Botulism

Clostridium Botulinum
Including Foodborne, Infant, Intestinal, and Wound

IMMEDIATELY REPORTABLE DISEASE

Per N.J.A.C. 8:57, health care providers and administrators shall immediately report **by telephone** confirmed and suspected cases of botulism to the health officer of the jurisdiction where the ill or infected person lives, or if unknown, wherein the diagnosis is made. The health officer (or designee) **must immediately institute the control measures listed below in section 6, "Controlling Further Spread**," regardless of weekend, holiday, or evening schedules. A directory of local health departments in New Jersey is available at http://www.state.nj.us/health/lh/directory/lhdselectcounty.shtml.

If the health officer is unavailable, the health care provider or administrator shall make the report to the Department by telephone to 609.826.5964, between 8:00 A.M. and 5:00 P.M. on non-holiday weekdays or to 609.392.2020 during all other days and hours.

CDS Communicable Disease Service

NEW JERSEY DEPARTMENT of HEALTH and SENIOR SERVICES

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1 THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Botulism is caused by exposure to a neurotoxin produced by *Clostridium botulinum*, an anaerobic, spore-forming bacterium. The toxin is produced as the bacteria are multiplying under anaerobic (no oxygen) and low-acid (generally pH >4) conditions. There are seven types of botulinum toxin (A to G), but human botulism is caused primarily by types A, B, and E.

B. Clinical Description

C. botulinum toxin is one of the most potent lethal substances known. In humans, botulism manifests itself in one of four clinical forms: foodborne botulism, wound botulism, infant (intestinal) botulism, and, rarely, adult infectious (intestinal) botulism. The site of toxin production is different for each of the forms, but they all are associated with the clinical finding of flaccid paralysis that results from botulinum neurotoxin.

Foodborne botulism is a potentially life-threatening illness caused by the ingestion of preformed *C. botulinum* toxin. The clinical picture consists of neurologic signs and symptoms, including blurred or double vision, dysphagia, dry mouth, and peripheral muscle weakness. Symmetric descending flaccid paralysis is classic for botulism, beginning with the cranial nerves. Paralysis then affects the upper extremities, the respiratory muscles, and finally the lower extremities. Patients usually require ventilatory support, which is commonly needed for two to eight 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 ratio than B or E has been. In general, the case-fatality ratio for foodborne botulism is 5% to 10%. Recovery may take months.

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

Infant (intestinal) botulism has a distinctly different clinical presentation than do wound and foodborne botulism. In infant botulism, the *C. botulinum* spores are ingested and the toxin is formed in the intestines in the absence of mature gastrointestinal flora. This disease is usually confined exclusively to infants less than one year of age. The earliest clinical sign in infant botulism is constipation, which is followed by poor feeding, decreased sucking, lethargy, listlessness, ptosis (droopy eyes), difficulty swallowing, a weak cry, and lack of muscle tone; these symptoms led to the term "floppy baby" syndrome. In some cases, respiratory failure may occur. Infant botulism presents with a wide range of severity, from mild illness to sudden death. Some studies suggest that infant botulism may be responsible for up to 5% of cases of sudden infant death syndrome. Among hospitalized cases in the United States, the case-fatality ratio is less than 1%.

Adult infectious (intestinal) botulism occurs as a result of toxin production in the intestines in a manner similar to that of infant botulism. Most people with adult infectious botulism are found to have suffered from a disruption of their natural intestinal flora resulting from abdominal surgery, antibiotic treatment, or gastrointestinal-tract abnormalities.

C. Reservoirs

C. botulinum spores are ubiquitous in soils worldwide; they are frequently recovered from agricultural products, including honey. The spores can survive indefinitely in soil under almost any environmental condition. Spores are also found in marine sediments and in the intestinal tract of animals, including fish.

D. Modes of Transmission

Foodborne botulism is acquired by ingesting preformed toxin. This usually occurs as a result of ingesting food that has been inadequately processed and then inadequately prepared before being eaten. The most frequent source is home-canned foods, but outbreaks have also been attributed to baked potatoes in foil, minced garlic in oil, and sautéed onions cooked under a layer of butter. Tomato products, once thought to be a low-risk food because of a pH less than four, can no longer be dismissed as a potential vehicle. The toxin is destroyed by boiling.

Wound botulism occurs when wounds are contaminated with dirt or gravel containing botulism spores. Wound botulism has also been reported among chronic injection-drug users.

Infant (intestinal) botulism, which is the most common form of botulism in the United States, occurs as a result of ingestion of the spore form of the bacteria, which then goes on to germinate and produce toxin in the intestines. This **disease process** can happen through ingestion of food, soil, or dust contaminated with botulinum spores. Honey often contains *C. botulinum* spores. Some cases of infant botulism have occurred in children living in areas of construction and earth disruption.

Adult infectious (intestinal) botulism occurs in a manner similar to that of infant botulism.

E. Incubation Period

The incubation period is variable, but neurologic symptoms of foodborne botulism usually appear within 12 to 36 hours (range: six hours to eight days) after eating contaminated food. In general, the shorter the incubation period, the more severe the disease and the higher the case-fatality ratio. The median incubation period for wound botulism is generally longer than for foodborne botulism—usually seven days, with a range of four to 14 days. In general, the shorter the incubation period, the more severe the disease. The incubation period for infant botulism is unknown because it is usually not known when the spores were ingested.

F. Period of Communicability or Infectious Period

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

G. Epidemiology

Botulism occurs worldwide, as sporadic cases and as outbreaks, including familial clusters. In the United States, since 1973 an average of 24 cases of foodborne botulism, three cases of wound botulism, and 71 cases of infant botulism have been reported annually to the Centers for Disease Control and Prevention (CDC). Since 1994, the use of black tar heroin by chronic injection-drug users has led to a dramatic increase in the number of cases of wound botulism. In New Jersey in 2005, there were two confirmed cases of foodborne botulism and seven cases of infant botulism; all nine recovered.

H. Bioterrorist Potential

C. botulinum toxin is considered a potential bioterrorist agent. If acquired and properly disseminated, botulinum toxin could cause a serious public health challenge in terms of the ability to limit the numbers of casualties and control other repercussions from such an attack. Although the greatest threat may be via aerosol, the more common threat may be via food and drink. The occurrence of even a single case of botulism, especially if there is no obvious source of an improperly preserved food, should raise the possibility of deliberate use of botulinum toxin. All such cases should be reported immediately so that appropriate investigations can be initiated without delay.

2 CASE DEFINITION

A. New Jersey Department of Health and Senior Services (NJDHSS) Case Definition

1. Infant (Intestinal) Botulism

Clinical Description

Infant botulism is rare. It affects children younger than one year and, in rare circumstances, adults with altered gastrointestinal anatomy and microflora. Ingested spores germinate and produce bacteria that reproduce in the gut and release toxin. In most adults and children older than six months, germination does not happen because natural defenses prevent germination and growth of *C. botulinum*. Clinical symptoms in infants include constipation, loss of appetite (poor feeding), an altered cry, muscle weakness, and a striking loss of head control ("floppy baby" syndrome). Infant botulism has in some cases been associated with ingestion of honey contaminated with botulism spores, and mothers are warned not to feed raw honey to their infants.

Laboratory Criteria for Diagnosis

Detection of botulinum toxin in stool or serum OR

Isolation of *C. botulinum* from stool.

Case Classification

CONFIRMED
A clinically compatible case AND

Detection of botulinum toxin in stool or serum OR

Isolation of *C. botulinum* from stool.

PROBABLE
Not used.

POSSIBLE
Not used.

2. Foodborne Botulism

Clinical Description

Foodborne botulism is caused by neurotoxins present in contaminated food and is characterized by acute bilateral cranial nerve impairment and descending weakness or

paralysis. Visual difficulty (blurred or double vision), dysphagia, and dry mouth are often first complaints.

Laboratory Criteria for Diagnosis

Detection of botulinum toxin in serum, stool, or patient's food OR

Isolation of *C. botulinum* from stool.

Clinical Testing

- Electromyography to rule out myasthenia gravis and Guillain-Barré syndrome (which can present with similar symptoms)
- Tensilon test to rule out myasthenia gravis
- Neuroradiologic studies such as CT scan or MRI to rule out stroke

Case Classification

CONFIRMED
A clinically compatible case that is laboratory confirmed by

Detection of botulinum toxin in serum, stool, or patient's food OR

Isolation of *C. botulinum* from stool OR

A clinically compatible case that occurs among persons who ate the same food as did persons who have laboratory-confirmed botulism.

PROBABLE
A clinically compatible case with an epidemiologic link to a suspect food (e.g., ingestion of a home-canned food within the previous 48 hours)

POSSIBLE
Not used.

3. Wound Botulism

Clinical Description

An illness resulting from toxin produced by *C. 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 *C. botulinum* from wound.

Case Classification

CONFIRMED
A clinically compatible case, with no exposure to contaminated food, with history of a fresh, contaminated wound during the two weeks before onset of symptoms AND

Detection of botulinum toxin in serum OR

Isolation of *C. botulinum* from a wound.

POSSIBLE
Not used.

PROBABLE
Not used.

4. Other Botulism

CONFIRMED
A clinically compatible case patient, older than one year, who has **NO** history of ingestion of suspected food and has no wounds, AND

Detection of botulinum toxin in clinical specimen OR

Isolation of *C. botulinum* in clinical specimen.

POSSIBLE
Not used.

PROBABLE
Not used.

NOTE: See section 4 below for information on how to report a case.

B. Differences from CDC Case Definition

The CDC surveillance case definition for botulism is the same as the criteria outlined in section 2 of this chapter. CDC case definitions are used by state health departments to maintain uniform standards for national reporting.

3 LABORATORY TESTING AVAILABLE

The New Jersey Public Health and Environmental Laboratories (PHEL) will test clinical specimens for the presence of both *C. botulinum* and botulinum toxin if epidemiologically

and clinically indicated. The most reliable method for testing for toxin is the mouse neutralization test. Because of the nature of the laboratory testing for *C. botulinum* toxin and bacteria, testing will be done only if epidemiologically and clinically indicated, and approved by the Communicable Disease Service (CDS). For more information call the Infectious and Zoonotic Diseases Program (IZDP) at 609.588.7500. Suitable specimens for testing include stool, vomitus, serum, and gastric contents. All specimens except those from wounds should be refrigerated, not frozen. Wound specimens should be placed in anaerobic transport devices and sent to PHEL without refrigeration. Serum and stool samples should be obtained prior to treatment with either botulism immune globulin (BIG) or antitoxin.

Adult: Stool specimen should be at least 25 grams and kept refrigerated. Serum should be collected in a red-top tube.

Infant botulism: A sample size of at least 10 grams of stool is needed, which can be collected over a period of time in one container. If an enema must be given to obtain stool, a minimal amount of fluid (preferably bacteriostatic sterile water) should be used so as not to dilute the toxin unnecessarily.

The Microbiology Laboratory at PHEL will test food specimens for the presence of *C. botulinum* and/or toxin if epidemiologically indicated and with prior CDS approval. Food should be left in the original container if possible.

4 PURPOSE OF SURVEILLANCE AND REPORTING AND REPORTING REQUIREMENTS

A. Purpose of Surveillance and Reporting

- To assist in the diagnosis and treatment of potential cases
- To identify sources of public health concern (e.g., a commercially distributed food product) and to stop transmission from such a source
- To properly classify reported cases as foodborne, infant, or wound botulism
- To identify cases and clusters of human illness that may be associated with a bioterrorist event

B. Laboratory Reporting Requirements

Because of the rarity, potential severity, and possibility of bioterrorism involvement, the NJDHSS requests that laboratories **immediately report** any confirmed or suspect case of botulism to the local health officer having jurisdiction over the locality in which the patient lives or, if unknown, to the health officer in whose jurisdiction the requesting laboratory is located. If this is not possible, call NJDHSS CDS at 609.588.7500 during business hours, or 609.392.2020 after business hours or on weekends and holidays. Such telephone report shall be followed up by a written or electronic report within 24 hours of the initial report.

As botulism testing is available only at PHEL or CDC, NJDHSS IZDP must be informed to approve appropriate testing.

C. Health Care Provider Reporting Requirements

Health care providers are also requested to **immediately** report any confirmed or suspect case of botulism to the local health officer having jurisdiction over the locality in which the patient lives or, if unknown, to the health officer in whose jurisdiction the health care provider is located.

D. Health Officer Reporting and Follow-Up Responsibilities

The New Jersey Administrative Code (NJAC 8:57-1.8) stipulates that each local health officer must report the occurrence of any case of botulism, as defined by the reporting criteria in section 4 above. Current requirements are that cases be reported to NJDHSS IZDP immediately via telephone with subsequent follow-up written report using the CDS-1 form. A report may also be filed electronically over the Internet using the confidential and secure Communicable Disease Reporting and Surveillance System (CDRSS).

5 CASE INVESTIGATION

The most important step a local health officer can take if he or she learns of a suspected case of botulism, or any suspected exposure that may represent an act of bioterrorism, is to immediately call NJDHSS CDS at 609.588.7500 during business hours or 609.392.2020 after working hours.

NJDHSS IZDP will direct the case investigation of botulism in New Jersey residents. If a bioterrorist event is suspected, NJDHSS, in conjunction with CDC and other response authorities, will work closely with local health officers and provide instructions/information on how to proceed.

Following immediate notification of NJDHSS, the local health officers may be asked to assist in investigating any case(s) of botulism. The official case report using the CDS-1 form should follow notification.

A. Entry into CDRSS:

The mandatory fields for all cases in CDRSS include: disease, last name, county, municipality, gender, race, ethnicity, case status, report status.

The following table can be used as a quick reference guide to determine which fields in CDRSS are necessary for accurate and complete reporting of botulism cases. The first column represents the tabs along the top of the CDRSS screen. The Required Fields column reflects a detailed explanation of the essential data for each tab.

CDRSS Screen	Required Information
Patient Info	Enter disease name "BOTULISM," patient demographics, patient onset and date report was made to the local health department. There are four subgroups for BOTULISM, ("PENDING," "FOODBORNE," "INFANT" AND "WOUND"). Determine type of botulism and select the appropriate subgroup: Foodborne botulism is a true medical and public health emergency and should be investigated as such. Infant and wound botulism do not require the same urgency in investigation. Therefore, it is essential to determine what illness is occurring. **NOTE: All types of botulism must be reported to NJDHSS immediately via telephone.**
Addresses	Use as needed for additional addresses (e.g., work address, school, temporary NJ address for out-of-state case). Use the Comments section in this screen to record any pertinent information about the alternate address. Entering an alternate address will allow other disease investigators access to the case if the alternate address falls within their jurisdiction.
Clinical Status	Clinical information such as past medical history, any treatment that the patient received, name of medical facility(s) including date of initial healthcare evaluation and dates of hospitalization, treating physician(s), and mortality status are entered here. (**NOTE:** If the patient received care from two or more medical facilities, be sure all are recorded in the case including admit/discharge dates so the case can be accessed by all infection control professionals (ICPs) covering these facilities,)
Signs/Symptoms	Make every effort to get complete information by interviewing the physician, family members, ICP, or others who might have knowledge of the patient's illness. Check appropriate boxes for signs and symptoms and indicate their onset and resolution.
Risk Factors	See section 5E below for subgroup specific risk factors,
Laboratory Eval	Enter Lab Specimen ID, Specimen, Date specimen collected, Lab Name, Referring Physician Name, Referring Medical Facility name, Test Result i.e., Positive/reactive or Negative/not reactive.

CDRSS Screen	Required Information
Contact Tracing	All potentially exposed contacts are entered into the contact tracing tab for local, county and statewide surveillance efforts. CDRSS requires a "YES" response to one of the two exposure questions in order to add case contacts. Contacts are added individually by selecting the Enter Contact By Name feature: Each contact record reflects the period of exposure, symptomatic or asymptomatic, contact demographics, telephone numbers, marital status, primary language, exposure risk i.e., close, casual, unknown, and LHD response activities are noted. An exposure setting is selected for each contact from the drop down to the right of the contact's name. A summary reflecting the following contact details: total number, name, age, relationship, exposure specifics as well as all LHD recommendations to prevent further transmission of illness are entered into the contact tracing text box.
Case Comments	Any additional case investigation findings that can not be entered in discrete data fields are documented in the general comment section.
Epidemiology	See Section 5E below for subgroup specific information. The NJDHSS assigned outbreak or investigation number is selected for all involved cases which automatically populates a summary of the initial report.
Case Classification Report Status	Case status options are: "REPORT UNDER INVESTIGATION (RUI)," "CONFIRMED," "PROBABLE," "POSSIBLE," and "NOT A CASE." • All cases entered by laboratories (including LabCorp electronic submissions) should be assigned a case status of "REPORT UNDER INVESTIGATION (RUI)." • Cases still under investigation by the LHD should be assigned a case status of "REPORT UNDER INVESTIGATION (RUI)." • Upon completion of the investigation, the LHD should assign a case status on the basis of the case definition. "CONFIRMED", "PROBABLE", and "NOT A CASE" are the only appropriate options for classifying a case of botulism. Report status options are: "Pending," "LHD open," "LHD review," "LHD closed," "Delete," "Reopened," "DHSS open," "DHSS

CDRSS Screen	Required Information
	review," and "DHSS approved." • Cases reported by laboratories (including LabCorp electronic submissions) should be assigned a report status of "PENDING." • Once the LHD begins investigating a case, the report status should be changed to "LHD OPEN." • The "LHD REVIEW" option can be used if the LHD has a person who reviews the case before it is closed (e.g., health officer or director of nursing). • Once the LHD investigation is complete and all the data are entered into CDRSS, the LHD should change the report status to "LHD CLOSED." "LHD CLOSED" cases will be reviewed by DHSS and be assigned one of the DHSS-specific report status categories. If additional information is needed on a particular case, the report status will be changed to "REOPENED" and the LHD will be notified by e-mail. Cases that are "DHSS APPROVED" cannot be edited by LHD staff.

B. Use the following general guidelines to investigate:

1. Foodborne Botulism

The source of the intoxication and other potentially exposed persons must be identified. The case must be interviewed concerning possible food sources. In most cases, this information will need to be obtained from family members or other close contacts, because the patient will most likely not be in a condition to be interviewed. The NJDHSS Food and Drug Safety Program (FDSP) in Consumer and Environmental Health Services may be contacted for assistance in determining possible food sources at 609.588.3123, or 609.392.2020 after working hours. The following guidelines assist the local health department staff in the investigation of a suspected case of botulism.

- 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, those that are low in acid, and those that were not eaten by other persons who remain well. Keep in mind that some cases may experience symptoms later than does the case patient or that are less severe than those of the case patient.
- 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 should also be suspected.

- Identify all smoked, uneviscerated, or otherwise preserved fish eaten during the week before onset of symptoms.
- Identify food items that may have been prepared in oil such as garlic-in-oil products and sautéed onions.
- Identify products that may have been packaged using Modified Atmosphere Packaging.
- Identify other potentially exposed persons. Other persons who have eaten implicated food must be reached as soon as possible and advised to seek health care immediately. Other exposed persons should be under close medical supervision.
    - Obtain the name, address, and telephone number of every person 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.
- Remove implicated food items from the environment for testing. A decision about culturing implicated food items must be made in consultation with an epidemiologist in the CDS. Coordination for pickup and testing of food samples is the responsibility of the local health departments. If a commercial product is suspected, report this to NJDHSS FDSP at 609.588.3123 to coordinate follow-up with relevant outside agencies.

2. Wound Botulism

No follow-up required.

3. Intestinal Botulism (Infant Botulism)

Ask caretakers about infant's diet, honey consumption, and construction sites in the vicinity of the child's residence; otherwise, extensive epidemiological follow-up is not usually required. Education should be provided regarding prevention.

4. Adult Infectious Botulism

As with infant botulism, extensive epidemiological follow-up is not usually required. Education should be provided regarding prevention.

5. Botulism Testing

In all cases of suspected botulism a determination is made by CDS and the case's health care provider about the appropriateness of botulism testing, based on available clinical and epidemiological data. Arrangements will then be made for the submission of appropriate specimens.

6. Botulism Antitoxin

Antitoxin therapy is administered only to adult patients with foodborne or wound botulism. Antitoxin is not indicated in cases of infant botulism. Antitoxin is a horse serum product and may cause serum sickness in approximately 20% of treated persons. The health care provider in consultation with CDS must determine the need for antitoxin therapy.

CDC must release and approve the use of antitoxin. The local health officer should be prepared to assist with logistic arrangements. The decision to administer antitoxin must be made immediately. The longer the wait, the less effective antitoxin will be. Because testing for the presence of toxin or bacteria in clinical specimens can take many days, the decision to administer antitoxin cannot wait for testing to confirm the diagnosis.

7. Botulism Immune Globulin

Treatment with BIG is a relatively new option for the treatment of infant botulism and should be started as early in an infant's illness as possible for best results. It has been proven to reduce hospital stays and costs. BIG must be ordered from the California Department of Health Services under a US Food and Drug Administration (FDA)-approved Treatment Investigational New Drug protocol. Stool for testing should be obtained, if possible, prior to administration of BIG. The CDS epidemiologist will assist the health care provider in determination of the need for BIG and in ordering, if needed.

C. Other Reporting/Investigation Issues

- Case report forms (CDS-1 and labs) DO NOT need to be mailed to NJDHSS as long as mandatory fields in CDRSS indicated in section B are completed.
- Once LHD completes its investigation and assigns a report status of "LHD closed," NJDHSS will review the case. NJDHSS will approve the case by changing the report status to "DHSS approved." At this time, the case will be submitted to CDC and the case will be locked for editing. If additional information is received after a case has been placed in "DHSS approved," you will need to contact NJDHSS to reopen the case. This should be done only if the additional information changes the case status of the report.
- If there have been several attempts to obtain patient information (e.g., the patient or health care provider does not return calls or respond to a letter, or the patient refuses to divulge information or is too ill to be interviewed), please fill out the form with as much information as possible. Please note on the form why it could not be filled out completely. Every effort should be made to complete the investigation within three months of opening a case. Cases that remain open for three months or more and have no investigation or update notes will be closed by NJDHSS.

6 CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements (NJAC 8:57-1.10)

1. Minimum Period of Isolation of Patient

Not applicable.

2. Minimum Period of Quarantine of Contacts

Not applicable.

B. Protection of Contacts of a Case

Not applicable.

C. Managing Special Situations

1. Reported Incidence is Higher than Usual/Outbreak Suspected

Any case of botulism is considered a public health emergency and a possible outbreak must be investigated to determine the source of illness and mode of transmission. See section 5 above for the proper response to a case of suspect or confirmed botulism.

NOTE: If an act of bioterrorism is suspected, NJDHSS and other response authorities will work closely with local boards of health and provide instructions/information on how to proceed.

2. Foodborne Botulism

NJDHSS FDSP will initiate food sampling, embargoes, recalls, and voluntary destructions as required and will coordinate the trace-back of commercial sources of implicated food products with the FDA, US Department of Agriculture, and other states if necessary. Please call NJDHSS FDSP at 609.588.3123.

7 OUTBREAK SITUATIONS

If the number of reported cases in an institutional setting or jurisdiction is higher than usual for the time of year, an outbreak might be occurring. In accordance with NJAC 8:57, IZDP should be contacted immediately at 609.588.7500. This situation may warrant an investigation of clustered cases to determine a course of action to prevent further cases. In contrast to what routinely occurs at the local level, program staff can perform surveillance for clusters of illness that may cross several jurisdictions and thereby be better able to assess the extent of an outbreak during its infancy.

8 PREVENTIVE MEASURES

A. Personal Measures/Education

To prevent botulism:

- Refer individuals who are interested in home-canning and other preservation techniques to call NJDHSS, Division of Consumer Health and Environmental Services, FDSP at 609.588.3123 or visit the FDA Web site or the University of Georgia National Center for Home Food Preservation Web page (http://www.uga.edu/nchfp/index.html).
- Instruct individuals to not open bulging containers, and not eat or even "taste-test" foods with off odors.
- Instruct individuals to not feed honey to children younger than one year old.

B. Immunization

No immunization is available for protection against botulism.

Additional Information

A Foodborne Botulism Fact Sheet and Infant Botulism Fact Sheet can be obtained at the NJDHSS Web site at http://nj.gov/health/cd. Under the heading of "What You Should Know About," scroll down to "Botulism." For information on botulism from the CDC, visit http://www.bt.cdc.gov/Agent/Botulism/CaseDef.asp.

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