

6.2 Anthrax

<http://www.phac-aspc.gc.ca/ep-mu/anthrax-eng.php>

Case Definition

Confirmed Case

Laboratory confirmation of infection:

- isolation of *Bacillus anthracis* from blood, lesions, or discharge (tier 3 laboratory only)

OR

- demonstration of *Bacillus anthracis* in blood, lesions, or discharge by immunofluorescence

Probable Case

Clinical illness, as described below, in a person who is epidemiologically linked to a laboratory-confirmed item/event of *Bacillus anthracis*, or to a probable infected item/event.

Suspected Case

Clinical illness, as described below, in a person who is not epidemiologically linked to a laboratory-confirmed or probable item/event infected with *Bacillus anthracis*.

Clinical Presentation

Anthrax is a disease of herbivores that is incidental in humans. Infection is generally associated with occupational exposure. Case fatality can be between 5-20% but is almost nullified with appropriate treatment. Three forms of anthrax infection have been identified. Though caused by the same agent they are named based on route of entry.

- Cutaneous Anthrax: Occurs when the agent enters a pre-existent cut or abrasion. The infected area becomes raised and itchy. The site becomes liquid filled and ruptures to produce a painless ulcer with a characteristic black necrotic center. A patient is likely to exhibit marked edema caused by *Bacillus anthracis* toxins. Local lymph nodes may also swell. If left untreated death can occur from systemic infection, or respiratory distress from cervical and thoracic edema.
- Gastrointestinal Anthrax: Generally occurs after consumption of meats from contaminated animals but may also come from food otherwise contaminated with *Bacillus anthracis*. Acute inflammation of the intestinal tract is characteristic. Initial symptoms may include nausea, loss of appetite, vomiting, and fever. Abdominal pain, vomiting of blood and severe diarrhea may follow. Case fatality may be 20-60% if left untreated.
- Inhalation Anthrax: Occurs through the inhalations of anthrax spores. Onset is slow beginning with non-specific symptoms of malaise, fatigue, coughing,

mild chest discomfort. Initial symptoms are followed by an improvement that can be as long as several days or as short as several hours. This is followed by an abrupt decline with severe respiratory distress, dyspnea, diaphoresis, stridor, and cyanosis. X-rays show a characteristic widened mediastinum with pleural effusion likely without infiltrates. Shock occurs within 24-36 hours of onset. Case fatality is close to 100% in late stage, despite treatment. This high case fatality makes this the most serious form for bioterrorism purposes.

Epidemiology

Occurrence

While anthrax is not present in North America, it is endemic in other agricultural areas of the world though, especially where animals or bone products are used. It is associated with contact, generally occupational, with infected herbivorous animals. Humans are an incidental host for anthrax.

Bioterrorism exposure is most likely through inhalations of *Bacillus anthracis* spores. The agent has been aerosolized in the past by burning. The only recent use of anthrax for bioterrorism was in 2001 when it was mailed to various high profile media and political targets, killing 5 people.

The most recent case of anthrax in North America was 1976 in the United States

Reservoir

The reservoir for this virus is herbivorous animals.

Transmission

World-wide, anthrax generally occurs from exposure to infected animals. Infection can occur through cuts, ingestion, or inhalation. Each different route of infection causes a different clinical manifestation of illness. Bioterrorism use employed physical dispersal, producing cutaneous and inhalation infections. Human to human transmission is very rare.

Incubation Period

The incubation period is usually 1-7 days after exposure. Periods as long as 43 days have been recorded.

Period of Communicability

Person to person transmission is extremely rare. Spores, in articles or soil, can remain contaminated for years.

Diagnosis

This is consistent with the above listed case definition.

Control Measures

Management of Case

Even a single case of inhalation anthrax, especially in an urban centre, warrants investigation. The case should undergo disinfection of articles, such as clothing, that may have come in contact with the source. Steam sterilization or burning is required to destroy spores **. Antibiotic treatment is effective and ciprofloxacin should be the first drug used, though combinations of drugs should be used for inhalation anthrax. Corticosteroids have also been used to effect when treating symptoms of inhalation anthrax.

Management of Contacts

Person to person transmission is very rare. However, contact with cutaneous anthrax effluence or spores from articles of cases could create infection in contacts. In this case prophylactic antibiotic use can be administered.

Management of Outbreaks

General anthrax outbreaks are associated with occupational exposure. Disinfection of the area, equipment, and personal articles should occur**. Proper ventilation in the facility is essential.

A single case of inhalation anthrax should result in investigation. Notification of one case would result in a national response. The response to an outbreak would involve deployment of an expert team from Health Canada's Center for Emergency Preparedness and Response Division. Further health direction would come from this team. Other criminal investigation authorities should also be notified and included in planning.

When deliberate use is suspected than specific measures should be taken as directed by the Newfoundland and Labrador Bioterrorism Response Handbook.

Preventive Measures

Because of widespread susceptibility and a lack of person-to-person transmission prevention initiatives are minimal. Occupational exposure can be reduced through education, proper ventilation, immunizing high-risk workers, and disinfecting suspect animal feed and excrement.

Reporting Requirements

Regional MOH will notify

- Local physicians, nurse practitioners, communicable disease control nurses (CDCNs) and infection control nurses (ICN) in the particular region.
- Provincial office of the CMOH as per list A

Provincial Public Health is responsible for

- Reporting the data related to the disease to PHAC and other regions.
- Analysis of cases and reporting in the Communicable Disease Report (CDR)