Kansas
Department of Health and Environment
Division of Health

Botulism
Investigation Guideline

Contents

Revision History

Date	Replaced	Comments
07/2012	07/2009	Changed format. Added notification section. Updated fact sheet. Removed references to KS-EDSS.
10/2015	07/2012	Added table of contents and included notes on attachments. Updated links included the new CDC form with updates Case Investigation Section in reference to new form. Reformatted Standard Case Investigation section to assist with EpiTrax system data entry. Edits to Laboratory Analysis.
05/2018	10/2015	Updated case definition. Updated disease information. Updated notification section. Updated web links.
04/2022	05/2018	Disease Overview – Treatment: Added reference to new Clinical Guidelines for Diagnosis and Treatment of Botulism, 2021 | MMWR (cdc.gov). Updated notification section. Updated weblinks throughout. Checked accessibility.

Botulism
Disease Management and Investigation Guidelines

CASE DEFINITION (CDC 2011)

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.

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.

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

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.

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.

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.

(Note: “Other” Botulism includes iatrogenic botulism and adult intestinal colonization (adult intestinal toxemia).)

LABORATORY ANALYSIS

Important: Contact KDHE Bureau of Epidemiology and Public Health Informatics (BEPHI) (877-427-7317) by phone within 4 hours of a botulism case being suspected.

1) Infant Botulism: Physicians caring for infants will be referred to the *California Department of Public Health's Infant Botulism Treatment and Prevention Program* for consultation and possible receipt of anti-toxin. If anti-toxin is released for care, specimens should be sent to the *Centers of Disease Control (CDC*) for testing.
2) Specimens sent to *Centers of Disease Control (CDC*) for testing **require** prior authorization from Kansas Department of Health and Environment (KDHE).
   - Contact KDHE-BEPHI at 877-427-7317.
     - BEPHI will help to coordinate with the National Botulism Surveillance and Reference Laboratory through the CDC EOC at 770-488-7100.
   - Collect specimens early in the course of illness and do not delay transport.
   - Specimens include:
     - Serum: 10-15 ml preferred; as little as 0.5 ml can confirm, but in many cases volumes less than 3 ml will provide inconclusive results.
     - Feces: 25-50 gm collected, preferably before antitoxin treatment.
       (1) Confirmation has occurred with pea sized amounts.
       (2) If enema is required, use minimal amount of fluid.
       (3) Notify laboratory if patient is taking any medication that might interfere with toxin assays or culturing.
     - Vomitus or gastric contents.
     - Food specimen: minimum of 25-50 grams; left in original containers if possible or placed in sterile unbreakable containers and labeled. Empty containers with remnants of foods can sometimes be tested.
     - Wound Cultures: Use anaerobic transport devices such as Port-A-Cult tubes and send without refrigeration.
   - Label each specimen properly, including the date specimen collected.
   - Complete and submit a CDC Form 50.34 with the specimens.
   - Transport must not be delayed.
     - Package appropriately to meet transportation requirements.
     - Ship wound specimens at room temperature.
     - Ship all other specimens refrigerated (not frozen).
   - Label package with "MEDICAL EMERGENCY, BIOLOGICAL HAZARD, REFRIGERATE ON ARRIVAL".
     - Ship by the most rapid means available.
     - Notify the receiving laboratory in advance by telephone as to when and how specimens will be shipped, and when they will arrive.
   - For additional guidance: https://www.cdc.gov/botulism/botulism-specimen.html
   - For questions related to KHEL, call (785) 296-1620.

EPIDEMIOLOGY

Botulism occurs worldwide as sporadic cases, within family units and outbreaks. In the United States, an average of 24 foodborne, three wound and 71 infant botulism cases are reported annually. Black tar heroin use by intravenous drug users has led to an increase in the number of wound botulism cases.

DISEASE OVERVIEW

A. Agent:

Botulism is caused by a neurotoxin produced by *C. botulinum,* a spore-forming anaerobic bacillus bacterium. There are seven types of botulinum toxin (A-G); human botulism is caused by types A, B and E. The bacteria multiply under anaerobic and low acid conditions (i.e., pH ≤ 4).

B. Clinical Description:

Botulism is characterized by neurologic symptoms that include dysphasia, dry mouth, diplopia, dysarthia, ptosis and weakness. These symptoms are generally followed by a descending symmetrical flaccid paralysis beginning with the facial muscles. The case is usually alert. Mild constipation, vomiting or diarrhea may precede neurologic symptoms. The severity and rate of progression are dose dependent and only a few nanograms of botulism toxin are necessary to cause illness. Respiratory distress may occur if the muscles associated with breathing are compromised. Signs and symptoms of infant botulism include: constipation, lethargy, listlessness, difficulty feeding, weak cry, ptosis, loss of facial expression, dilated pupils, depression of deep tendon reflexes and generalized weakness often described as “floppy baby” syndrome.

Differential diagnoses to consider:

Differential Diagnoses for Adults:

- Guillain-Barre syndrome
- Myasthenia gravis
- Cerebrovascular accident (CVA)
- Bacterial and/or chemical food poisoning
- Tick paralysis
- Chemical intoxication (examples: carbon monoxide; opioid)
- Mushroom poisoning
- Poliomyelitis
- Psychiatric illness

Differential Diagnoses for Infants:

- Sepsis
- Meningitis
- Electrolyte-mineral imbalance
- Reye’s syndrome
- Congenital myopathy
- Werdnig-Hoffman disease
- Leigh disease

C. Reservoirs:

Spores associated with *C. botulinum* are found in soils worldwide and survive for an indefinite period under most environmental conditions.

D. Mode(s) of Transmission:

- **Foodborne botulism** is usually acquired by ingesting pre-formed toxin from food that has been inadequately processed and prepared. The most frequent source is home-canned foods.
- **Infant botulism** occurs as a result of ingestion of the spore form of the bacteria, which then germinate and produce toxin in the intestines. This happens through ingestion of food, soil or dust contaminated with *C. botulinum* spores; some cases of infant botulism have occurred in children living in areas of construction and earth disruption. Honey may contain *C. botulinum* spores.
- **Wound botulism** occurs when open wounds are contaminated with dirt or gravel containing botulism spores
- **Adult intestinal colonization** (also called adult **intestinal toxemia**) is an even rarer type of botulism. It involves intestinal colonization in a person older than one year of age. In the small number of these cases, most patients had a history of gastrointestinal surgery or illness, such as inflammatory bowel disease, which might have predisposed them to enteric colonization. No other specific risk factors have been identified.
- **Iatrogenic botulism** occurs after an overdose of injected botulinum toxin for cosmetic or medical purposes.

E. Incubation Period:

Shorter the incubation periods correlate to more severe the disease. Neurologic symptoms of foodborne botulism appear 12-72 hours after toxin ingestion (range of 2 hours to 8 days). The incubation period for intestinal botulism in infants is up to 30 days, but for adults is unknown. The median incubation period for wound botulism is generally 4-14 days. Incubation period of inhalation botulism is uncertain but may be like foodborne botulism.

F. Period of Communicability:

No instances of person-to-person spread been documented.

G. Susceptibility and Resistance:

Susceptibility is general. There is no resistance.

H. Treatment:

- Clinicians should **immediately contact KDHE at 1-877-427-7317** to report suspected cases. KDHE will arrange physician consultation with CDC.
- For infant botulism, physicians will be referred directly to the Infant Botulism Treatment and Prevention Program (IBTPP) on-call physician at (510) 231-7600) to arrange shipment of BabyBIG botulinal immune globulin.
  - Specimens still need to be sent to the CDC– See Laboratory Analysis.
- Prompt diagnosis and supportive treatment is essential. Antitoxin reduces the severity of symptoms, if administered early.
  - Antitoxin for infant botulism is maintained by the California Department of Public Health's Infant Botulism Treatment and Prevention Program, and
  - Antitoxin for non-infant kinds of botulism is maintained by the CDC.
- Additional guidance on diagnosis, treatment and considerations for handling antitoxin shortages: Clinical Guidelines for Diagnosis and Treatment of Botulism, 2021 | MMWR (cdc.gov)

NOTIFICATION TO PUBLIC HEALTH AUTHORITIES

Suspected cases of botulism shall be reported within four hours of knowledge of the suspected case, regardless of the presence of laboratory evidence:

1. Health care providers and hospitals: report to the local public health or KDHE.
2. Local public health jurisdiction: report to KDHE-BEPHI (see below).
3. Laboratories: report to KDHE-BEPHI (see below).

Kansas Department of Health and Environment (KDHE)
Bureau of Epidemiology and Public Health Informatics (BEPHI)
Phone: 1-877-427-7317

Further responsibilities for reporting to the CDC:

When contacted by a physician of a suspected case, KHDE will do the following:

1) Infant botulism:

- KDHE will refer the physician to the Infant Botulism Treatment and Prevention Program (IBTPP) on-call physician at (510) 231-7600.
- KDHE will encourage the collection and shipment of specimens to CDC for testing for all instances where anti-toxin is released form IBTPP.
- **EXTREMELY URGENT**: When a cluster or outbreak of infant botulism is suspected, KDHE must call the CDC EOC at 770-488-7100 within 4 hours of suspicion.
- Sporadic infant botulism cases are reported by routine electronic reporting through the state surveillance system.

2) Other forms of botulism (non-infant):

- KDHE will notify the CDC EOC at 770-488-7100 of testing requests and will arrange for a physician consultation with CDC.
- KDHE will communicate with the physician consulting with CDC to record consultation results, if antitoxin was released and administered, and if specimens are being sent to the CDC.
- **EXTREMELY URGENT**: For cases of "foodborne", "intentional", or "unknown etiology" (i.e., not sporadic wound or non-outbreak related infant cases), KDHE must call CDC EOC at 770-488-7100 within 4 hours of suspicion.
- "Sporadic wound" cases are reported by routine electronic reporting through the state surveillance system.

Further guidance on the process to provide verbal notification to the CDC Emergency Operations Center (EOC) can be referenced at Process statement 09-SI-04 for Immediately Nationally Notifiable Conditions (word document from cdc.gov).

INVESTIGATOR RESPONSIBILITIES

1) Suspect botulism in the following scenarios:
   - Adults with acute onset of gastrointestinal, autonomic (dry mouth, blurry vision) and cranial nerve dysfunction (diplopia, dysarthria, dysphagia).
   - Infants (<1 year) with poor feeding, diminished sucking and crying ability, neck and peripheral muscle weakness, or respiratory distress.
2) Report all confirmed, probable and suspect cases to the KDHE-BEPHI.
   - Additional notifications will occur as described above.
3) Begin the public health investigation within 1 day of receiving a report; completing the investigation within 3 days.
4) Conduct a case investigation to identify potential source of infection.
   - Review any initial information collected and then contact the medical provider to collect additional information needed to confirm diagnosis using current case definition.
   - The method of case investigation depends on the type of botulism.
     - Foodborne botulism should be considered a public health emergency with ample resources allocated to the investigation.
       - Suspicion is increased if an adult has recently eaten home-canned foods or if meal companions are similarly ill.
       - If the typical syndrome is present and no food item can be pinpointed, the possibility of a contaminated wound should be examined.
     - Wound botulism should be investigated to determine the site of the wound and how it happened. If illicit drug use is suspected and additional cases are possible, notify KDHE.
     - If no wound or food source is identified, notify KDHE.
   - Attach copies of medical records to the case in EpiTrax.
5) Identify whether the source of infection is major public health concern.
   - *Commercially available food, bioterrorism or mass exposure indicated?*
6) Conduct contact investigation to identify additional cases, as needed.
7) Initiate control and prevention measures to prevent spread of disease.
8) Conduct Case or Contact Management as needed.
9) Record data, collected during the investigation, in the KS EpiTrax system under the data's associated [tab] in the case morbidity report (CMR).
10) As appropriate, use the disease fact sheet for notification and education.

As necessary, the local public health official may also need to:
- Consult with KDHE about the need for botulism antitoxin therapy, and
- Assist with the logistics of antitoxin delivery.

STANDARD CASE INVESTIGATION AND CONTROL METHODS

Case Investigation

1) Consult with a KDHE Epidemiologist to determine what information has already been collected; and, as necessary, contact the medical provider who ordered testing or antitoxin to obtain additional information. If hospitalized: obtain admission/progress notes and discharge summary.
   - Use the rapid assessment form to record the following:
     - Onset date and hour of first neurological sign or, for foodborne, onset date and hour of first gastrointestinal symptom.
     - Signs and symptoms.
     - Progression of muscle weakness and paralysis.
   - Review laboratory testing that has already been done; specimens that have been or should be collected; ensure proper notifications occurred for submitting specimens to the CDC.
     - Initial laboratory testing is used for differential diagnosis and may provide useful data. Botulism is usually (but not always) characterized by:
       - Normal CSF examination (CSF protein may be slightly elevated);
       - Normal/negative Tensilon (edrophonium) test;
       - Normal neuroradiologic studies;
       - Electrodiagnostic tests (repetitive nerve stimulation (RNS), electromyography (EMG), and nerve conduction studies (NCSs)) conducted and interpreted by an experienced person as indicative of botulism.
     - Specimens that can be sent to CDC after approval include:
       - Pretreatment serum for toxin;
       - Gastric aspirate for anaerobic culture and toxin;
       - Stool for anaerobic culture and toxin;
       - Food item, for anaerobic culture and toxin;
       - Wound aspirate for anaerobic culture and toxin;
       - Biopsy of abscess for anaerobic culture and toxin;
       - Post-treatment serum for toxin (in wound botulism only).
   - Presumptive (initial) Diagnosis Date and final Diagnosis Date.
   - Hospitalizations: location and duration of stay.
   - Pregnancy.
   - Illness outcomes:
     - Recovered or date of death.
     - Treatment with botulinum antitoxin; date treatment started.
     - Was patient intubated or placed on ventilator?
   - Collect case's demographics and contacting information (address, birth date, gender, race/ethnicity, primary language, and phone number(s)).

2) Interview the case or proxy to determine source and risk factors; focus on incubation period based on the type of botulism.
   - Occupation; specific job duties, industry type and location.
   - Travel history prior to onset.
   - Additional information to collect will depend on type of botulism.

Foodborne Botulism (including intestinal toxemia in adults)

- Focus on a period of time, 8 days before illness onset. Suspect foods are usually eaten less than 2 days before onset and are low in acid (including vegetables, fish, and meat).
- Identify any history of abdominal surgery, gastrointestinal tract abnormalities, Crohn's disease, or recent treatment with antibiotics.
  - Cases older than 1 year of age with any of these risk factors may be experiencing ***intestinal toxemia*** as altered intestinal flora makes them vulnerable to the same *C. botulinum* spore sources as infants.
  - For such cases, a food source may not ever be identified and is most likely not a risk to other individuals.
- Collect Information on unusual/high risk food items that were consumed:
  - Home-canned foods.
  - Commercially canned foods.
  - Sausage and other preserved meat that is not adequately refrigerated.
  - Preserved fish.
  - Items stored in oil (e.g. onions, garlic) or foil (e.g. baked potatoes).
- For highly suspected food items, report:
  - When were the items consumed? (Date/time)
  - Did / could others eat the same food? (Note number exposed and ill.)
  - Where was food obtained? (home, commercial, restaurant, other)
  - For commercial foods: determine the brand, manufacturer, package size, lot number, and place and date of purchase.
- A home visit may be required if source is not readily apparent or if remaining jars of home-canned foods need to be collected.

Wound Botulism

- Focus on a period of time, 2 weeks before illness onset.
- Site of wound/ reason; date of injury.
- History of illicit drug use. (Type and mode of use.)
- For additional information, refer to Additional Information / References.

Infant Botulism

- Collect general about infant's diet including formula, pacifier and antibiotic use and environmental exposures.

Other Botulism

- Record all information collected in the course of the investigation to rule-out other forms of botulism (foodborne, wound, intestinal).
- Further steps are determined after consultation with KDHE-BEPHI.

3) Based on epidemiological information, record where the infection was most likely from. (Indigenous or out-of-county, out-of-state, or out-of-U. S.)
4) Collect information from case for the Contact Investigation. (See below.)
5) Investigate epi-links among cases (clusters, household, co-workers, etc).
   - Highly suspected food source should be investigated. Refer to Environmental Measures.
6) For suspected outbreaks to Managing Special Situations section.

Contact Investigation

1) For infant botulism, intestinal toxemia (adults with altered intestinal flora placing them at risk of botulism), and iatrogenic botulism, no contact investigation is necessary.
2) For wound botulism, no contact investigation is usually necessary – unless a common source such as a contaminated drug may have been used by others.
3) For foodborne botulism, until a specific food item has been incriminated, anyone who has shared food with a case within 5 days prior to onset of symptoms should be considered a contact. Once a food has been identified only those known to have eaten the implicated food are considered contacts.
4) Review the patient's food intake history collected during the case investigation and determine the most likely source of intoxication. If a risk of transmission exists create a listing of contacts at-risk of developing disease in EpiTrax.
5) Obtain the following information from the patient:
   - Telephone numbers and names of persons who may have eaten the suspected food item.
   - Obtain the name, address, and telephone number of every person who may have the suspect home-processed food in his or her possession.
   - Enter contacts who consumed the food item on the [Contact] tab, indicate the disposition of contact (treatment or infection status), and contact type.
   - After the CMR is saved and updated successfully, click 'Edit' beside the contact on the listing to enter any further details on the contact.
6) Follow-up with at-risk contacts as instructed in Contact Management.

Isolation, Work and Daycare Restrictions

In general, there is no isolation or restriction measures for those with botulism, but Kansas Food Code should always be enforced for excluding food handlers with gastrointestinal symptoms.

Case Management

1) Report on any changes in patient status (i.e., discharge, death).
2) The person who prepared any suspect home-canned food should be instructed in proper canning techniques.

Contact Management

1) If within six hours of exposure, other persons who have eaten implicated food should be purged and given gastric lavage to remove unabsorbed toxin.
2) All contacts should be monitored for signs of botulism at least twice daily for three days and instructed to seek medical care immediately should symptoms.
3) Update the [Contact] tab, as needed.

Environmental Measures

1) Implicated food items must be removed from the environment and destroyed.
2) A decision about testing implicated food items can be made in consultation with the state epidemiologist.
3) If a commercial product or medical/cosmetology service is suspected, a detailed trace back investigation may need to occur. The state health department will coordinate follow-up with relevant outside agencies.

Education

1) Physicians and medical providers: refer medical providers to:
   - Clinical Guidelines for Diagnosis and Treatment of Botulism, 2021 | MMWR (cdc.gov);
   - Resources & Publications | Botulism | CDC (administration of antitoxin video).
2) Home-canning education, consult:
   - K-State Extension Canning (k-state.edu)
   - USDA Home Canning Guide National Center for Home Food Preservation | USDA
   - CDC resources Home-Canned Foods | Botulism | CDC
3) Persons who consume homemade alcohol:
   - Pruno: A Recipe for Botulism | Botulism | CDC
4) To handle increases in cases of wound botulism associated with illicit drug use, it may be necessary to use press releases and provided informational materials to physicians and organizations who provide outreach to drug users.
   - Injection Drug Use and Wound Botulism | Botulism | CDC

MANAGING SPECIAL SITUATIONS

Outbreak Investigation

11) Outbreaks have been reported with:
    - Ingestion of contaminated food (foodborne botulism)
    - Illicit drug use with black tar heroin (wound botulism)
12) A foodborne disease outbreak is defined as an incident in which two or more persons experience a similar illness after ingestion of a common food, and epidemiologic analysis implicates the food as the source of the illness. .
13) Other outbreaks may be defined as unexplained, unexpected increase in botulism cases that are clustered in person, place, or time.
14) Notify KDHE immediately, 1-877-427-7317.
15) Additional resource: Foodborne Disease Outbreak Investigation and Surveillance Tools | Foodborne Outbreaks | Food Safety | CDC

Intentional Contamination or Bioterrorism

Botulism toxin is a category B biological warfare agent. An attack may take the form of dissemination of an aerosol among a gathering of a large number of people or by the contamination of food or water. Features of an outbreak that would suggest a deliberate release of botulinum toxin, include:

1. Outbreak of a large number of cases of acute flaccid paralysis with prominent bulbar palsies.
2. Outbreak with an unusual botulinum toxin type – type C, D, F, or G, or type E toxin that was not acquired from an aquatic food).
3. Outbreak with a common geographic factor among cases but without a common dietary exposure (features suggestive of an aerosol attack).
4. Multiple simultaneous outbreaks with no common source.

***Note**: Collect a careful travel, activity, and dietary history on case-patient and ask about other persons with similar symptoms.*

If an intentional release is suspected:

1) Notify local law enforcement and state public health officials.
2) Implement "Chain of Custody | KDHE, KS" procedures for all samples collected, as they will be considered evidence in a criminal investigation.
3) Work to define population at risk which is essential to guide response activities. Public health authorities will play the lead role in this effort, but must consult with law enforcement, emergency response and other professionals. Re-evaluate and redefine at various points in the response.
4) Once the mechanism and scope of delivery has been defined, identify symptomatic and asymptomatic individuals among the exposed and recommend treatment or medical monitoring for surveillance.
5) Establish and maintain a detailed line listing of all cases and contacts with accurate identifying and locating information.

Safety Considerations:

- Risks to public health, health care and emergency response personnel are not significant. Standard infection control precautions in hospitals.

Risk Communications:

- Use fact sheets and press releases to inform public and stakeholders.

Vaccine

- In the U.S., an investigational pentavalent (ABCDE) botulinum toxoid is used by laboratory workers at high risk of exposure to botulinum toxin and by the military for protection of troops against attack.
- Mass immunization is neither feasible nor desirable for reasons that include scarcity of the toxoid, rarity of natural disease, and elimination of the potential therapeutic benefits of medicinal botulinum toxin.
- Pre-exposure immunization is neither recommended for nor available to the general population.

Postexposure prophylaxis (PEP):

- Use of antitoxin for postexposure prophylaxis is limited by its scarcity.
- Therefore, the most prudent measure would be for asymptomatic persons who have been potentially exposed to remain under close medical observation, and, if feasible, near critical care services.
- Botulinum toxoid is not effective as post-exposure prophylaxis as it immunity is induced over several month period.

Decontamination

- Food and drink: heating to an internal temperature of 85°C for at least 5 minutes will detoxify contaminated food or drink. All foods suspected of contamination should be removed from use and submitted to public health authorities for possible testing using the chain of custody procedures.
- Clothing and skin: After exposure to toxin, wash with soap and water. Protect mucosal surfaces when removing clothing. Intact skin is impermeable to toxin; while mucosal surfaces are not.
- Contaminated objects or surfaces should be cleaned with 0.1% hypochlorite bleach solution if they cannot be avoided for the hours to days required for natural degradation.
- Natural degradation: Determined by atmospheric conditions and the particle size of the aerosol; aerosolized toxin has been estimated to decay between <1% to 4% per minute. At a decay rate of 1% per minute, substantial inactivation of toxin occurs by 2 days after aerosolization.

Surveillance:

- Arrange for active surveillance of signs or symptoms of botulism in the population at risk for 2 weeks after exposure.

For additional information on treatment, incubation period and diagnosis refer to previous sections.

For more details on subjects mentioned above, refer to Botulinum Toxin as a Biological Weapon: Medical and Public Health Management | Infectious Diseases | JAMA | JAMA Network

DATA MANAGEMENT AND REPORTING TO THE KDHE

A. Accept the case assigned to the LHD and record the date the LHD investigation was started on the [Administrative] tab.

B. Organize and collect data, using appropriate data collection tools including:
- The Botulism Rapid Assessment Form can be used to collect information.
- Alternatively, investigators can collect and enter all required information directly into EpiTrax [Investigation], [Clinical], [Demographics], [Epidemiological] tabs.
- During outbreak investigations, refer to guidance from a KDHE epidemiologist for appropriate collection tools.

C. Report data collected during the investigation via EpiTrax**.**
- Verify that all data requested on the Botulism Rapid Assessment Form has been recorded on an appropriate EpiTrax [tab], or that actions are completed for a case lost to follow-up as outlined below.
- Some data that cannot be reported on an EpiTrax [tab] may need to be recorded in [Notes] or scanned and attached to the record.
- Paper report forms do not need to be sent to KDHE after the information is recorded and/or attached in EpiTrax. The forms should be handled as directed by local administrative practices.

D. If a case is lost to follow-up, after the appropriate attempts to contact the case have been made:
- Indicate 'lost to follow-up' on the [Investigation] tab with the number of attempts to contact the case recorded.
- Record at least the information that was collected from the initial reporter.
- Record a reason for 'lost to follow-up' in [Notes].

E. Once the investigation is completed, the LHD investigator will record the date the investigation was completed on the [Administrative] tab and click the "Complete" button. This will trigger an alert to the LHD Administrator so they can review the case before sending to the state.
- The LHD Administrator will then "Approve" or "Reject" the CMR.
- Once a case is "Approved" by the LHD Administrator, BEPHI staff will review and close the case after ensuring it is complete and that the case is assigned to the correct event, based on the reported symptoms reported. (Review the EpiTrax User Guide (ks.gov) for further guidance.)

Notes on classification/reporting of cases:

Case description	Report as
< 1 year of age.	Botulism, Infant
≥ 1 year of age and consumed suspected food item	Botulism, Foodborne
≥ 1 year of age no food association but has wounds	Botulism, Wound

- After a detailed investigation with no associated food, wound, or age identified; classify / report the case as "Botulism, Other".

ADDITIONAL INFORMATION / REFERENCES

A. Case Definitions: CDC Division of Public Health Surveillance and Informatics, Available at: https://ndc.services.cdc.gov/

B. Kansas Regulations/Statutes Related to Infectious Disease: https://www.kdhe.ks.gov/1517/Regulations-Related-to-Infectious-or-Con

C. Wound Botulism Additional Information:

- CDC MMWR Wound Botulism -- California, 1995: www.cdc.gov/mmwr/preview/mmwrhtml/00039732.htm
- CDC MMWR Wound Botulism Among Black Tar Heroin Users --- Washington, 2003: www.cdc.gov/mmwr/preview/mmwrhtml/mm5237a3.htm
- Yuan J, et al. Recurrent wound botulism among injection drug users in California. Clin Infect Dis. 2011. http://cid.oxfordjournals.org/content/52/7/862.short

D. Additional Information (CDC):

- Website: https://www.cdc.gov/botulism/index.html
- Botulism: Handbook for Epidemiologists, Clinicians & Laboratory Workers (1998): https://www.cdc.gov/botulism/pdf/bot-manual.pdf

Botulism Rapid Assessment Worksheet

(Please refer to the Disease investigation Guideline for additional guidance.)

Symptom Information (Highlighted * are typical of botulism. Those marked with an (I) are associated to infant botulism.)

Symptoms	Yes	No	Unk.
Alert and oriented *			
Ataxia (lack of coordination) NOT present			
Dilated pupils (I)			
Diminished /absent deep tendon reflexes (I)			
Dizziness not present			
Double or blurry vision *			
Droopy eyelids *			
Dry mouth *			
Dysphagia (Trouble swallowing) *			
Dysphonia (Speech difficulty) *			
Muscle Weakness *			
Parasthesia (tingling/numbness) NOT present			
Sensation to touch/vibration normal			
Vomiting			
Diarrhea			
Constipation (I)			
Afebrile (fever not present)			

Comments / Specifics

* Typical Symptoms or signs.

Details and progression of muscle weakness or paralysis

- ❑ Bilateral cranial nerves affected *
- ❑ Symmetrical *
- ❑ Descending (beginning with cranial) *
- ❑ Ascending (ending with cranial)
- ❑ Ventilatory Distress or Compromise

	Onset Date	Onset Hour
First neurologic symptom:		
First GI Symptom:		

Initial Laboratory Testing

CSF Findings

WBC count (Highest) _____

Protein (Highest) _____

Opening pressure _____

	Normal	Abnormal	Not Done
Tensilon	❑	❑	❑
Neuroradiologic studies	❑	❑	❑

EMG Test Result:
(repetitive stimulation is recommended)

- ❑ Suggestive /consistent with botulism
- ❑ Not consistent with botulism
- ❑ Not done

Initial Information to Collect (for those over the age of 1 year)

Initial questions	Yes	No	Unk.	If yes, comments / specifics
Does the patient have a history of ingesting any unusual/high risk food items? (examples: home-canned food, commercially canned food, sausage or other preserved meats, preserved fish, items stored in oil, baked potato stored in foil)				Suspect Food: Date/Time Eaten: Anyone else consumed:
Does the patient have any visible wounds?				Site of wound/reason: Date of injury:
Does the patient have any history of abdominal surgery, gastrointestinal tract abnormalities, Crohns disease or recent treatment with antibiotics that would put them at risk of intestinal botulism?				
Does patient have a history of illicit drug use?				Type & mode of use (i.e. infection, skin popper):