
Botulism

This fact sheet is for informational purposes only. It is not intended to 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.

What is botulism?

Botulism is a rare but serious paralytic illness caused by a nerve toxin produced by the bacterium *Clostridium botulinum* (klos-trih-dee-um bot-u-li-num). Human botulism is mainly caused by four of the seven recognized types of *Clostridium botulinum* bacteria: types A, E, rarely F and possibly G.

The recorded history of botulism began in 1735, when the disease was first associated with the consumption of sausage. In 1870, John Muller, a German physician, derived the name botulism from the Latin word for sausage.

There are four kinds of botulism:

- food-borne botulism
- wound botulism
- infant botulism, and
- adult intestinal colonization botulism

All forms of botulism can be fatal and should be considered medical emergencies.

How common is botulism?

Because of better food canning processes, especially with home canning, the number of yearly cases has dropped to about 1,000 worldwide.³ In Ontario during 2003-2009, there were approximately 3 confirmed cases of botulism reported each year, on average.¹

What are the symptoms of botulism?

The symptoms of botulism may include:

- double vision
- blurred vision
- drooping eyelids
- slurred speech
- difficulty swallowing
- dry mouth
- muscle weakness, and
- flaccid, symmetric, descending paralysis

These are all symptoms of muscle paralysis caused by the bacterial toxin. If untreated, these symptoms may progress to paralysis of the neck, arms, respiratory muscles, torso and legs.

Infants with botulism appear lethargic, feed poorly, are constipated, have a weak cry and exhibit poor muscle tone.

In food-borne botulism, symptoms generally begin 12 to 36 hours after eating a contaminated food, but they can occur as early as six hours or as late as 10 days. Vomiting and constipation or diarrhea may be present initially.

How does botulism spread?

Clostridium botulinum bacterium forms spores, which are small, usually single-celled reproductive bodies that are highly resistant to drought and heat and capable of growing into new organisms.

Under conditions with little oxygen (anaerobic), botulinum spores can germinate, resulting in the growth of bacteria and the production of the toxin. Botulism is not transmitted from person to person. Botulism develops if a person ingests the toxin (or rarely, if the toxin is inhaled or injected) or if the organism grows in the intestines or wounds and toxin is released.

Food-borne botulism is spread by consuming food contaminated with the botulinum toxin or spores. It can be especially dangerous because many people can be poisoned by consuming contaminated food from the same source.

Foods commonly associated with botulism include:

- inadequately home-canned foods with low acid content, such as asparagus, green beans, beets and corn
- lightly preserved foods such as fermented, salted or smoked fish and meat products

Wound botulism occurs when the spores of *Clostridium botulinum* get into an open wound and are able to reproduce. It can result from contamination of wounds by soil, gravel, or improperly treated open fractures. It has also been associated with the use of injectable street drugs.

Infant botulism occurs when infants ingest *Clostridium botulinum* spores. In most adults and children older than one year, the body's natural defenses that develop over time prevent the germination and growth of these spores. However, because infants have not yet developed these natural defenses, the spores grow in the infant's gut, producing the bacteria that release the toxin. Honey and corn syrup are the food sources of infant botulism.

Adult intestinal colonization botulism is another form of botulism. It is similar to infant botulism but occurs in older children and adults with bowel abnormalities such as colitis, intestinal bypass procedures, or in association with other conditions that may create local or widespread disruption in the normal intestinal flora.

How is botulism diagnosed?

Botulism is diagnosed through a combined assessment of the patient's symptoms and history and specialized tests to rule out other diseases that

can appear as botulism, such as stroke, myasthenia gravis and Guillain-Barré syndrome. These tests may include a brain scan, spinal fluid examination and nerve conduction tests. The most direct way to confirm the diagnosis is to detect the botulinum toxin in the patient's serum or stool. The bacteria can also be isolated from the stool of persons with food-borne and infant botulism.

How can botulism be treated?

When diagnosed early, food-borne and wound botulism can be treated with a botulinum antitoxin. The antitoxin can prevent a patient's condition from becoming worse, and reduces the chances of complications. Physicians may try to remove contaminated food still in the patient's digestive system by inducing vomiting or by using enemas.

In severe botulism, respiratory failure and paralysis may require a patient to be on a ventilator for weeks.

Wounds are usually treated surgically, to remove the source of the toxin-producing bacteria.

How can you prevent botulism?

Practice safe [home canning](#) and food preservation techniques. Follow strict hygienic procedures to reduce contamination of foods. Do not eat from cans that are leaking or have bulging ends. Persons who eat home-canned food should consider boiling the content for 10 minutes before eating to ensure safety.

Do not feed honey or corn syrup to children less than 12 months of age.

Potatoes that have been baked while wrapped in aluminum foil should be refrigerated (4 degrees Celsius or lower) or kept hot (60 degrees Celsius or higher) until served.

Always refrigerate products made with garlic or herbs soaked in oil. The oil provides an environment where any botulinum spores present on the garlic or herbs can germinate and produce the toxin.

Note: freezer temperatures inhibit growth of *Clostridium botulinum* bacteria in frozen food.

Low moisture controls its growth in dried food.
High oxygen controls its growth in fresh foods.

Seek medical care for infected wounds or skin cuts
and avoid using injectable street drugs.

What causes botulism outbreaks?

Outbreaks of food-borne botulism have been associated with chopped garlic in oil, chili peppers, tomatoes, carrot juice and baked potatoes. In Canada, outbreaks have also been associated with seal meat, smoked salmon and fermented salmon eggs.

References

1. Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted April 2010.
2. Heymann. D.L. "Control of Communicable Diseases Manual". 19th Edition. 2008. American Public Health Association: Washington D.C.
3. **Medicine Net**
(<http://www.medicinenet.com/botulism/page3.htm>)
4. [Centers for Disease Control and Prevention website](#)
5. [Canadian Food Inspection Agency website](#)
6. [World Health Organization website](#)

Where do I go for more information?

Government of Ontario

Ministry of Health and Long-Term Care;
[Botulism – Guide for Healthcare Professionals](#)

For more information on safe home canning visit [Eat Right Ontario](#)'s website at:
<http://www.eatrightontario.ca/en/ViewDocument.aspx?id=317#>

For information about health services and resources visit Ministry of Health and Long-Term Care's website at: www.health.gov.on.ca

For consumer-friendly health tips and information visit HealthyOntario.com at:
<http://www.healthyontario.com>
INFOline: 1-877-234-4343;
TTY: 1-800-387-5559

Telehealth Ontario:
1-866-797-0000; TTY 1-866-797-0007

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