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## Botulism

### What is botulism?

Botulism is a rare but serious paralytic illness caused by a nerve toxin that is produced by the bacterium *Clostridium botulinum*. There are three main kinds of botulism. Foodborne botulism is caused by eating foods that contain the botulism toxin. Wound botulism is caused by toxin produced from a wound infected by *C. botulinum*. Infant botulism is caused by consuming the spores of the botulinum bacteria, which then grow in the intestines and release toxin. All forms of botulism can be fatal and are considered medical emergencies. Foodborne botulism can be especially dangerous because eating a contaminated food can poison numerous people.

### Where is *Clostridium botulinum* found?

*Clostridium botulinum* is the name of a group of bacteria commonly found in soil. These rod-shaped organisms grow best in low-oxygen conditions. The bacteria form spores, which allow them to survive in a dormant state until exposed to conditions that can support their growth. There are seven types of botulism toxin designated by the letters A through G; only A, B, E, and F cause illness in humans.

### How common is botulism?

In the United States an average of 110 cases of botulism are reported each year. Of these, approximately 25% are foodborne, 72% are infant botulism, and the rest are wound

botulism. Outbreaks of foodborne botulism involving two or more persons occur most years and are usually caused by eating contaminated home-canned food. The number of cases of foodborne and infant botulism has changed little in recent years, but wound botulism has increased because of the use of black-tar heroin, especially in California.

### Why is botulinum toxin a potential bioweapon?

Botulinum toxin is considered a bioweapons threat because it is extremely potent and lethal. It is also easy to produce, transport, and misuse. It can either be aerosolized into the air or used as a contaminant in food. Also a number of countries are known to have developed botulinum toxin as a biological weapon. Aum Shinrikyo, the group that was responsible for releasing sarin gas in the Tokyo subway system, tried *botulinum* toxin first but failed to perfect its use.

### What are the symptoms of botulism?

The classic symptoms of botulism include double vision, blurred vision, drooping eyelids, slurred speech, difficulty swallowing, dry mouth, and muscle weakness. Infants with botulism appear lethargic, feed poorly, are constipated, and have a weak cry and poor muscle tone. These are all symptoms of the muscle paralysis caused by the bacterial toxin. If untreated, these symptoms may progress to cause paralysis of the arms, legs, trunk, and respiratory muscles. In foodborne botulism, symptoms generally begin 18 to 36 hours

after eating a contaminated food, but they can occur as early as 6 hours or as late as 10 days.

### **How is botulism diagnosed?**

Physicians may consider the diagnosis if the patient's history and physical examination suggest botulism. However, these clues are usually not enough to allow a diagnosis of botulism. Other diseases can appear similar to botulism, such as stroke, but special tests can exclude these other conditions. The most direct way to confirm the diagnosis is to demonstrate the presence of botulinum toxin in the patient's system.

### **How can botulism be treated?**

The respiratory failure and paralysis that occur with severe botulism may require a patient to be on a breathing machine (ventilator) for weeks, plus intensive medical and nursing care. After several weeks the paralysis slowly improves. If diagnosed early, foodborne and wound botulism can be treated with an antitoxin which blocks the action of toxin circulating in the blood. This can prevent patients from worsening, but recovery still takes many weeks. Physicians may try to remove contaminated food still in the digestive tract if the toxin was foodborne. Wounds should be treated, usually surgically, to remove the source of the toxin-producing bacteria. Good supportive care in a hospital is the mainstay of therapy for all forms of botulism. Currently, antitoxin is not routinely given to treat infant botulism.

### **Are there complications from botulism?**

Botulism can result in death due to respiratory failure. However, in the past 50 years, the proportion of patients with botulism who die has fallen from about 50% to 8%. Patients who survive an episode of botulism poisoning may have fatigue and shortness of breath for years and long-term therapy may be needed to aid recovery.

### **How can botulism be prevented?**

Foodborne botulism has often been from home-canned foods with low acid content, such as asparagus, green beans, beets, and corn. However, outbreaks of botulism from more unusual sources such as improperly handled chopped garlic in oil, chili peppers, and tomatoes have occurred. Persons who do home canning should follow strict hygienic procedures to reduce contamination of foods. Oils infused with garlic or herbs should be refrigerated. Because high temperatures destroy the botulism toxin, persons who eat home-canned foods should consider boiling the food for 10 minutes before eating it to ensure safety. Instructions on safe home canning can be obtained from county extension services or from the US Department of Agriculture. Because honey can contain spores of *Clostridium botulinum* and this has been a source of infection in infants, children younger than 12 months should not be fed honey. Honey is safe for persons 1 year of age or older. Wound botulism can be prevented by promptly seeking medical care for infected wounds and by not using injectable street drugs. If you suspect that you may have been exposed to botulinum toxin in any manner, seek medical help immediately.

**For specific concerns about botulism, call the New Hampshire Department of Health and Human Services, Bureau of Infectious Disease Control at 603-271-4496 or 800-852-3345 x4496. For further information, refer to the Centers for Disease Control and Prevention website at [www.cdc.gov](http://www.cdc.gov) or the New Hampshire Department of Health and Human Services website at [www.dhhs.nh.gov](http://www.dhhs.nh.gov).**