

# Appendix A: Disease-Specific Chapters

Chapter: Anthrax

## Anthrax

- 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>	<p>The aetiological agent of anthrax is the bacterium <i>Bacillus anthracis</i> (<i>B. anthracis</i>), an aerobic, Gram-positive, encapsulated, spore forming, nonmotile rod (1).</p> <p><i>B. anthracis</i> is a potential bioterrorist agent.</p>
<b>2) Case Definition:</b>	
Surveillance Case Definition	<a href="#">See Appendix B</a>
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"><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 aetiologic agent)</li></ol> <p>Cases may be classified by levels of probability (e.g. confirmed, probable or suspect).</p>
<b>3) Identification:</b>	
Clinical Presentation	<p>Depending on the route of transmission of infection, anthrax disease can result in four clinical syndromes: cutaneous, inhalation, intestinal and oropharyngeal (2).</p> <p>Cutaneous anthrax is characterized by initial itching of exposed skin surface; an initial vesicle at the site of inoculation develops into a painless black eschar; fever, malaise and headache may be present.</p> <p>Inhalational anthrax is the most lethal form of disease. Initial presentation includes, sweats, malaise, mild cough, dyspnea, nausea or vomiting, and this is followed by acute onset of respiratory distress</p>

	<p>and shock; there is also radiological evidence of mediastinal widening and pleural effusion present. Fatality rate is extremely high. Anthrax meningitis begins with hypotension, quickly followed by delirium or coma; refractory seizures, cranial nerve palsies, and myoclonus have been reported.</p> <p>Intestinal anthrax presents in acute vomiting, abdominal distension, GI bleeding, and peritonitis.</p> <p>Symptoms of oropharyngeal anthrax include fever, neck swelling due to lymphadenopathy, throat pain, oral ulcers and sepsis.</p>
--	---

Diagnosis	<p><a href="#">See Appendix B</a></p> <p>Laboratory demonstration of <i>B. anthracis</i> obtained from blood, CSF, pleural fluid, ascitic fluid, vesicular fluid or lesion exudate (1).</p>
-----------	---

#### 4) Epidemiology:

Occurrence	<p>Anthrax is primarily a disease of herbivores; humans and carnivores are incidental hosts. In most industrialized countries anthrax is an infrequent and sporadic human infection (1). Anthrax has not been reported in Ontario. Given the severity and rarity of Anthrax, a single confirmed case constitutes an outbreak.</p>
Reservoir	<p>The main reservoirs of anthrax are animals both livestock and wildlife, as well as soil where the spores may remain dormant for years and are a potential source of infection for grazing livestock (1).</p>
Modes of Transmission	<p>Transmission occurs by inoculation through open skin via contact with infected animal tissue, other animal products and contaminated soil and by ingestion of undercooked, contaminated or raw meat (2). Inhalation anthrax results from the inhalation of anthrax spores, particularly in risky industrial settings (1).</p>
Incubation Period	<p>From 1-7 days, although incubation periods of up to 60 days are possible (1).</p>
Period of Communicability	<p>Person to person transmission is rare. Articles and soil contaminated with spores may remain infective for years (1).</p>
Susceptibility and Resistance	<p>There is some evidence of in-apparent infection among people in frequent contact with the infectious agent; second attacks can occur, but reports are rare (1).</p>

#### 5) Reporting Requirements:

To local Board of Health	<p>Confirmed and suspected cases should be reported <b>immediately</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.</p>
To Public Health Division (PHD)	<p>The board of health shall notify the PHD of the MOHLTC <b>immediately by phone</b> upon receiving a report of a confirmed,</p>

	<p>probable or suspect case of anthrax.</p> <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 five (5) business days of receipt of initial notification</b> 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"> <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>
--	---

## 6) Prevention and Control Measures:

<p>Personal Prevention Measures</p>	<p>Preventive measures include but are not limited to:</p> <ul style="list-style-type: none"> <li>• Education about the modes of transmission, care of skin abrasions, and hand washing to members of the public visiting areas where anthrax is known to exist</li> <li>• Education regarding the importance of hand washing after touching animals in petting zoos, on farms, etc.</li> <li>• Controlling the disease in animals at risk through maintenance of active immunization and treatment of active animal cases</li> <li>• Immunize high risk persons such as laboratory workers and animal handlers where indicated</li> <li>• Use of proper ventilation in hazardous industries and the use of protective clothing where indicated</li> <li>• Avoid contact with any powder substance if bioterrorism is suspected</li> </ul>
<p>Infection Prevention and Control Strategies</p>	<p>Strategies:</p> <ul style="list-style-type: none"> <li>• For hospitalized persons routine practices are recommended and the use of contact precautions for cases with open lesions (2)</li> <li>• Controlling the disease in animals at risk through maintenance of active immunization and treatment of active animal cases</li> </ul>
<p>Management of Cases</p>	<p><b>One case is deemed a public health emergency.</b></p> <p>Case Investigation and follow-up will be done in consultation with the Public Health Division, MOHLTC and the Public Health Agency of Canada.</p> <p>Management of cases should also include contacting the Canadian Food Inspection Agency (CFIA).</p>

---

Epidemiological investigation:

Investigate cases of anthrax to determine the source of infection and whether other cases may have been exposed to any identified source. Refer to Section 5: *Reporting Requirements* above for relevant data to be collected during case investigation. The following diseases-specific information should also be obtained during case management:

- Symptoms and date of symptom onset
- History of out-of-province and international travel
- History of exposure including contact with ruminants that have died acutely
- Earliest and latest exposure dates
- Occupation

Exposure investigation: In collaboration with the PHD:

- Determine what samples of suspected sources to collect for laboratory analysis
- Determine appropriate sampling medium and techniques;
- Inspect premises associated with illness

Provide information related to anthrax, including information on transmission and on risk factors.

Persons who may have been exposed to anthrax are not contagious, so quarantine is not appropriate. Persons with draining lesions should be cared for using contact precautions. Dressings with drainage from the lesions should be incinerated, autoclaved, or otherwise disposed of as biohazard waste.

Treatment of the case should be under the direction of an infectious disease physician. Refer to the resources and references listed below for more information on treatment.

In collaboration with the PHD, determine what communication and notification is required about the case.

**NOTE:**

Given the potential for the appearance of these cases to signal a bioterror incident, investigation and follow-up may involve the activation of the emergency management system in place in the province, including the Emergency Management Unit of the Ministry of Health and Long-Term Care and relevant health emergency response plans, as well as those additional ministries with responsibilities for security, law enforcement, or other relevant areas of concern, as identified in the Emergency Management and Civil Protection Act and associated Order in Council. Please see the following link for further information. The Ministry Emergency Response Plan (MERP) provides information on how the ministry would respond to an emergency. Please see the following link for further information:

[http://www.health.gov.on.ca/english/providers/program/emu/emerg\\_p](http://www.health.gov.on.ca/english/providers/program/emu/emerg_p)

	<a href="http://rep/emerg_resp_plan.html">rep/emerg_resp_plan.html</a>
Management of Contacts	Although there is no person to person transmission, there could be a possibility of exposure to same source; consultation with infectious disease experts may be prudent.
Management of Outbreaks	<p>A single case of anthrax should be managed with great urgency. If there is suspicion of a bioterrorism event, notify Emergency Management Ontario. Consider the following outbreak control measures:</p> <ul style="list-style-type: none"> <li>• Coordination with appropriate emergency services (e.g. Emergency Management Ontario and the police force)</li> <li>• Active finding of cases and persons exposed to the same source of infection</li> <li>• Alerts for medical community and hospitals</li> <li>• Public information and communication plans</li> <li>• Control of contacts including field workers involved in the implementation of environmental control measures</li> <li>• Environmental control measures</li> </ul> <p>As well as collaboration with CFIA, the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) should also be involved.</p> <p>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>
<b>7) References</b>	<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. 208-11.</p> <p>(3) Ministry of Health and Long-Term Care. Timely entry of cases. <i>iPHIS Bulletin</i>. 2007 May 11;17.</p>

## 8) Additional Resources

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](http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html) (or as current)

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](http://www.chica.org/links_bioterrorism.html).

Ministry of Health and Long-Term Care, Emergency Management Unit. Ministry emergency response plan (MERP). Toronto: Queen's Printer for Ontario; 2007. Available from [http://www.health.gov.on.ca/english/providers/program/emu/emerg\\_rep/emerg/emerg\\_resp\\_plan.pdf](http://www.health.gov.on.ca/english/providers/program/emu/emerg_rep/emerg/emerg_resp_plan.pdf)

Public Health Agency of Canada. Anthrax (historical cases): Canada. Infectious Diseases News Brief. 2001 Dec 7. Available from [http://www.phac-aspc.gc.ca/bid-bmi/dsd-dsm/nb-ab/2001/nb4901\\_e.html](http://www.phac-aspc.gc.ca/bid-bmi/dsd-dsm/nb-ab/2001/nb4901_e.html).

Material Safety Data Sheets (MSDS) for infectious substances [Internet]. Ottawa: Public Health Agency of Canada; 2006. Bacillus anthracis; 2001 Jan 23 [cited 2007 Feb 7]. Available from <http://www.phac-aspc.gc.ca/msds-ftss/msds12e.html>.

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>.

National Advisory Committee on Immunization. Canadian immunization guide. 7<sup>th</sup> ed. Ottawa: Public Health Agency of Canada; 2006. Available from: <http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php>.

Case definitions for diseases under national surveillance: addition of diseases associated with potential bioterrorist agents. Can Commun Dis Rep. 2002 Nov 1;28(21):173-8. Available from <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/02vol28/dr2821ea.html>.

CDC Emergency Preparedness and Response Site [Internet]. Atlanta: Centres for Disease Control and Prevention; 2009 [cited 2009 Feb 11]. Available from <http://www.bt.cdc.gov>.

*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](http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90h07_e.htm).

