

# 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 – 1 $\mu$ g = 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)





HEALTH PRODUCTS AND FOOD BRANCH

OTTAWA

**DETECTION OF *CLOSTRIDIUM BOTULINUM* AND ITS TOXINS  
IN SUSPECT FOODS AND CLINICAL SPECIMENS**

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1    **APPLICATION**

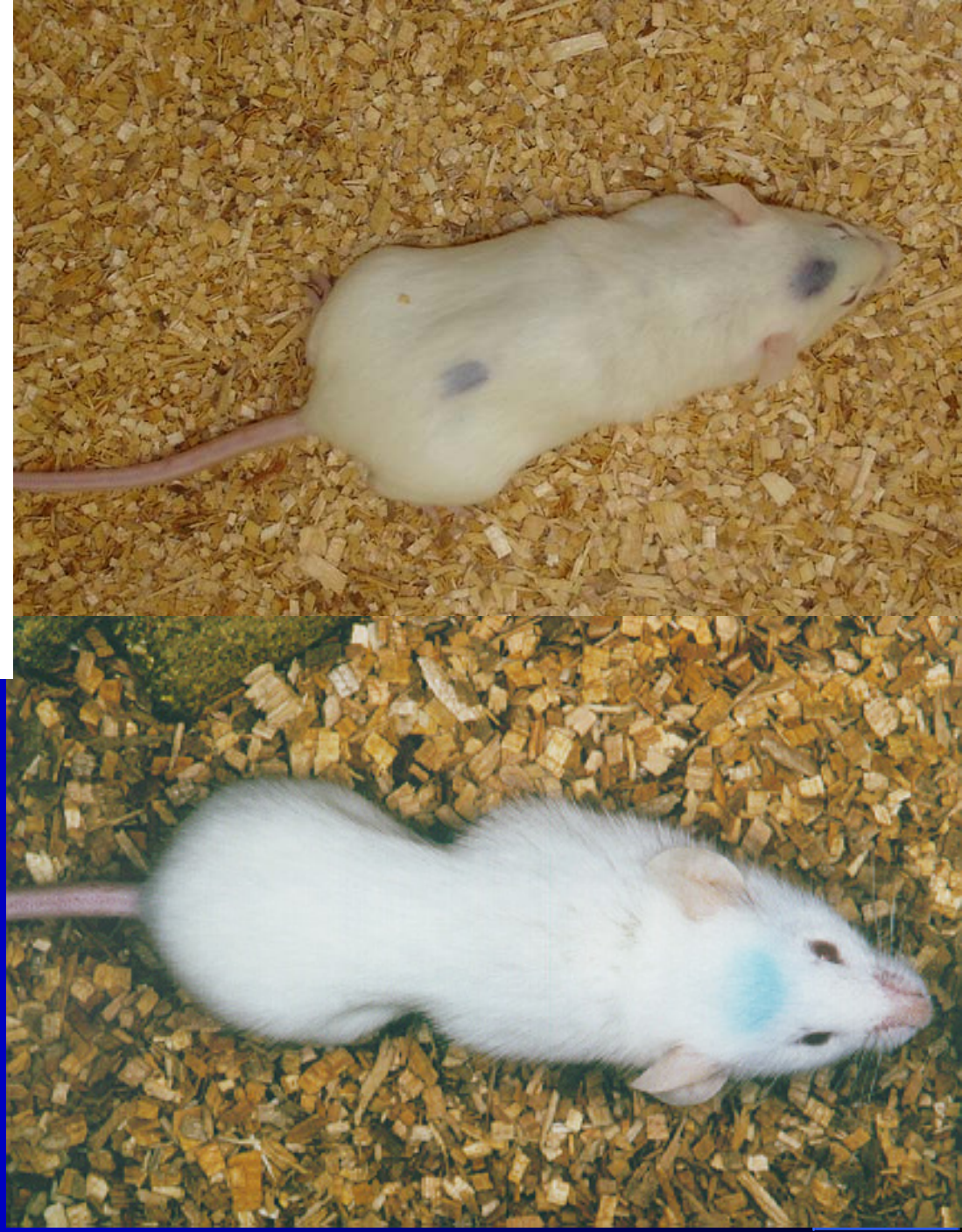
This method is applicable to the detection of botulinum toxin and viable *C. botulinum* in suspect foods and clinical specimens, in accordance with Section 4 of the Food and Drugs Act. All work is to be carried out in cooperation with the Botulism Reference Service in Ottawa. This revised method replaces MFHPB-16, dated April 1997.

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**:

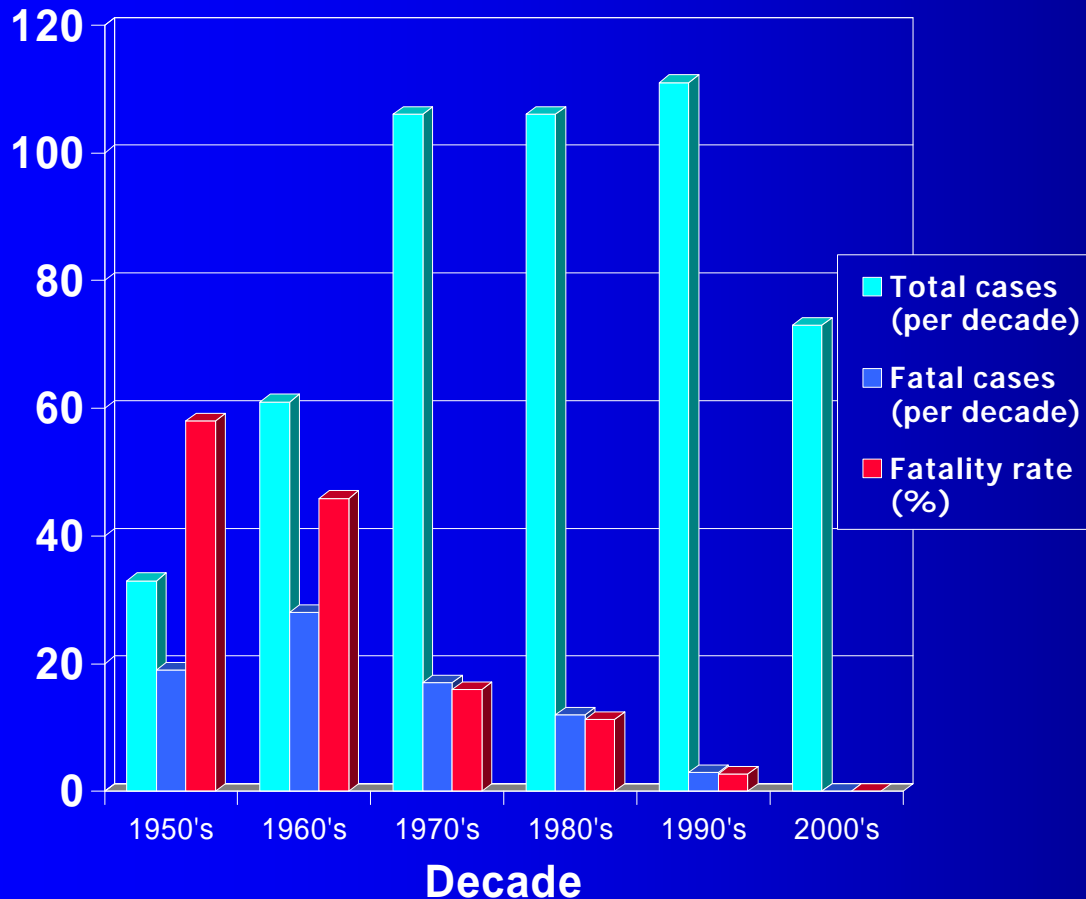
- detection of botulinum **toxin** in serum, stool, **gastric aspirate** or food

or

- isolation of *C. botulinum* from **stool** or **gastric aspirate**

- <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/09vol35/35s2/Botulis-eng.php>

# 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.

# 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](http://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

- <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/09vol35/35s2/Botulis-eng.php>

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# 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).

## **Symptoms**

### **Foodborne**

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

### **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

### **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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