

## **Botulism - Foodborne**

- Organism:** *Clostridium botulinum*, a spore forming obligate anaerobic bacillus that produces a neurotoxin.
- Incubation period:** 12-36 hours is the usual range. The shortest time is 6 hours and the longest is 10 days. Generally, the shorter the incubation period, the more severe will be the disease.
- Infectious period:** No person-to-person transmission has ever been documented.
- Transmission route:** Oral ingestion. Foodborne. In Alaska, all documented cases have been associated with Alaska Native fermented foods.

For a discussion of infant and wound botulism (rare events), see Control of Communicable Diseases Manual and California Infant Botulism Treatment and Prevention Program (<http://www.infantbotulism.org/>).

- Treatment:** Close observation and monitoring of respiratory Forced Vital Capacity (FVC) should be done. Supportive medical and nursing care with the capability to intubate and place on a ventilator needs to be present. In March 2013, FDA licensed the use of BAT™ for use in managing cases of suspected botulism. BAT™ contains antitoxins to treat botulism types A-G, including E, which is the most common type in Alaska. One vial of BAT™ is supplied in the SOE botulinum antitoxin kit stored in pharmacies at major hub hospitals and in the SOE Drug Room in Anchorage. Antitoxin cannot reverse the neurotoxin but can prevent further toxin from attaching to the neurons. Antimicrobial agents, especially aminoglycosides, should be avoided as they could increase the amount of toxin available for absorption. See BAT™ kit for details on administration: <http://www.epi.alaska.gov/id/botulism/BATPacket.pdf>.

**Note:** CDC Botulism Duty Officer may be consulted through the CDC/EOC 770-488-7100.

### **Information Needed for the Investigation**

#### **Verify the Diagnosis**

- Section of Epidemiology (SOE) staff should start filling out a case assignment form (last page of this chapter).
- Is there a history of eating Native fermented foods or home-canned vegetables?
- Are three of the following five symptoms present—nausea or vomiting, dysphagia, diplopia, dilated fixed pupils, or dry mouth or throat?
- Is there evidence of cranial nerve involvement such as fixed dilated pupils, facial paralysis, ptosis, hoarseness or difficulty swallowing?
- A 1-pager checklist is available for health care providers working up a patient with suspected botulism: <http://www.epi.alaska.gov/id/botulism/BotulismChecklistHCP.pdf>
- A 1-pager checklist is also available for SOE staff: <http://www.epi.alaska.gov/id/botulism/BotulismChecklistSOE.pdf>

### **Determine the Extent of Illness:**

- Determine if household or other contacts are ill or are at risk for disease (consumption of suspected contaminated food). Contact a local health care provider, public health nurse (PHN), patient or family member.
- A 1-pager investigation checklist is available for PHNs at: <http://www.epi.alaska.gov/id/botulism/BotulismChecklistPHN.pdf> .
- A 10-day monitoring log for asymptomatic people who shared the same food is available at: <http://www.epi.alaska.gov/id/botulism/BotulismMonitoringLog.pdf>
- Try to obtain a recent food history from the patient or from someone who knows what he/she may have eaten.
- Identify suspected food sources. While “fermented” foods have traditionally been thought of as the major culprit, it is important to consider all possible food sources. In addition to Alaska Native fermented foods, recent botulism cases in other states have been traced to baked potatoes wrapped in foil, frozen potpies, grilled onions and garlic stored in oil.
- Retrieve and refrigerate suspect foods and their containers. If the food is a commercial product, obtain the brand name, lot number and distributor and notify DEC.

### **Laboratory Specimens:**

- From the patient, collect approximately 20 mls of whole blood to obtain ~10 mls of serum BEFORE administration of the anti-toxin.
- Collect 25-50 gm of stool.
- Collect any emesis or gastric aspirate.
- Collect suspected food samples and bag separately. DEC or OEH can sometimes help with food collection.
- Specimens should be refrigerated, not frozen.
- All specimens and a specimen form for each should be sent to the Alaska State Public Health Laboratory in Anchorage.
- Specimen forms available at: <http://dhss.alaska.gov/dph/Labs/Documents/publications/AncSupplyReq.pdf>

### **Additional Notes:**

- 1. The afterhours contact # for the Lab is 1-855-222-9918. Contact the Lab on-call person 24/7 to alert them that you are working on a suspected botulism investigation. This ensures that they are aware and can begin making plans for testing before the next work day. Emails to the Special Pathogens group should include: June Pounder, Jennifer Eastman, Janet Fahrni, and Bernie Jilly.**
- 2. Consider collecting 25-50 gm stool from others who ate the suspect food if they are still within an incubation period of exposure. If they become ill after the interview or investigation, specimens will have already been collected.**

### **Contact and Control Measures**

- The goal is to identify other persons at risk and evaluate them for symptoms of botulism. This can be done through the Community Health Aide or the Public Health Nurse. If neither of these individuals is available, an EPI team member should travel to the area.

## **Botulism - Foodborne**

- Determine the source of infection to prevent other cases. This is done through interviews and epidemiology principles applied as in any foodborne outbreak.
- Determine the need for administration of botulism anti-toxin and if necessary send more out to the regional health care facility.
- Educate consumers about safe food preparation methods, see Botulism Monograph: [http://www.epi.alaska.gov/id/botulism/Botulism\\_08.pdf](http://www.epi.alaska.gov/id/botulism/Botulism_08.pdf)

### **Hospital Considerations**

- Use Standard Precautions. Not transmitted person-to-person.
- Siegel JD, Rhinehart E, Jackson M, Chiarello L, and the Healthcare Infection Control Practices Advisory Committee. 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings. Available at <http://www.cdc.gov/hicpac/pdf/isolation/isolation2007.pdf>

### **Reporting Requirements**

- Use the Botulism Case Report and the Clinical Outcome Forms provided in the BAT™ kit. Once completed, fax copies of the forms to CDC.
- SOE nurses, for every release of BAT™, send a fax to CDC's Botulism Program: 404-639-2205. Form available in this chapter.
- FTR: Write up all confirmed and probable cases in Botulism template on the T:drive.
- Write a case summary and file for all suspected negative cases.
- AK-STARS: Enter all confirmed and probable cases.
- NORS and foodborne outbreaks linelist: Enter all cases on the linelist; outbreaks (or >1 case) will be subsequently entered in NORS.
- CDC Case Definition is used to define confirmed and probable cases of botulism.

# Botulism Specimen Collection

## Foodborne Botulism

**Before administration of antitoxin to the patient, collect blood!**

- 20 mls of whole blood (no anticoagulant) or 10 mls serum, note collection time!**
- 10-50 grams of stool** (prefer before antitoxin, can be collected at any time)



**Think 20-10 before antitoxin!**

- 20 mls of emesis** or gastric aspirates
- Collect **suspected food** samples if available, send to lab.

**Specimens should be refrigerated, not frozen.**

Obtain the remainder of suspect food in the original container.

### Infant Botulism

- 2 ml of serum—NOT whole blood
- as much feces as possible up to 25-50 gm

### Wound Botulism

- 15-20 ml of serum
- 25-50 gm of feces
- Tissue, exudates or swab samples from the wound

### Specimen Shipping Information

Send specimens: Alaska State Public Health Laboratory (ASPHL), 5251 Dr MLK Jr Ave., Anchorage. Call ASPHL at 907-344-2100 for more information. Seal all oil or liquid food samples with duct tape. Address to **Special Pathogens**, ASPHL and include *Anchorage Lab Request Form*.

For more info: <http://dhss.alaska.gov/dph/Labs/Documents/LaboratoryTests.pdf>

### Laboratory Notification

The afterhours contact # for the Lab is 1-855-222-9918. Contact the Lab on-call person 24/7 to alert them that you are working on a suspected botulism investigation. This ensures that they are aware and can begin making plans for testing before the next work day. Emails to the Special Pathogens group should include: June Pounder, Jennifer Eastman, Janet Fahrni, and Bernie Jilly.



## Foodborne Botulism Fact Sheet

### **What is foodborne botulism?**

Botulism is caused by bacteria that makes a toxin (a poison) that can get into the food. If a person eats the food with the toxin they can become very sick because the toxin paralyzes the body's muscles. In fact, a person can die from botulism because the toxin can cause a person to stop breathing.

### **How do I get foodborne botulism?**

In Alaska, all reported foodborne botulism cases have been in Alaska Native people who had recently eaten traditionally prepared Native foods such as stink heads, stink eggs, whale, beaver or seal oil.

### **What are the symptoms of botulism?**

The classic symptoms of botulism can include vomiting, diarrhea, double vision, blurred vision, drooping eyelids, slurred speech, difficulty swallowing, dry mouth, trouble walking. Sometimes the person might look like they are drunk. If untreated, a person who is sick with botulism can stop breathing and die.

### **How soon do symptoms appear?**

Symptoms of botulism usually appear 12–36 hours after eating food that contains toxin, but can occur as early as 6 hours or as late as 10 days.

### **What is the treatment for botulism?**

Treatment for botulism requires medical and nursing care. **If you or someone you know has symptoms of botulism, go to the clinic right away** or call your clinic for help. Botulism can be prevented from getting worse with an antitoxin that blocks the action of toxin circulating in the blood. People often still need to stay in the hospital to manage their other symptoms. Sometimes, if they are having trouble breathing, they may require a breathing machine (ventilator) for weeks. People who are not treated or monitored for botulism may die.

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

Only cooking or boiling food destroys botulinum toxin. Freezing does not destroy the toxin. If you prepare or eat traditionally prepared Alaska Native foods, the food safety tips below may decrease your risk of botulism.

### **Food Safety Tips**

1. Wash your hands, your containers and your food before preparing your food.
2. Use methods that discourage the growth of *C. botulinum* bacteria when preparing aged traditional Native foods.
  - a. Use salt to preserve dried fish and discourage the growth of *C. botulinum* bacteria.
  - b. Do not use plastic, glass or sealed plastic bags to age foods as these create a low-oxygen environment encouraging the growth of the bacteria.
  - c. Age foods at a cold temperature, ideally below 37 degrees Fahrenheit.
3. Consider boiling or cooking food because heat destroys botulinum toxin. Depending on the food, this may be an option to reduce the presence of toxin in aged traditional foods.
4. When in doubt, throw it out.

**Please remember.....if you or someone you know has symptoms of botulism, go to the clinic right away or call your clinic for help.**

## **Botulism (*Clostridium botulinum*)**

### **2011 Case Definition**

#### **Botulism, Foodborne**

##### **Clinical description**

Ingestion of botulinum toxin results in an illness of variable severity. Common symptoms are diplopia, blurred vision, and bulbar weakness. Symmetric paralysis may progress rapidly.

##### **Laboratory criteria for diagnosis**

- Detection of botulinum toxin in serum, stool, or patient's food, or
- Isolation of *Clostridium botulinum* from stool

##### **Case classification**

*Probable*: a clinically compatible case with an epidemiologic link (e.g., ingestion of a home-canned food within the previous 48 hours)

*Confirmed*: a clinically compatible case that is laboratory confirmed or that occurs among persons who ate the same food as persons who have laboratory-confirmed botulism

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#### **Botulism, Infant**

##### **Clinical description**

An illness of infants, characterized by constipation, poor feeding, and “failure to thrive” that may be followed by progressive weakness, impaired respiration, and death

##### **Laboratory criteria for diagnosis**

- Detection of botulinum toxin in stool or serum, or
- Isolation of *Clostridium botulinum* from stool

##### **Case classification**

*Confirmed*: a clinically compatible case that is laboratory-confirmed, occurring in a child aged less than 1 year

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## **Botulism, Wound**

### **Clinical description**

An illness resulting from toxin produced by *Clostridium botulinum* that has infected a wound. Common symptoms are diplopia, blurred vision, and bulbar weakness. Symmetric paralysis may progress rapidly.

### **Laboratory criteria for diagnosis**

- Detection of botulinum toxin in serum, or
- Isolation of *Clostridium botulinum* from wound

### **Case classification**

*Confirmed*: a clinically compatible case that is laboratory confirmed in a patient who has no suspected exposure to contaminated food and who has a history of a fresh, contaminated wound during the 2 weeks before onset of symptoms, or a history of injection drug use within the 2 weeks before onset of symptoms

*Probable*: a clinically compatible case in a patient who has no suspected exposure to contaminated food and who has either a history of a fresh, contaminated wound during the 2 weeks before onset of symptoms, or a history of injection drug use within the 2 weeks before onset of symptoms

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## **Botulism, Other**

### **Clinical description**

See Botulism, Foodborne.

### **Laboratory criteria for diagnosis**

- Detection of botulinum toxin in clinical specimen, or
- Isolation of *Clostridium botulinum* from clinical specimen

### **Case classification**

*Confirmed*: a clinically compatible case that is laboratory-confirmed in a patient aged greater than or equal to 1 year who has no history of ingestion of suspect food and has no wounds

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## **Botulism, Intestinal (Infant)**

**Organism:** *Clostridium botulinum* and other clostridial species; *C. baratti*, *C. butyricum*. Usually toxin type A or B in U.S.

**Incubation Period:** Unknown since precise time of ingestion can often not be determined.

**Infectious Period:** None. No secondary cases ever documented despite excretion from infant.

### **Treatment:**

- Primarily supportive; mechanical ventilation can be lifesaving. Antimicrobials, particularly aminoglycosides, have been reported to increase the incidence of respiratory paralysis. However, complications, such as respiratory infections, may require antimicrobial therapy. Antitoxin, such as is used in cases of foodborne botulism, has **not** been shown to affect the outcome of infant botulism.
- Treatment with human-derived Botulism Immune Globulin Intravenous (BabyBIG®) might reduce the length of time needed for recovery. BabyBIG® can be obtained from the California Department of Health Services, Infant Botulism Treatment and Prevention Program (IBTPP); <http://www.infantbotulism.org/> .
  - 24/7 number is **510-231-7600**
  - [ibtpp@infantbotulism.org](mailto:ibtpp@infantbotulism.org)
- BabyBIG® has been shown to be most effective if given within 7 days of hospital admission. FDA approval of BabyBIG® was based upon studies that its use produced a statistically significant reduction in the durations of hospital stay, mechanical ventilation, and tube feeding.

### **Information Needed for the Investigation**

Infant botulism is the most commonly reported form of botulism in the United States. In Alaska four infants have been diagnosed with this disease; one case in 2009 occurred in an Alaska Native infant. In a study conducted outside of Alaska, affected infants had higher birth weights, their mothers tended to be Caucasian, and they were more commonly breast-fed.

In contrast to foodborne botulism where the toxin is ingested, infant botulism results from ingestion of *C. botulinum* spores with subsequent intestinal colonization and toxin production. Most infants affected by botulism are between 3 and 20 weeks of age. The first symptom is often constipation, followed in several days by progressive muscular weakness, poor suck, weak cry, and difficulty swallowing. Respiratory arrest occurs in half of affected infants. Numerous examples exist of infants presenting with apnea, or becoming apneic, during a diagnostic procedure. Examination may show a decreased gag reflex; cranial nerve involvement including ptosis, ophthalmoplegia, and facial nerve palsy; mydriasis; and areflexia and generalized hypotonia. Patients are usually afebrile and have normal cerebrospinal fluid. Electromyography may be helpful in differentiating botulism from other causes of neuromuscular disease.

## **Botulism, Intestinal (Infant)**

### **Verify the Diagnosis**

- Demonstration of botulinum toxin in stool and positive stool culture; unusual to find toxin in serum.

### **Laboratory Specimens**

- Collect bulk stool; send to ASPHL for direct toxin assay and culture.
- Environmental and food specimens usually not helpful; consult with California Department of Health Services prior to any collection efforts.

### **Contact and Control Measures**

- Not applicable.

### **Prevention**

- Approximately 20% of infant botulism cases reported to the CDC have been associated with the ingestion of honey. The sources for the other cases are unknown, but hypotheses include soil, household dust, and other foods. Honey should not be fed to infants less than 1 year of age. No other specific prevention measures exist.

### **Reporting Requirements**

- FTR: write up all *suspect* or *confirmed* cases
- AK-STARS Database: enter all *confirmed* cases
- CDC Case definition is used to define *confirmed* cases

**Alaska Section of Epidemiology (SOE)**

**Suspected Case(s) of Botulism and/or BAT™ Use Form**

**FAX to: Kelly Jackson**

**Fax#: 404-639-2205**

Date of fax: MM / DD / YYYY

Number of pages:

SOE contact person: \_\_\_\_\_

Phone number: ( \_\_\_\_ ) \_\_\_\_\_ - \_\_\_\_\_ Email: \_\_\_\_\_

	<b>Patient 1</b>	<b>Patient 2</b>
Patient Initials		
Age(s)		
Gender(s)		
Onset(s)		
Suspected type of botulism (foodborne, wound, other/unknown)		
Suspected vehicle		
Hospital Name		
Date antitoxin released		
Treating Physician Name		
Treating Physician Phone Number		
Lot #		

### Epi Bot Case Report / Assignment Form

Last Name \_\_\_\_\_ First Name \_\_\_\_\_ MI \_\_\_\_\_

Date of birth \_\_\_\_/\_\_\_\_/\_\_\_\_ Sex:  Female  Male Race:  Alaska Native/American Indian  Other: \_\_\_\_\_

Village: \_\_\_\_\_

Phones (home) \_\_\_\_\_

(cell) \_\_\_\_\_

(work) \_\_\_\_\_

Provider/Medical Facility: \_\_\_\_\_ Phone: \_\_\_\_\_

Date Reported: \_\_\_\_/\_\_\_\_/\_\_\_\_ Time Reported: \_\_\_\_\_

#### Disease Information

Suspect food(s): \_\_\_\_\_

Date(s) Eaten: \_\_\_\_/\_\_\_\_/\_\_\_\_ \_\_\_\_/\_\_\_\_/\_\_\_\_ \_\_\_\_/\_\_\_\_/\_\_\_\_

**Symptoms:**

- Blurred Vision       Slurred Speech       Difficulty Swallowing       Dry mouth
- Muscle Weakness       Drooping Eyelids       \_\_\_\_\_

BAT Recommended

BAT Administered    Date: \_\_\_\_/\_\_\_\_/\_\_\_\_    Time: \_\_\_\_\_    BAT kit # \_\_\_\_\_    BAT lot # \_\_\_\_\_

Patient Hospitalized \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

    Patient Transferred to \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

**Specimens:**

	Date Collected:	Date Shipped:	Result:
<input type="checkbox"/> Pre BAT serum:	____/____/____	____/____/____	_____
<input type="checkbox"/> Stool:	____/____/____	____/____/____	_____
<input type="checkbox"/> Gastric/emesis:	____/____/____	____/____/____	_____
<input type="checkbox"/> Suspect food(s):	____/____/____	____/____/____	_____
_____	____/____/____	____/____/____	_____
_____	____/____/____	____/____/____	_____

**Others who ate suspect food (Include all dates people are contacted for 10 days after eating suspect food\*):**

	ph: _____	Contacted by: _____	Dates _____
	ph: _____	Contacted by: _____	Dates _____
	ph: _____	Contacted by: _____	Dates _____

\*Initiate 10 day monitoring form: PHN \_\_\_\_\_ Dates: \_\_\_\_\_ CHA: \_\_\_\_\_

Comments: \_\_\_\_\_

**Notified:**

- PHN\*: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_
- OEH: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_
- ASPHL: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_
- CHAP: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_
- IP: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_
- Depot Restock \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_
- BAT release to CDC \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_
- Clinical outcome to CDC \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_
- Case report to CDC \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_
- Call lab at 855-222-9918 \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

**Assign to:**

- Peggy Cobey
- Donna Fearey
- Leslie Felts
- Karen Martinek
- Ginger Provo
- Kim Spink
- Louisa Castrodale
- \_\_\_\_\_

\* Request that PHN assume responsibility for 10-day monitoring of others who've eaten suspect food