UTAH DEPARTMENT OF HEALTH

Report Immediately

Botulism (*Clostridium botulinum*)

Disease Plan

Quick Links

Last updated: December 28, 2021, by Delaney Moore.

Questions about this disease plan?

Contact the Utah Department of Health Bureau of Epidemiology: 801-538-6191.

✓ CRITICAL CLINICIAN INFORMATION

Clinical Evidence
Signs/Symptoms • Most common symptoms include blurred or double vision, dysphagia, dry mouth, and muscle weakness. • Symmetric, descending flaccid paralysis is classic for botulism.
Period of Communicability • No instances of person-to-person spread have ever been documented for botulism.
Incubation Period • Foodborne botulism: range of 2 hours to 8 days (average of 12-36 hours) after eating contaminated food • Wound botulism: range of 4-14 days (average of 7 days)
Mode of Transmission • Ingestion of or wound infection with toxin produced by *C. botulinum* spores.
Laboratory Testing
Type of Lab Test/Timing of Specimen Collection • Botulism can be diagnosed by culturing the organism itself or by identifying its toxin. • Botulism testing can only be performed at the Utah Public Health Lab and must be approved by the Utah Department of Health Bureau of Epidemiology.
Type of Specimens • Foodborne botulism, culture – gastric aspirate or stool • Foodborne botulism, toxin neutralization – serum, stool, gastric aspirate, or incriminated food • Wound botulism, culture – clinical specimen from the wound • Wound botulism, toxin neutralization – serum
Treatment Recommendations
Type of Treatment • Equine-derived botulinum antitoxin is available through the CDC, but must be ordered through the state health department. • Supportive care in a hospital, including wound treatment as needed, is the mainstay of botulism therapy.
Time Period to Treat • Antitoxin needs to be administered as soon as possible and should not be withheld pending laboratory confirmation.
Prophylaxis • None
Contact Management
Isolation of Case • None
Quarantine of Contacts • None
Infection Control Procedures
• Standard precautions

✓ WHY IS BOTULISM IMPORTANT TO PUBLIC HEALTH?

Botulism is a severe poisoning caused by *C. botulinum* toxin. There are four types of botulism that occur in those >1 year of age: foodborne botulism, wound botulism, adult intestinal toxemia, and iatrogenic botulism. Foodborne botulism is the most common, followed by wound botulism. Symptoms are typically neurological and include blurred or double vision, dysphagia, dry mouth, muscle weakness, and descending, symmetric paralysis. Patients usually require ventilatory support and recovery can take weeks to months. Treatment consists of supportive care in a hospital and, if possible, botulism antitoxin. Although botulism cannot spread from person to person, the illness is very severe and all efforts must be made to find and remove the original source of infection to prevent others from becoming ill.

✓ DISEASE AND EPIDEMIOLOGY

Clinical Description

Foodborne botulism

Foodborne botulism is a severe poisoning caused by ingestion of pre-formed *C. botulinum* toxin. The clinical syndrome is dominated by neurologic signs and symptoms, including blurred or double vision, dysphagia, dry mouth, and muscle weakness. Symmetric, descending flaccid paralysis is classic for botulism. Generally, paralysis first affects the cranial nerves, followed by the upper extremities, the respiratory muscles, and finally, the lower extremities. Patients usually require ventilatory support, which is commonly needed for 2-8 weeks. The clinical symptoms are similar no matter which toxin type is responsible for the illness, but type A has been associated with a higher case-fatality rate than types B or E.

Wound botulism

Wound botulism usually presents with the same clinical picture as foodborne botulism. In wound botulism, the organism multiplies in the wound and produces the toxin, which is then absorbed into the bloodstream.

Adult intestinal toxemia

Adult intestinal toxemia (or adult intestinal colonization) is a very rare kind of botulism that can happen if the spores of the bacteria get into an adult's intestines, grow, and produce the toxin (similar to infant botulism). This kind of botulism is more likely to occur in people who have serious health conditions that affect the gut.

Iatrogenic botulism

Iatrogenic botulism can occur if too much botulinum toxin is injected for cosmetic or medical reasons. Like adult intestinal toxemia, this is a very rare kind of botulism.

Causative Agent

Botulism is caused by a potent neurotoxin produced by *Clostridium botulinum*, an anaerobic, spore-forming bacterium. While the bacterium itself is harmless, *C. botulinum* toxin is one of the most potent, lethal substances known. There are seven types of botulinum toxins (A-G), but human botulism is primarily caused by types A, B, E, and F.

Differential Diagnosis

Other conditions and diseases that may have similar symptoms to botulism are drug or chemical poisoning, Guillain-Barré syndrome, myasthenia gravis, paralytic shellfish poisoning, mushroom poisoning, tick paralysis, poliomyelitis, and stroke.

Laboratory Identification

Botulism diagnosis can be confirmed by culturing the organism itself or by identifying its toxin. In early cases, diagnosis is more likely made by toxin assay, whereas persons in the later stages of disease are more likely to be culture positive.

Culture

Appropriate specimens are:

- Foodborne botulism – gastric aspirate or stool
- Wound botulism – clinical specimen from the wound.

Toxin neutralization

Botulinum toxin in the patient's serum or stool is demonstrated by a toxin neutralization bioassay in mice. This is performed by injecting serum or buffered supernatant from stool into mice and looking for signs of botulism.

- Foodborne botulism – serum, stool, gastric aspirate, or incriminated food
- Wound botulism – serum.

The Utah Public Health Laboratory (UPHL) is the only laboratory in Utah that offers botulism testing.

Testing Protocol

Botulism testing is time, labor, and resource intensive. Unlike other laboratory tests, the test for botulism is not generally used as a rule-out test. While botulism testing is highly specific, sensitivity is quite low. This means that a positive test can be interpreted as a positive in almost all cases, but a negative test is not conclusive. Test sensitivity is decreased when specimen collection is delayed. UPHL depends on the Utah Department of Health Bureau of Epidemiology (BOE) to screen botulism test requests for adults for clinical compatibility with botulism. The BOE approves test requests after consultation with the physician, UPHL, and the Centers for Disease Control and Prevention (CDC). In addition, testing is typically only approved when the physician plans to administer botulism antitoxin.

> *Note: Infant botulism is an exception to this rule. If testing is requested by a physician for a child <1 year of age, UPHL typically performs the test and informs the BOE that testing is being conducted. See the Infant Botulism Disease Plan for more detail.*

Treatment

If diagnosed early, foodborne and wound botulism can be treated with equine-derived botulinum antitoxin that blocks the action of toxin circulating in the blood. This can prevent patients from worsening, but does not reverse damage, and recovery still takes many weeks. The Enteric Disease Epidemiology Branch at the CDC consults with state health departments on antitoxin release and can be reached through the Emergency Operations Center at 770-488-7100. The decision to administer antitoxin should not wait for laboratory confirmation.

Physicians may try to remove contaminated food still in the gut by inducing vomiting or by using enemas. Wounds should be treated, usually surgically, to remove the source of the toxin-producing bacteria. Good supportive care in a hospital is the mainstay of therapy for all forms of botulism.

See the Infant Botulism Disease Plan for more details on treating infant botulism.

Case Fatality

The case fatality rate for botulism is estimated at 10-46%, depending on when and if antitoxin is administered. In general, the case fatality rate for foodborne botulism is 5-10%.

Reservoir

Clostridium botulinum spores are ubiquitous in the environment. The spores can survive indefinitely in soil under almost any environmental condition. Spores are also found in marine sediment. Spores only grow and produce toxins under specific conditions.

Transmission

Generally, botulism is not communicable from person-to-person. However, minute quantities of the toxin acquired by ingestion, inhalation, or by absorption through the eye or a break in the skin can cause botulism. All materials suspected of containing botulinum toxin must be handled with caution.

Foodborne botulism

Foodborne botulism is acquired by ingesting toxin produced when *C. botulinum* spores germinate in inadequately processed and prepared food. The most frequent source of foodborne botulism is home canned foods. The toxin is destroyed by boiling.

Wound botulism

Wound botulism is most frequently reported among chronic injection drug users. Wound botulism also occurs when dirt or gravel containing *C. botulinum* spores germinate and produce toxin within the wounds.

Susceptibility

Anyone can get botulism. Botulism does not result in immunity.

Incubation Period

The incubation period is variable depending on the form of botulism. Generally, the shorter the incubation period, the more severe the disease.

Foodborne botulism

Range of 2 hours to 8 days (average of 12-36 hours) after eating contaminated food.

Wound botulism

Range of 4-14 days (average of 7 days).

Period of Communicability

No instances of person-to-person spread have ever been documented for botulism.

Epidemiology

Botulism occurs worldwide as sporadic cases and as family and general outbreaks. Since 1994, the use of black tar heroin by injection drug users has been associated with an increase in the number of cases of wound botulism. Utah has seen sporadic cases of foodborne botulism related to canned green beans and beet soup. In 2011, there was an outbreak of foodborne botulism associated with “pruno”, an illicit alcoholic beverage brewed by incarcerated persons.

✓ PUBLIC HEALTH CONTROL MEASURES

Public Health Responsibility

- Investigate all suspect cases of disease and fill out and submit appropriate disease investigation forms.
    - Botulism is a Category A bioterrorism agent.
- Provide education to the general public, clinicians, and first responders regarding disease transmission and prevention.
- Identify clusters or outbreaks of this disease and determine the source.
- Identify cases and sources to prevent further transmission.

Prevention

Environmental Measures

Implicated food items must be removed from consumption. A decision about testing implicated food items can be made in consultation with the enteric epidemiologist at UDOH, UPHL, and CDC. The general policy of UPHL is to test only food samples implicated in suspected outbreaks; however, in cases of botulism, testing food implicated in a single case is recommended.

Personal Preventive Measures/Education

To avoid exposure to botulism, persons should:

- Be educated about the proper time, pressure, and temperature required to destroy spores if they are interested in home-canning and other food preservation techniques.

- Consider boiling canned foods for 10 minutes before eating it to ensure safety.
- Not open bulging containers and not eat or even "taste-test" foods with off odors.
- Promptly seek medical care for infected wounds.
- Not use injectable street drugs.

Note: Instructions on safe home canning can be obtained from the U.S. Department of Agriculture.

Chemoprophylaxis

Persons known to have eaten the same contaminated food as the case should be purged with cathartics, given gastric lavage and high enemas, and kept under close medical observation. Administration of antitoxin prophylactically is generally not recommended. A decision to release botulinum antitoxin for persons with a plausible epidemiologic link to a botulism case will be made in consultation with CDC.

Vaccine

None.

Isolation and Quarantine Requirements

Isolation: None.

Hospital: Standard Precautions

Quarantine: None

✓ CASE INVESTIGATION

Reporting

Report any illness to public health authorities that meets any of the following criteria:

1. A person for whom a diagnostic test specific for botulism has been ordered.
2. A person for whom antitoxin specific for botulism has been ordered.
3. A person with *at least one* of the clinical presentations in Table 1 AND who has ingested the same food as persons who have laboratory-confirmed botulism.
4. A person with at least one of the clinical presentations in Table 1 AND at least one of the historical findings in table 1.
5. A person whose healthcare record contains a diagnosis of botulism.
6. A person whose death certificate lists botulism as a cause of death or a significant condition contributing to death.

Other recommended reporting procedures:

- All cases of botulism should be reported according to state regulations.
- Reporting should be on-going and routine.
- Reporting should be immediate

In addition to notifying state public health authorities, botulism also needs to be reported to the CDC by the state health department immediately in the following circumstances:

1. Cases of foodborne botulism, except those that are endemic to Alaska.
2. Cases of botulism suspected to result from an intentional release of botulinum toxin.
3. Cases involved in clusters or outbreaks of infant botulism.
4. Cases that are of unknown etiology or do not otherwise meet criteria for standard notification.

Sporadic cases or clusters of wound botulism do not need to be immediately reported to CDC, but should be reported as soon as possible.

Table 1: Criteria to determine whether a case should be reported

Criterion	**Reporting**		
Historical Evidence			
History of a fresh, contaminated wound during the two weeks before onset of symptoms			O
Ingestion of home-canned food within the 48 hours before onset of symptoms			O
History of injection drug use within the two weeks before onset of symptoms			O
Clinical Evidence			
Diplopia (double vision)		O	O
Blurred vision		O	O
Bulbar weakness		O	O
Impaired respiration		O	O
Progressive weakness		O	O
Progressive symmetric paralysis		O	O
Healthcare record contains a diagnosis of botulism	S		
Death certificate lists botulism as a cause of death or a significant condition contributing to death	S		
Laboratory Evidence			
Detection of botulinum toxin in serum	S*		
Detection of botulinum toxin in stool	S*		
Detection of botulinum toxin in patient's food	S*		
Isolation of *Clostridium botulinum* from stool	S*		
Isolation of *Clostridium botulinum* from wound	S*		
Epidemiologic Evidence			
Ingestion of the same food as persons who have laboratory-confirmed botulism		N	
Special Criteria			
Request for anti-toxin specific for botulinum toxin	S*		

Notes:

S = This criterion alone is Sufficient to identify a case for reporting.

N = All "N" criteria in the same column are Necessary to identify a case for reporting.

O = At least one of these "O" (Optional) criteria in each category (i.e., clinical evidence and laboratory evidence) in the same column—in conjunction with all "N" criteria in the same column—is required to identify a case for reporting. (These optional criteria are alternatives, which means that a single column will have either no O criteria or multiple O criteria; no column should have only one O.)
* A requisition or order for any of the "S" laboratory tests is sufficient to meet the reporting criteria.

CSTE Case Definition
Botulism 2010

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, 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 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.

Table 2: Criteria for defining a case of botulism

Criterion	**Reporting**		
Historical Evidence	**Confirmed**		**Probable**
History of a fresh, contaminated wound during the two weeks before onset of symptoms	O3,A4		
Ingestion of home-canned food within the 48 hours before onset of symptoms	A3,A4		N1,A3
History of injection drug use within the two weeks before onset of symptoms	O3		O3
Clinical Evidence			
Diplopia (double vision)	O1,O3,O4	O1	O1,O3,O4
Blurred vision	O1,O3,O4	O1	O1,O3,O4
Bulbar weakness	O1,O3,O4	O1	O1,O3,O4
Impaired respiration	O2		O2
Progressive weakness	O2		O2
Progressive symmetric paralysis	O1,O3,O4	O1	O1,O3,O4
Laboratory Evidence			
Detection of botulinum toxin in serum	O1-O4	O1	
Detection of botulinum toxin in stool	O1,O2,O4	O1	
Detection of botulinum toxin in patient's food	O1,O4	O1	
Isolation of *Clostridium botulinum* from stool	O1,O2,O4	O1	
Isolation of *Clostridium botulinum* from wound	O3,O4		
Epidemiologic Evidence			
Ingestion of the same food as persons who have laboratory-confirmed botulism	A3,A4	O1	
Special Criteria			
Age < 1 year	N2,A4		

Notes:

N = All "N" criteria in the same column are Necessary to classify a case.

A = This criterion must be absent (i.e., NOT present) for the case to meet the classification criteria.

O = At least one of these "O" (Optional) criteria in each category (i.e., clinical evidence and laboratory evidence) in the same column—in conjunction with all "N" criteria in the same column—is required to classify a case.
1 = Foodborne botulism
2 = Infant botulism
3 = Wound botulism
4 = Other botulism

Case Investigation Process

Foodborne botulism

Even one case of foodborne botulism constitutes a public health emergency. Public health has five main roles when a case of foodborne botulism is identified or suspected:

Source Investigation

Public health should aggressively investigate for the source of intoxication and immediately remove it from general public consumption once identified. The investigation should not wait for positive test results. The general recommendations for identifying suspect foods follow:

- Identify all home-canned foods eaten during the week prior to symptoms.
- The most suspect foods are those eaten less than two days before onset and those that were not eaten by other well persons. Keep in mind that additional cases may experience less severe symptoms with a later onset than the first case identified.
- Identify all commercially canned foods eaten during the week prior to the onset of illness. For implicated foods, determine the brand, manufacturer, package size, lot number, and place and date of purchase.
- Identify all sausage and other preserved meats eaten during the week prior to onset of illness.
- Meat products that have not been adequately refrigerated are also suspect.
- Identify all smoked or otherwise preserved fish eaten during the week before onset of symptoms.

Contact investigation

All case contacts that may have eaten contaminated food should be identified and appropriately managed (explained in detail below).

Laboratory testing

UPHL is the only laboratory in Utah that provides testing of human and non-human samples for botulinum toxin and *C. botulinum*. UPHL also provides this service to other states in the region (Wyoming, Colorado, Arizona, and Montana). Because of the resources required, UPHL depends on clearance from the BOE before the test is performed. The BOE coordinates with the patient's physician and the local health department to determine cases for which testing will be provided.

Treatment
The CDC has the responsibility to consult with the patient's physician and the BOE to ensure that equine-derived botulism antitoxin is released when appropriate. The BOE ensures that this consultation has been initiated when appropriate. Botulism antitoxin is released by the CDC only after consultation with the patient's physician and the BOE. The Enteric Disease Epidemiology Branch at CDC can be reached through the CDC's Emergency Operations Center at 770-488-7100.

Education
The public health investigator should educate the patients and their family on the prevention of botulism intoxication.

Wound botulism
Public health has three main roles when a case of wound botulism is identified or suspected.

Laboratory testing
UPHL is the only laboratory in Utah that provides testing of human and non-human samples for botulinum toxin and *C. botulinum*. UPHL also provides this service to other states in the region (Wyoming, Colorado, Arizona, and Montana). Because of the resources required, UPHL depends on clearance from the BOE before the test is performed. The BOE coordinates with the patient's physician and the local health department to determine cases for which testing will be provided.

Treatment
The CDC has the responsibility to consult with the patient's physician and the BOE to ensure that equine-derived botulism antitoxin is released when appropriate. The BOE ensures that this consultation has been initiated when appropriate. Botulism antitoxin is released by the CDC only after consultation with the patient's physician and the BOE. The Enteric Disease Epidemiology Branch at CDC can be reached through the CDC's Emergency Operations Center at 770-488-7100.

Education
The public health investigator should educate the patients and their family on the prevention of botulism intoxication.

Outbreaks
Botulism usually occurs as sporadic cases; however, outbreaks of foodborne botulism can occur if multiple persons consume contaminated food.

Identification and Management of Case Contacts
Foodborne botulism
Persons who consumed food items suspected to be the source of foodborne botulism should be immediately contacted, advised to seek health care, and questioned about symptoms. Depending on the time of ingestion, other exposed persons might be candidates for treatment with purgatives, and at the very least, should be under close medical supervision.

Wound botulism

When additional cases are suspected to be related to a case of wound botulism (e.g. injection drug user), contacts may be identified and investigated.

✓ REFERENCES

Centers for Disease Control and Prevention. National Notifiable Diseases Surveillance System, 2018 Annual Tables of Infectious Disease Data. Atlanta, GA. CDC Division of Health Informatics and Surveillance, 2019. Available at: https://www.cdc.gov/nndss/infectious-tables.html.

Control of Communicable Diseases Manual (20th Edition), David L. Heymann MD, Ed., 2015.

Council for State and Territorial Epidemiologists. CSTE Position Statements 2009: https://cdn.ymaws.com/www.cste.org/resource/resmgr/PS/09-ID-29.pdf.

Council for State and Territorial Epidemiologists. CSTE Position Statements 2010: https://cdn.ymaws.com/www.cste.org/resource/resmgr/PS/10-ID-03.pdf.

Massachusetts Department of Public Health, Guide to Surveillance, Reporting, and Control, 2006.

National Enteric Disease Surveillance: Botulism Annual Summary, 2011 https://www.cdc.gov/nationalsurveillance/pdfs/botulism_cste_2011.pdf.

Principles and Practice of Infectious Disease (6th Edition), Gerald L. Mandell, John E. Bennett, and Raphael Dolin Eds; 2005.

Red Book: 2015 Report of the Committee on Infectious Diseases (30th Edition), American Academy of Pediatrics, Ed 2015.

✓ VERSION CONTROL

V.12.21: Added Critical Clinician Information, Importance to Public Health, UT-NEDSS Minimum/Required Fields by Tab, and Electronic Laboratory Reporting Processing Rules sections. Updated Disease and Epidemiology, Public Health Control Measures, and Case Investigation. General updates to document formatting.

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✓ UT-NEDSS Minimum/Required Fields by Tab

Demographic
- First Name
- Last Name
- Street Number
- Street Name
- City
- State
- County
- Zip Code
- Date of Birth
- Area Code
- Phone Number
- Birth Gender
- Ethnicity
- Race

Clinical
- Disease
- Onset Date
- Visit Type
  - (if inpatient) Did Botulism cause hospitalization?
- Died
  - (if yes) Date of Death
  - (if yes) Did Botulism cause death?
- Was antitoxin administered?
  - (if yes) Date administered

Laboratory
- Lab Name
- Lab Test Date
- Collection Date
- Specimen Source
- Test Type
- Organism
- Test Result
- Accession Number
- Was specimen or isolate forwarded to CDC for testing or confirmation?
  - (if yes) Date specimen sent to CDC

Epidemiological
- Food Handler
  - Name of facility where patient handled food
  - Location
  - Did the patient work while ill?
  - Important information including dates
- Healthcare Worker
  - Name of healthcare facility
  - Location
  - Did the patient work while ill?
  - Important information including dates
- Group Living
  - Name of the facility
  - Location
  - Did the patient work/attend while ill?
  - Important information including dates
- Childcare Association
  - Name of the daycare
  - Location
  - Did the patient work/attend while ill?
  - Important information including dates
- Occupation
- Imported From
- Risk Factors
- Risk Factor Notes

Investigation
- Supplemental Symptoms Tab
  - Temperature
  - Blood Pressure
  - Heart Rate
  - Respiration Rate
  - Nausea
  - Vomiting
  - Abdominal Pain
  - Diarrhea
  - Constipation
  - Blurred Vision
  - Diplopia (double vision)
  - Dizziness
  - Slurred speech
  - Thick tongue
  - Change in sound of voice
  - Hoarseness
  - Dry Mouth
  - Dysphagia (difficulty swallowing)
  - Shortness of Breath
  - Subjective Weakness
  - Fatigue
  - Paresthesia (abnormal sensation, e.g. numbness)
  - Other symptoms not listed above? (if yes, specify)
- Physical Exam Tab

Investigation Continued

- Alert and Oriented
- Extraocular Palsy (paralysis of eye muscles) (if yes, bilateral?)
- Ptosis (drooping eyelids) (if yes, bilateral?)
- Pupils dilated (if yes, bilateral? mm?)
- Pupils constricted (if yes, bilateral? mm?)
- Pupils nonreactive (if yes, bilateral?)
- Facial paralysis (if yes, bilateral?)
- Palatal weakness (if yes, bilateral?)
- Impaired gag reflex
- Sensory deficit (if yes, specify)
- Other physical exam findings

- Musculoskeletal Exam Tab
  - If muscle weakness/paralysis present, describe progression (if other, specify)
- Past Medical History Tab
  - Prior botulism diagnosis
  - Date of prior botulism diagnosis
  - Medications that could cause neuromuscular paralysis used within 30 days before illness onset
  - Other medication used, not listed above
  - Prior neurological impairment (if yes, specify)
  - Does patient have an allergy to equine products (if yes, describe)
  - Most likely diagnosis
  - Second most likely diagnosis
  - Third most likely diagnosis

Contacts

- Does case's infection appear secondary to another person's infection? (if YES, please fill out info in contact table)
- Any contacts ill with similar symptoms? (if YES, please fill out info in contact table)

Reporting

- Date first reported to public health

Administrative

- State Case Status
- Outbreak Associated
- Outbreak Name

✓ ELECTRONIC LABORATORY REPORTING PROCESSING RULES

Botulism Rules for Entering Laboratory Test Results

The following rules describe how laboratory results reported to public health should be added to new or existing events in UT-NEDSS. These rules have been developed for the automated processing of electronic laboratory reports, although they apply to manual data entry, as well.

Test-Specific Rules

Test specific rules describe what test type and test result combinations are allowed to create new morbidity events in UT-NEDSS, and what test type and test result combinations are allowed to update existing events (morbidity or contact) in UT-NEDSS.

Test Type	Test Result	Create a New Event	Update an Existing Event
PCR/Amplification	Positive	Yes	Yes
	Negative	No	Yes
	Equivocal	No	Yes
	Other	No	Yes
Culture	Positive	Yes	Yes
	Negative	No	Yes
	Equivocal	No	Yes
	Other	No	Yes

Whitelist Rules

Whitelist rules describe how long an existing event can have new laboratory data appended to it. If a laboratory result falls outside the whitelist rules for an existing event, it should not be added to that event, and should be evaluated to determine if a new event (CMR) should be created.

Botulism Morbidity Whitelist Rule: If the specimen collection date of the laboratory result is 2 years or less after the last positive specimen collection date of the morbidity event, the laboratory result should be added to the morbidity event.

Botulism Contact Whitelist Rule: Never added to contact.

Graylist Rule

We often receive laboratory results through ELR that cannot create cases, but can be useful if a case is created in the future. These laboratory results go to the graylist. The graylist rule describes how long an existing event can have an old laboratory result appended to it.

Botulism Graylist Rule: If the specimen collection date of the laboratory result is 30 days before to7 days after the event date of the morbidity event, the laboratory result should be added to the morbidity event.

Other Electronic Laboratory Processing Rules

- If an existing event has a state case status of “not a case,” ELR will never add additional test results to that case. New labs will be evaluated to determine if a new CMR should be created.