



BOTULISM

(See also **INFANT BOTULISM** and **WOUND BOTULISM**, below.)

1. **Agent:** Toxin produced by *Clostridium botulinum* (and rarely other clostridium species), a gram-positive bacillus. Most cases due to type A, B or E toxin. Heat-labile toxin is produced under anaerobic conditions extrinsically (food-borne botulism) or intrinsically in the gastrointestinal tract (intestinal botulism, infant botulism) or wound (wound botulism).
2. **Identification:**
 - a. **Symptoms:** An intoxication characterized by weakness, extreme dryness of the mouth, headache and constipation (although vomiting and diarrhea may occur), followed by symmetrical cranial nerve motor paralysis, ptosis, visual difficulty, and descending paralysis. Severity appears dose related.

Death may occur from respiratory failure or superimposed infections.
 - b. **Differential Diagnosis:** Guillain-Barré syndrome (Miller-Fisher variant), myasthenia gravis, cerebrovascular accident, tick paralysis, neoplasia, or chemical intoxication.
 - c. **Diagnosis:** Demonstration of toxin in feces or serum of the patient or in a suspected food item. Isolation of the organism from feces, wound, or suspected food is indicative of source.
3. **Incubation period:** Usually within 12-36 hours of eating contaminated food, but may occur several days afterward. Wound botulism occurs within days of injury.
4. **Reservoir:** *C. botulinum* spores in soil, water, and the intestinal tracts of animals, including fish.
5. **Source:** Toxins are produced by *C. botulinum* and rarely other clostridium species under anaerobic conditions, usually by improperly home-canned foods, especially low acid food, corn, beans; baked potato or

mishandled foods that should have been refrigerated. Also in contaminated, closed wounds, similar to tetanus (*C. tetani*).

6. **Transmission:** Ingestion of toxin or production of toxin in infected wound or GI tract.
7. **Communicability:** Not communicable person to person.
8. **Specific Treatment:** Heptavalent (A-B-C-D-E-F-G) equine-based botulinum antitoxin (H-BAT) available under CDC investigational new drug (IND) protocol #6750 and CDC institutional review board #4509 application, beginning 12 March 2010. ACDC or CA Dept of Public Health (CDPH) must authorize release of antitoxin.
9. **Immunity:** None.

REPORTING PROCEDURES

1. Report any case or suspect case by telephone immediately, Title 17, Section 2500, *California Code of Regulations*.
 - a. Call Morbidity Unit during working hours.
 - b. Call Chief, ACDC, and Chief, Food and Milk Section if foodborne suspected. After working hours, contact Administrative Officer of the Day (AOD) through County Operator.
 - c. Suspected foodborne botulism case to be reported to CDC Emergency Operations Center – 770-488-7100 – within 4 hours of receipt of initial report. Notification of CDPH is considered a notification of CDC.
2. **Report Form:**

SUSPECT BOTULISM INTAKE AND CHECKLIST (acd-suspbotulism)

BOTULISM CASE REPORT (CDPH 8547)

Upon consultation with the reporting clinician, the AOD is to complete both intake/checklist and the case report (as much of pages 1-3 as possible). AOD is to report to Chief or Deputy Chief of ACDC to determine actions to follow. Case report to be faxed to CDPH



on next business day to 510-620-3425. If the case is confirmed or probable, complete the entire case report pages 1-3 for submission to CDPH, who will contact treating physician to complete pages 4-5 (Antitoxin Treatment; Antitoxin Reactions) after administration of antitoxin.

3. Epidemiologic Data:

- a. Date and hour of onset of symptoms. Duration of symptoms. Record symptoms in order of their development.
- b. Food history for past 96 hours and method of food preparation. For instance, did they taste any home-canned foods after opening, but before cooking the food?
- c. Ingestion of improperly home-canned or preserved foods poses a high risk. Commercially canned foods are rarely involved unless mishandled.
- d. Location of remaining suspect food.
- e. Names, addresses, and ages of others that ate suspected food and time this occurred.
- f. For wound botulism - onset of wound infection, how original wound occurred.

CONTROL OF CASE, CONTACTS & CARRIERS

Immediate investigation is required, regardless of time of day. Confiscate suspected food(s) for possible laboratory testing and notify others who may have suspected food in their possession.

CASE:

Precautions: None

1. Immediate hospitalization at hospital with intensive care unit is essential.
2. Use of antitoxin must not await laboratory diagnosis if clinical findings are highly suggestive of botulism. Follow IND protocol carefully for dosage and allergic precautions.

3. A case of suspected foodborne botulism should receive cathartics to hasten elimination of lower intestinal contents.
4. A case of suspected wound botulism must be examined carefully to locate the site of infection for surgical debridement; appropriate antibiotics should be administered.

CONTACTS: Household members or persons who shared a common food source.

1. Search for missed cases and those at risk of illness, and refer them for medical evaluation if symptomatic.
2. For persons known to have eaten suspected food within 96 hours, purge with cathartics, give enemas, and maintain close observation. If symptomatic, treat as case.

CARRIERS: Not applicable

PREVENTION-EDUCATION

1. Follow recommended procedures in canning and preparing foods at home.
2. Boil home-canned vegetables and meat products for at least 10 minutes with thorough stirring, prior to tasting or eating.
3. Avoid contamination of wounds with soil or nonsterile substances.

DIAGNOSTIC PROCEDURES

Prior notification of ACDC required. See [Specimen Submission Guidelines for Suspected Botulism](#) for complete instructions on specimen collection and submission. In brief:

1. **Stool Samples:** Submit 10-50 g of unpreserved feces specimen. Sterile water enemas may be necessary to obtain specimens. Fecal specimens should be refrigerated.

Container: Sterile container with lid.

Laboratory Form: Test Requisition Form H-3021 (Rev. 9/07)

Examination Requested: Botulism.



2. **Blood Sample:** Treating facility obtains a 10-20 ml blood specimen from patient prior to the administration of antitoxin and submits it to PHL with other clinical specimens. Post-treatment serologic testing of botulism cases and suspects is not indicated.
3. **Food Samples:** Must be collected by a Food and Milk environmental specialist under ACDC direction.

Container: Original container or a clean, covered container.

Laboratory Form: Test Requisition Form H-3021 (Rev. 9/07)

Examination Requested: Botulism.

Material: Suspected food.

Storage: Refrigerate.

4. **Wound Culture:** Treating facility obtains anaerobic cultures of wounds or abscesses for processing by the hospital laboratory. If possible, collect with a laboratorian in attendance for immediate anaerobic processing. Sample any evident wounds, including fracture sites; submit aspirate, excisional biopsy, or swab. Place in anaerobic transport pouch, keeping chilled at all times. If a clostridial species is isolated, consult Public Health Laboratory for instructions on submission.



INFANT (INTESTINAL) BOTULISM

Botulism in infants less than 12 months of age was first described in 1976. Infant botulism, correctly known as intestinal botulism, affects children under 1 year of age almost exclusively but can affect adults who have altered GI anatomy and microflora. Following ingestion of spores, production of toxin occurs within the gut lumen. The illness usually begins with constipation followed by lethargy, listlessness, poor feeding, ptosis, poor head control, and difficulty in swallowing; it has been termed "floppy baby" syndrome. Identified food sources, such as honey and corn syrup, should never be fed to infants.

The local health department's only responsibility is immediate telephone reporting of suspected cases to the CDPH. All suspected cases are investigated by the Infant Botulism Treatment and Prevention Program, in the California Department of Public Health's Division of Communicable Disease Control. Call (510) 231-7600 (24 hours a day, 7 days a week, including holidays). Excellent background information and family materials in English and Spanish are available on the program website at <http://www.infantbotulism.org/>.

In vivo botulinum toxin production in the non-infant gastrointestinal tract has been rarely reported. This has also been termed adult intestinal or enteric botulism. Persons with intestinal abnormalities such as previous surgery, inflammatory bowel disease or diverticulosis may have a blind intestinal pouch that does not empty normally, allowing GI contents to remain for longer than normal. If spores of *C. botulinum* are present, they may germinate and produce botulinum toxin.

WOUND BOTULISM

Wound botulism results when spores of *C. botulinum* germinate in a wound, producing botulinum toxin. Previously this was extremely rare and usually associated with traumatic injuries such as punctures or open fractures. Wound botulism attributable to injecting drug use was first reported in 1982 in New York City.

Since 1995, California has seen an explosion of wound botulism among injectors of illicit substances, principally a form of heroin called "black tar." Unlike botulinum toxin, which is destroyed by heating, spores of *C. botulinum*, which may be in the heroin or one of the solvents employed by injecting drug users, are NOT destroyed by briefly boiling the heroin-solvent mixture. In most cases, injection is subcutaneous rather than intravenous, allowing for abscess formation and toxin production in the wound. Wound botulism has also been described in persons with intranasal abscesses who sniff cocaine chronically.

A thorough physical examination for an occult wound is indicated when the food history does not suggest a typical source for botulism. Debridement and drainage of infected wounds plus antibiotic treatment are crucial to stopping further toxin production. Treatment with heptavalent botulinum antitoxin is also indicated.