Botulism Reference Service for Canada.

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Botulism Reference Service for Canada

- Established at the Health Protection Branch (now Health Products and Food Branch) in Ottawa in 1974.
- Receive and analyze samples from all provinces and territories (except BC).
- Assist physicians and provincial departments of health when botulism is suspected.
- Examine suspect foods and clinical specimens submitted for analysis.
- Rapidly alert responsible agencies when commercial foods are involved.
- Maintain reference cultures of Clostridium botulinum.
**Clostridium botulinum**

- Gram positive, spore forming, anaerobic rod.
- Produces botulinum neurotoxin – 1µg = adult lethal dose
- 7 serotypes (A to G) of neurotoxin
  - A, B, E and F cause human illness
- Foodborne botulism
  - Ingestion of food containing pre-formed neurotoxin
  - 3% case fatality rate in Canada (down from 46% in 1960’s)
Botulinum neurotoxin is the most toxic substance known

Lethal dose is 0.1ng / kg

10 ng is lethal to a 100 kg person

Mouse bioassay can detect 10 pg of botulinum neurotoxin in a 0.5ml sample
Four Types of Botulism

- Foodborne botulism
  - Ingestion of food containing pre-formed neurotoxin
  - 3% case fatality rate in Canada (down from 46% in 1960's)
  - 6 cases in Canada in 2007; 9 cases in 2008; 6 cases in 2009
  - 32 cases in U.S. in 2007

- Infant botulism
  - Intestinal colonization
  - Neurotoxin is produced in the intestine
  - 6 cases in Canada in 2007; 3 cases in 2008; 2 cases in 2009
  - Most common type of botulism in US - 85 cases in U.S. in 2007

- Wound botulism
  - Wound infection – usually illicit drug injection
  - Never reported in Canada
  - Most common type in UK
    - average 16 cases per year from 2000 to 2007 in England and Wales
  - 27 cases in U.S. in 2007

- Intestinal infection in adults
  - Etiology similar to infant botulism
  - Very rare (misdiagnosed?), Crohn’s disease, previous bowel surgery, long term antimicrobial therapy may be predisposing factors
  - 2 cases in Canada in 2006; 3 cases in 2007; 2 cases in 2008
Symptoms – Foodborne botulism

- Onset usually in 12 – 36h.
- Nausea, vomiting and diarrhea initially.
- Descending, symmetrical, flaccid paralysis.
  - Ptosis, blurred vision, diplopia, dilated and fixed pupils.
  - Dysphagia, dysphonia, dry mouth.
  - Constipation, death by asphyxiation.
- Confused with Guillan-Barre syndrome, stroke, myasthenia gravis.
Confirmed Case of Foodborne Botulism

Laboratory confirmation of intoxication with clinical evidence:

- detection of botulinum toxin in serum, stool, gastric aspirate or food
- isolation of *C. botulinum* from stool or gastric aspirate

Trends in Total Foodborne Botulism Cases and Fatality Rates

- Total number has increased.
- Recognition of less severe cases that may have gone unreported in the past?
- Fatal cases and fatality rate have decreased.
- Decrease in fatal cases can be attributed to rapid diagnosis and treatment, administration of antitoxin and respiratory support.

<table>
<thead>
<tr>
<th>Decade</th>
<th>Total cases (per decade)</th>
<th>Fatal cases (per decade)</th>
<th>Fatality rate (%)</th>
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<tbody>
<tr>
<td>1950's</td>
<td>40</td>
<td>10</td>
<td>25</td>
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<tr>
<td>1960's</td>
<td>60</td>
<td>20</td>
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<td>1970's</td>
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Symptoms – Infant botulism

- Occurs in otherwise healthy children < 1 year old
- Not as obvious as foodborne botulism
  - In mild cases, physical signs may be subtle and easily overlooked
- Constipation – usually first symptom
- Generalized weakness, weak cry, poor sucking, lethargy, lack of facial expression, poor head control
- Ptosis and dilated pupils occur later

Infant Botulism Treatment and Prevention Program
- California Dept. of Public Health
- Infantbotulism.org
- BabyBIG is available for treatment
  - BIG = Botulinum Immune Globulin
Causes of Infant Botulism

- Caused by ingestion of spores and subsequent colonization of the colon
- Intestinal toxaemia: botulinum neurotoxin is produced in the infant’s colon
- Sources of spores: environmental dust, honey, powdered infant formula (UK)
Confirmed Case of Infant Botulism

Laboratory confirmation with symptoms compatible with botulism in a person less than one year of age

- detection of botulinum toxin in stool or serum
  or
- isolation of *C. botulinum* from the patient’s stool, or at autopsy

Botulism – Guide for Healthcare Professionals

Includes information on obtaining anti-toxin

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This fact sheet provides basic information only. It must not take the place of medical advice, diagnosis or treatment. Always talk to a health care professional about any health concerns you have, and before you make any changes to your diet, lifestyle or treatment.

Botulism

This information requires knowledgeable interpretation and is intended primarily for use by healthcare workers and facilities/organizations providing healthcare including pharmacies, hospitals, long-term care facilities, community-based healthcare service providers and pre-hospital emergency services.

Botulism is a neuroparalytic disease caused by a nerve toxin that is produced by the bacterium Clostridium botulinum. There are three main kinds of botulism: Foodborne, Wound and Intestinal (infant and adult).

Important Numbers (see page 2 for hours of operation)

- Public Health Division: (416) 327-7392
- Spills Action Centre: (416) 325-3000 or 1-800-268-6060
- Botulism Reference Service office: (613) 957-0902
  After-hours: (613) 296-1139
- Special Access Programme: (613) 941-2108

Symptoms

Foodborne

Initially, symptoms of foodborne botulism may include vomiting and/or diarrhea followed by one or

Intestinal (“infant botulism” and “adult colonization”)

Intestinal botulism affects infants under one year of age almost exclusively, but can affect adults who
What Should I Do If I Suspect a Botulism Case?

- **Step 1 – Obtain antitoxin**
  - For adult botulism obtain equine botulism antitoxin from the Ministry of Health and Long-Term Care
  - For infant botulism obtain infant botulism antitoxin (BabyBIG)
  - Contact numbers provided for Enteric and Zoonotic Diseases Unit, Infectious Diseases Branch
What Should I Do If I Suspect a Botulism Case?

- Step 2 – Notify the Botulism Reference Service for Canada
  - Discuss the clinical presentation of the suspect case
  - Obtain advice on the appropriate specimens prior to administration of antitoxin.
What Should I Do If I Suspect a Botulism Case?

- Step 3 – Obtain the appropriate specimens and forward the specimens to the Botulism Reference Service for Canada in Ottawa
  - Clinical specimens include fecal samples, gastric contents and serum
  - Obtain a case history, including foods consumed in past 24h
  - Foods may include leftovers
  - Commercial foods
    - Retrieve the label, manufacturer’s lot number and codes on the can or package.
Samples

- **Clinical samples**
  - Serum (toxin)
    - Obtain prior to administration of antitoxin
  - Stool (toxin and *Clostridium botulinum*)
  - Gastric liquid (toxin and *Clostridium botulinum*)

- **Food samples**
  - Any foods consumed by patient in the past 36 hours
  - Provide a list of other foods in the residence to the BRS
    - Will decide on foods to test based on ability to support growth of *Clostridium botulinum* and toxin production

- Send directly to the Botulism Reference Service
What Should I Do If I Suspect a Botulism Case?

- **Step 4 –** Call your local health unit immediately
  - Botulism is a reportable disease in Ontario under the Health Protection and Promotion Act.
  - Botulism should be reported even if it is only suspected and has not yet been confirmed.

- **Step 5 –** Provide patient information to MoHLTC
  - Patient initials, date of birth, sex, dosage of antitoxin, date administered.
  - Information is provided to the Health Canada Special Access Programme.
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