

*epi*TRENDS

A Monthly Bulletin on Communicable Disease Epidemiology and
Public Health Practice in Washington State

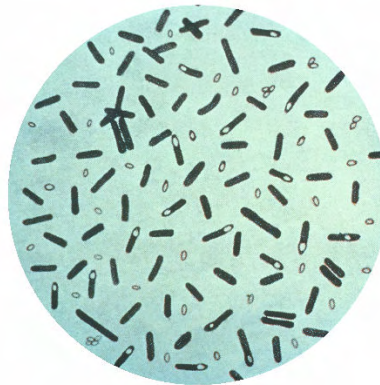
Foodborne Botulism

Vol. 14 No. 7

During the 19th century a paralytic disease associated with poorly cured sausage (*botulus*, "sausage") was named botulism. The causative bacterial organism, *Clostridium botulinum*, was identified by the end of the century. Since that time, although our understanding of botulism has expanded greatly, prevention measures remain challenging.

The Disease

The genus *Clostridium* includes spore-forming obligate anaerobic bacteria. Not all species within the genus are pathogens but several produce toxins that cause severe illnesses such as botulism, tetanus, and gas gangrene. *C. botulinum* and rarely other clostridial species produce botulinum toxin that is responsible for botulism. Several toxin types cause human illness (A, B, E, and F). Animals, particularly birds, also can be affected by botulinum toxin.



Clostridium botulinum

Image courtesy of CDC

Symptoms of botulism result from irreversible binding of botulinum neurotoxin to areas of the central nervous system. Cranial nerves are affected first with facial paralysis, drooping eyelids, double or blurred vision, dry mouth, change in voice, and difficulty swallowing. With a sufficient dose of toxin, symptoms may progress rapidly and descending paralysis may result in respiratory failure. Sensation and cognition are not affected. In infants symptoms may be subtle, with poor feeding resulting in weight loss ("failure to thrive") leading to medical attention.

In the 1970s botulinum antitoxin was prepared from horses; each horse was immunized against one toxin type. Antibody to the toxin ("antitoxin") neutralizes only unbound toxin and does not remove bound toxin. Antitoxin is available after consultation with Washington State Department of Health and Centers for Disease Control and Prevention. In Washington, antitoxin is only stored at the CDC Quarantine Station at SeaTac airport and must be transported from this site to the patient.

Continued page 2

60.70



*epi*Trends
P.O. Box 47812
Olympia, WA 98504-7812

Mary C. Selecky
Secretary
Maxine Hayes, MD, MPH
State Health Officer
Anthony Marfin, MD, MPH, MA
State Epidemiologist
Communicable Disease
Marcia J. Goldoft, MD, MPH
Scientific Editor
Deborah Todd, RN, MPH
Managing Editor

Since prompt administration of antitoxin may prevent progression of symptoms to respiratory failure, treating suspected botulism is a medical emergency and should not wait for laboratory testing, which may take several days. Supportive care including mechanical ventilation may also be necessary. Infant botulism is treated with human botulism immune globulin.



Botulism requires prompt medical treatment to prevent respiratory failure

Image courtesy of CDC

Only public health laboratories test for botulinum toxin in food or clinical specimens. Washington State Public Health Laboratories offer toxin assays as well as bacterial culture and toxin typing. Although many diagnostic laboratories can culture *C. botulinum*, most choose not to offer the test because the toxin is a potential agent of bioterrorism.

There are three routes of exposure for botulism. **Infant botulism**, the most common kind of botulism in this country, results from intestinal growth of the bacteria, presumably from spores ingested with dirt, dust, or food. Rare **intestinal botulism** occurs in older children or adults and is also due to bacterial growth in the intestine especially when there are anatomic abnormalities. In **wound botulism**, the bacteria grow in contaminated, damaged tissue such as a dirty traumatic injury or the injection site for illicit drug use. Ingesting toxin produced in improperly processed foods can result in **foodborne botulism**.

*epi*TRENDS Monthly Posting Alert

To receive monthly e-mail notification of *epi*TRENDS, please register at this website:

[http://
listserv.wa.gov/
archives/
epitrends.html](http://listserv.wa.gov/archives/epitrends.html)

Choose the option to join the listserve. Enter your name and email address.

Foodborne Botulism in Washington

Clostridia reproduce in a low oxygen non-acid (e.g., neutral or high pH) environment with a sufficient amount of water present (water activity). Salting, pickling or acidifying, using syrup, or correctly canning foods will prevent growth of the organism. If neutral or low acid foods are canned without proper pressure and temperature methods, botulinum spores can germinate and the bacteria grow in the food. Unlike the heat resistant botulinum spores, the toxin is rapidly deactivated by boiling.

Almost all foodborne botulism cases recently identified in the United States are due to non-commercial products, although improperly canned commercial chili caused an outbreak of eight cases in 2008 and restaurants mishandling food have caused small outbreaks. Usual foods causing botulism are low acid vegetables processed at home. Foods associated with botulism cases in Washington have included asparagus, beets, carrots, green beans, salmon, salsa, spinach, and tomatoes.



Testing for botulism in food

Image courtesy of CDC

Cases of foodborne botulism were reported more commonly in Washington in the past when up to 16 cases (in 1939) and up to 6 deaths (in 1921) occurred. In recent years, there is about one case annually. Of the ten food botulism cases reported for 2000 through June 2009, the median age was 40 years (range 1 to 86 years). There were no deaths. One cluster of three cases associated with home canned green beans was reported. In western states, toxin type A typically causes the illness but other types can occur. Fish and other marine products are associated with type E.

There are two formulations of antitoxin. One contains antitoxin for toxins A and B while another contains antitoxin for toxins A, B, and E. To ensure correct treatment, is important to identify potential sources of botulism exposure through fish and other seafood.

Preventing Botulism

When a suspected case of botulism is reported, the local health jurisdiction should arrange direct communication between the health care provider and the Communicable Disease Epidemiology Section. In addition, the jurisdiction should interview the case or a close contact to determine likely exposures. For suspected botulism in a child over a year of age or an adult, assume a foodborne exposure if there is no history of a contaminated wound or drug use. Determine if others could have shared a home canned product, if there is additional home canned food that could put others at risk, or if a commercial food source was a possible source of exposure.



Home canned foods are a typical source of foodborne botulism

Image courtesy of CDC

Several factors could contribute to increasing cases of foodborne botulism in the near future. It is likely that familiarity with home canning has declined. In addition, old recipes that were once safe may no longer be so. For example, many popular strains of tomatoes are no longer sufficiently acidic to can safely by hot water bath methods without acidifying the food, such as with citric acid or lemon juice. Finally, during periods of economic decline there may also be increased incentives to can food at home. If larger numbers of inexperienced people home process food this summer there could be increases in foodborne botulism. Local health jurisdictions are encouraged to:

- Promote safe methods for food processing at home
- Educate health care providers for early reporting of suspected botulism

Resources

Home canning guide

<http://foodsafety.wsu.edu/consumers/factsheet4.htm> or
<http://foodsafety.psu.edu/canningguide.html>

CDC botulism handbook

http://www.cdc.gov/nczved/dfbmd/disease_listing/files/botulism.pdf