BOTULISM

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

1. **Agent**: Toxin produced by *Clostridium botulinum*, 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 (GI tract or wound due to any cause). Botulism toxin is considered a potential agent for bioterrorists.

2. **Identification:**

   a. **Symptoms**: Severe 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-Barre syndrome (Miller-Fisher variant), myasthenia gravis, cerebrovascular accident, tick paralysis, or chemical intoxication.

   c. **Diagnosis**: Demonstration of toxin in feces or serum of the patient or in a suspected food item. Isolation of toxin-producing organism from feces, wound, or suspected food is indicative of source.

3. **Incubation**: 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 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 (anaerobic) 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**: Bivalent or trivalent (A-B or A-B-E) antitoxin preparations available. ACDC or the State Health Department 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, for all suspects, and Chief, Food and Milk Section if foodborne botulism is suspected. After working hours, contact Administrative Officer of the Day through County Operator.

   c. Any laboratory that receives a specimen for botulism testing is required to report to the State Microbial Diseases Laboratory immediately (Title 17, Section 2505, *California Code of Regulations).*

   d. ACDC must notify the State Division of Communicable Disease Control immediately upon receiving notice of a case of suspected botulism.

2. **Report Form: BOTULISM CASE REPORT (DHS 8547, 12/99 fillable).**

   If a prepared commercial food item is the LIKELY source of this infection, a **FOODBORNE INCIDENT REPORT** should be filed. For likelihood determination and filing procedures, see Part 1, Section 7 - Reporting of a Case or Cluster of Cases Associated with a Commercial Food: Filing of Foodborne Incident Reports.

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) and notify others who may have suspected food in their possession.

CASE:

Precautions: None.

1. Immediate hospitalization is essential at hospital with intensive care unit.

2. Use of antitoxin must not await laboratory diagnosis if clinical findings are highly suggestive of botulism. Follow package insert carefully for dosage and allergic precautions.

CONTACTS:

1. Search for missed cases and those at risk of illness, and refer them for medical evaluation.

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.

CARRIER: Not applicable.

PREVENTION-EDUCATION

1. Follow recommended procedures in canning and preparing foods at home.

2. Boil home-canned vegetables and meat products for 10 or more 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 and Public Health Laboratory required:

1. **Stool Samples**: Submit 25-50 g of unpreserved feces specimen. Sterile, non-bacteriostatic water enemas may be necessary to obtain specimens. Fecal specimens should be refrigerated. May be collected pre- or post-toxin administration. List medications patient received recently.

   Container: Sterile container with lid.

   Laboratory Form: **Test Requisition and Report Form H-3021 or online request if electronically linked to the Public Health Laboratory.**

   Examination Requested: Botulism.

2. **Blood Samples, Pretreatment**: Treating facility obtains three 10 ml red-top, serum-separating tubes of blood from patient prior to the administration of antitoxin and notifies ACDC or laboratory that specimen is available. Spin down cells and ship all tubes without removing serum. **Posttreatment serum** is obtained only for wound botulism cases; two 10 ml tubes are sufficient. List medications patient has received recently.

3. **Food Samples**: Must be collected by a Food and Milk environmental specialist, under ACDC direction. **Gastric contents** may be submitted for both suspected foodborne and wound botulism; package as for stool specimen.

   Container: Original container or a clean, covered container.

   Laboratory Form: **Test Requisition and Report Form H-3021 or online request if electronically linked to the Public Health Laboratory.**

   Examination Requested: Botulism.

   Material: Suspected food.

   Storage: Refrigerate.

4. **Wound Culture**: Obtain cultures of wounds or abscesses for processing by the treating facility. If possible, collect with a laboratorian in attendance for immediate processing. Sample any evident wounds, including fracture sites; submit aspirate, excisional biopsy, or swab. Place in anaerobic transport pouch, keeping chilled at all times. Consult Public Health Laboratory for further specifics.

INFANT BOTULISM

Botulism in infants less than 12 months of age was first described in 1976. It appears to be due to combination intoxication and infection ("toxico-infection"). It 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; "floppy baby" syndrome. Identified food sources, such as honey and corn syrup, should not be fed to infants.

More details can be found in the *Control of Communicable Diseases Manual*. At this time, all cases are individually investigated by the Surveillance, Research, and Evaluation Section of the Immunization Branch of the California State Department of Health Services Division of Communicable Disease Control, at **(510) 540-2646**, 24 hours a day. The local health department's responsibility is limited to immediate telephone reporting of suspected cases to the State.

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 vivo. 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 is crucial to stopping further toxin production. Treatment with botulinal antitoxin plus antibiotic treatment are also indicated.

In vivo botulinum toxin production in the adult gastrointestinal tract has been rarely reported. This has been termed adult 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.