbreak Case Definition	<p>A single case of botulism constitutes an outbreak and should be managed with great urgency.</p> <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"><li>1. Clinical, laboratory and/or epidemiological criteria</li><li>2. The time frame for occurrence</li><li>3. The geographic location(s) or place(s) where cases live or became ill/exposed</li><li>4. Special attributes of cases (e.g. age, underlying conditions) and/or the aetiologic agent</li></ol> <p>Cases may be classified by levels of probability (i.e. confirmed, probable and/or suspect).</p>
<b>3) Identification:</b>	
Clinical Presentation	<p>For information on clinical presentations in case investigations refer to the MOHLTC document <a href="#">"Botulism – Guide for Healthcare Professionals" (Version: May 14, 2008)</a>.</p> <p>There are 3 forms of botulism: foodborne (classic form), wound, and intestinal (infant and adult) botulism. The site of toxin production differs for each form, but all share the flaccid paralysis that results from <i>botulinum</i> neurotoxin (1).</p> <p>Foodborne botulism is a severe intoxication resulting from ingestion</p>

	<p>of preformed toxin present in contaminated food. The usual first signs and symptoms include fatigue, weakness and vertigo, followed by blurred or double vision, dysphasia and dry mouth. Vomiting, diarrhoea, constipation and abdominal swelling may occur. Acute bilateral cranial nerve impairment and descending weakness or paralysis characterize the illness. Recovery may take months; the case fatality rate in the USA is 5%-10% (1).</p> <p>Wound botulism occurs when spores get into an open wound and reproduce in an anaerobic environment. Symptoms are similar to food borne botulism but may take up to 2 weeks to appear (1).</p> <p>Intestinal (infant and adult) botulism is rare; it occurs following spore ingestion, subsequent outgrowth and in-vivo toxin production in the intestine; it affects children under 1 year but can rarely affect adults who have altered GI anatomy and microflora (1). Clinical symptoms in infants include constipation, loss of appetite, weakness, lethargy, and altered cry, and a striking loss of head control known as “floppy head” (1).</p>
<p>Diagnosis</p>	<p><a href="#">See Appendix B</a></p> <p>Diagnosis of food borne botulism is made by demonstration of <i>botulinum</i> toxin in serum, stool, gastric aspirate or incriminated food; or through culture of <i>C. botulism</i> from gastric aspirate or stool in a clinical case (1).</p> <p>Identification of organisms in suspected food is helpful but not diagnostic because botulism spores are ubiquitous. The diagnosis may be accepted in a person with the clinical syndrome who had consumed food incriminated in a laboratory-confirmed case (1).</p> <p>Diagnosis is made in collaboration with the National Botulism Reference Laboratory in Ottawa. The Botulism Reference Service office can be reached during working hours at 613-957-0902 or after-hours at 613-296-1139.</p> <p>Also refer to the MOHLTC document “<a href="#">Botulism – Guide for Healthcare Professionals</a>” (Version: May 14, 2008)</p>
<p><b>4) Epidemiology:</b></p>	
<p>Occurrence</p>	<p>Botulism is a rare disease in Ontario with less than twenty cases reported over the last five years. Given the severity and rarity of botulism, one case of botulism constitutes an outbreak.</p> <p>Worldwide; sporadic cases, family and general outbreaks occur when food is prepared or preserved by methods that do not destroy spores and permit toxin formation (1). Cases rarely result from contaminated commercially processed products; however, outbreaks have occurred from contamination through cans damaged after processing (1).</p>

Reservoir	<i>Botulinum</i> spores are ubiquitous in soil worldwide; are frequently recovered from agricultural products, including honey, and are also found in marine sediments and in the intestinal tract of animals, including fish (1).
Modes of Transmission	<p>Foodborne botulism is transmitted by the ingestion of improperly prepared, stored or cooked food containing the toxin. The foods most often implicated are canned foods (vegetables and fruits), home preserved foods, smoked fish, seal meat and other arctic marine mammals such as whale meat.</p> <p>Wound botulism results from contamination of traumatized tissue by <i>C. botulinum</i> found in soil that grows in the wound and produces toxin (1).</p> <p>Intestinal (infant and adult) botulism is typically associated with the ingestion of spores that germinate and produce toxin in-vivo that may be present in items such as foods, soil, dust, unpasteurized honey and peanut butter.</p>
Incubation Period	<p>In food borne botulism neurological symptoms usually appear within 12 to 36 hours after ingestion of contaminated food, or up to several days after eating contaminated food. The shorter the incubation period, the more severe the disease and the higher the case-fatality rate (1).</p> <p>For wound botulism, symptoms may take up to 2 weeks to appear after infection (1), with an average of about 10 days.</p> <p>The incubation period of intestinal botulism in infants is unknown since the precise time of ingestion often cannot be determined (1).</p>
Period of Communicability	<p>No instance of secondary person to person transmission has been documented despite excretion of <i>C. botulinum</i> toxin and organisms in the feces of intestinal (infant) and food borne botulism cases (1).</p> <p>People with food borne botulism typically excrete the toxin for shorter periods (1).</p>
Susceptibility and Resistance	Susceptibility is general. Adults with special bowel problems leading to unusual gastrointestinal flora (or with a flora unintentionally altered by antibiotic treatment for other purposes) may be susceptible to intestinal botulism (1).

### 5) Reporting Requirements:

To local Board of Health	Confirmed and suspected cases shall be reported <b>immediately by phone</b> 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)	The board of health shall notify the PHD <b>immediately by phone</b> upon receiving a report of a confirmed, probable or suspect case.

	<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 <b>within one (1) business days of receipt of initial notification</b> as per <i>iPHIS Bulletin</i> Number 17: Timely Entry of Cases (2).</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"> <li>• <i>Ontario Regulation 569</i> (Reports) under the Health Protection and Promotion Act (HPPA);</li> <li>• The disease-specific User Guides published by the Ministry, and</li> <li>• Bulletins and directives issued by the Ministry.</li> </ul>
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## 6) Prevention and Control Measures:

<p>Personal Prevention Measures</p>	<p>Preventive measures (3):</p> <ul style="list-style-type: none"> <li>• Practice safe food preparation and canning processes</li> <li>• Cover wounds to avoid contamination with soil or non-sterile substances</li> <li>• Abstain from feeding unpasteurized honey and peanut butter to infants less than one year of age</li> <li>• Effective protocols should be in place for canned food products that have a higher PH and there should always be adequate refrigeration and storage of incompletely processed foods</li> </ul>
<p>Infection Prevention and Control Strategies</p>	<p>Routine practices are recommended for hospitalized cases.</p>
<p>Management of Cases</p>	<p>Investigate cases and suspected exposures in collaboration with the attending physician, PHD, MOHLTC, as well as with the Public Health Agency of Canada (PHAC). Decision to notify the Canadian Food Inspection Agency (CFIA) if appropriate will be made in collaboration with the PHD and PHAC as well as decisions for any other communication and or notification that are required.</p> <p>Refer to the MOHLTC document <a href="#">"Botulism – Guide for Healthcare Professionals" (Version: May 14, 2008)</a> for steps to be taken in case investigations including:</p> <ul style="list-style-type: none"> <li>• Symptoms and date of symptom onset</li> <li>• History of out-of-province or international travel</li> <li>• 2-3 day food history and history of other risk behaviours or exposures</li> <li>• Earliest and latest exposure dates</li> </ul> <p>Exposure investigation should include but not be limited to:</p> <ul style="list-style-type: none"> <li>• The collection of food histories 2-3 days prior to symptom onset</li> </ul>

	<ul style="list-style-type: none"> <li>The collection of food samples of suspected sources of infection for laboratory analysis using appropriate media, sampling techniques and routine practices for the handling of suspect food</li> </ul> <p><b>Treatment:</b></p> <p>Immediate medical treatment is required; do not await laboratory confirmation. Botulism antitoxin can be accessed through the Ministry of Health and Long Term Care (MOHLTC).</p> <p>Refer to the MOHLTC document <a href="#">"Botulism – Guide for Healthcare Professionals" (Version: May 14, 2008)</a></p>
Management of Contacts	<p>People who are known to have eaten contaminated food or who have shared a likely exposure should be advised to consult with their health care provider for assessment and/or treatment. Treatment may include purging with cathartics, gastric lavage and high enemas (1).</p>
Management of Outbreaks	<p><b>A single case of botulism should be considered an outbreak and should be managed with great urgency</b> in collaboration with the attending physician, PHD-MOHLTC, PHAC and the Botulism Reference Laboratory. In collaboration with PHD and PHAC, determine what if any communication and or notification are required, to whom and how often, including CFIA where appropriate.</p> <p>The local public health unit should consider the following minimum outbreak control measures:</p> <ul style="list-style-type: none"> <li>Active finding of cases and persons exposed to the same source(s) of infection</li> <li>Alerts for medical community and hospitals</li> <li>Public information and communication plans</li> <li>Recall of the suspect food</li> </ul> <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"> <li>Confirm diagnosis and verify the outbreak</li> <li>Establish an outbreak team</li> <li>Develop an outbreak case definition</li> <li>Implement prevention and control measures</li> <li>Implement and tailor communication and notification plans depending on the scope of the outbreak</li> <li>Conduct epidemiological analysis on data collected</li> <li>Conduct environmental inspections of implicated premise where applicable</li> <li>Coordinate and collect appropriate clinical specimens where applicable</li> <li>Prepare a written report</li> <li>Declare the outbreak over in collaboration with the outbreak team</li> </ul>

<p><b>7) References</b></p>	<p>(1) Heymann D, editor. Control of communicable diseases manual. 18th ed. Washington: American Public Health Association; 2004.</p> <p>(2) Ministry of Health and Long-Term Care. Timely entry of cases. iPHIS Bulletin. 2007 May 11;17.</p> <p>(3) 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. 257-60.</p>
<p><b>8) Additional Resources</b></p>	<p>Austin J, Dodds K. Botulism Reference Service for Canada. Can Commun Dis Rep. 1996 Nov 1;22(21):183-4. Available from <a href="http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/96vol22/dr2221e.html">http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/96vol22/dr2221e.html</a>.</p> <p>Austin J, Blanchfield B, Ashton E, Lorange M, Proulx JF, Trinidad A, Winther W. Botulism in Canada--summary for 1997. Can Commun Dis Rep. 1999 Jul 15;25(14):121-2. Available from <a href="http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/99vol25/dr2514ea.html">http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/99vol25/dr2514ea.html</a></p> <p>Ministry of Health and Long-Term Care. Infectious diseases protocol. Toronto: Queen's Printer for Ontario; 2009. Available from <a href="http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html">http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html</a> (or as current)</p> <p>Division of Foodborne, Bacterial and Mycotic Diseases [Internet]. Atlanta: Centers for Disease Control and Prevention; 2009. Disease listing: botulism general information; 2008 May 21 [cited 2008 Feb 2]. Available from <a href="http://www.cdc.gov/nczved/dfbmd/disease_listing/botulism_gi.html">http://www.cdc.gov/nczved/dfbmd/disease_listing/botulism_gi.html</a>.</p> <p>Cox N, Hinkle R. Infant botulism. Am Fam Physician. 2002 Apr 1;65(7):1388-92. Available from <a href="http://www.aafp.org/afp/20020401/1388.html">http://www.aafp.org/afp/20020401/1388.html</a>.</p> <p>Ministry of Health and Long-Term Care. Botulism: guide for healthcare professionals. Toronto: Queen's Printer for Ontario; 2008. Available from <a href="http://www.health.gov.on.ca/english/providers/pub/disease/factsheet/hcp_botulism.pdf">http://www.health.gov.on.ca/english/providers/pub/disease/factsheet/hcp_botulism.pdf</a>.</p> <p>Gregg MB, editor. Field epidemiology. 2nd ed. New York: Oxford University Press; 2002.</p> <p><i>Health Protection and Promotion Act</i>, R.S.O. 1990, c. H.7. Available from <a href="http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90h07_e.htm">http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90h07_e.htm</a>.</p>

