

## Virginia Department of Health Botulism: Overview for Healthcare Providers

<b>Organism</b>	<ul style="list-style-type: none"> <li>• <i>Clostridium botulinum</i>, a gram positive, anaerobic, spore-forming bacterium can produce botulinum neurotoxin (BoNT). The toxin's effects lead to botulism. Strains of <i>C. baratii</i>, <i>C. butyricum</i>, and <i>C. argentinense</i> can also produce BoNT.</li> <li>• 7 types of toxins (types A through G) and several mosaic toxins (C/D, D/C, and A/F) have been recognized. Human disease is caused primarily by toxin types A, B, E, and, rarely, F.</li> </ul>
<b>Reporting to Public Health</b>	Suspected or confirmed cases require <b>immediate</b> notification to the local health department (LHD). See <a href="https://www.vdh.virginia.gov/health-department-locator/">https://www.vdh.virginia.gov/health-department-locator/</a>
<b>Infectious Dose</b>	A few nanograms of toxin
<b>Occurrence</b>	<ul style="list-style-type: none"> <li>• Botulism occurs worldwide, but the incidence is low</li> <li>• In the United States, ~100–200 cases are reported annually; in Virginia, ~3 cases are reported annually. Most reported cases are infant botulism.</li> </ul>
<b>Natural Reservoir</b>	<i>C. botulinum</i> spores are ubiquitous in the environment. Spores can be found in soil, dust, marine sediments, and the intestinal tracts of animals, including fish.
<b>Route of Infection</b>	<ul style="list-style-type: none"> <li>• Multiple types of botulism based on the route: foodborne, infant, wound, adult intestinal toxemia (also known as adult intestinal colonization), iatrogenic, and inhalational</li> <li>• Unintentional exposure can occur by ingesting pre-formed toxin (foodborne), ingesting spores (infant; adult intestinal toxemia), having a wound contaminated with spores (wound), receiving excess injectable toxin during cosmetic or medical procedure (iatrogenic), inhaling toxin released in aerosols (inhalational)</li> <li>• If BoNT was used during a bioterrorism event, it might be released in toxin-contaminated food or water or via aerosols</li> </ul>
<b>Communicability</b>	Botulism is not transmissible from person to person, except in cases of infant botulism where it may be passed from stool to open wounds or cuts
<b>Risk Factors</b>	<ul style="list-style-type: none"> <li>• All persons are susceptible</li> <li>• Foodborne: consuming homemade foods that are improperly canned, preserved, or fermented or consuming certain kinds of homemade alcohol (e.g., prison wine known as “pruno” or “hooch”)</li> <li>• Infant (&lt;12 months of age): consuming honey or products made with honey</li> <li>• Wound: injecting certain drugs (e.g., black tar heroin) or having contamination of a wound or open fracture with soil or gravel</li> <li>• Adult intestinal toxemia: risk is higher among those with a weakened immune system, altered GI anatomy or altered gut bacterial flora because of antimicrobial use</li> <li>• Iatrogenic: receiving excess injectable botulinum toxin for cosmetic or medical procedures</li> <li>• Inhalational: exposure to toxins in aerosols (e.g., laboratory exposure)</li> </ul>
<b>Case-fatality Rate</b>	Case-fatality rate among those with appropriate treatment is approximately 5%
<b>Incubation Period</b>	<ul style="list-style-type: none"> <li>• Foodborne: 12–72 hours (range 2 hours–8 days)</li> <li>• Infant and adult intestinal toxemia: unknown</li> <li>• Wound: approximately 7 days (range 4–14 days)</li> <li>• Iatrogenic: days to weeks</li> <li>• Inhalational: approximately 1–3 days</li> </ul>
<b>Clinical Description</b>	<ul style="list-style-type: none"> <li>• Classic presentation: Symmetrical cranial nerve paresis is initial finding resulting in visual disturbance, dysarthria, and dysphagia. Patients are afebrile and mentally alert.</li> <li>• Subsequent neurological findings: A symmetric, descending, flaccid paralysis, extending to trunk and limbs. This may lead to respiratory failure and require mechanical ventilation.</li> </ul>

	<ul style="list-style-type: none"> <li>• Patients may have GI symptoms (abdominal pain, distended abdomen, or constipation)</li> <li>• Infants with botulism appear lethargic, feed poorly, are constipated, and have a weak cry and poor muscle tone; infants might resemble “failure to thrive” or “floppy baby”</li> </ul>
<b>Differential Diagnosis</b>	<ul style="list-style-type: none"> <li>• For adults: Guillain-Barré syndrome, myasthenia gravis, cerebrovascular accident, bacterial or chemical food poisoning, tick paralysis, chemical intoxication (e.g., carbon monoxide), mushroom poisoning, poliomyelitis, and psychiatric illness</li> <li>• For infants: sepsis, meningitis, acute flaccid myelitis, electrolyte imbalance, Reye’s syndrome, congenital myopathy</li> <li>• NOTE: It has been reported that botulism may be misdiagnosed as Guillain-Barre syndrome, stroke, myasthenia gravis, etc. Consider botulism in any patient with generalized weakness, particularly in association with evidence of cranial nerve paresis.</li> </ul>
<b>Radiography</b>	Infant botulism might reveal dilated colonic loops by radiography
<b>Specimen Collection and Laboratory Testing</b>	<ul style="list-style-type: none"> <li>• Acceptable specimens to test for botulinum toxin include: stool (5–10 g) or sterile enema (10–20 mL), serum (2–4mL), gastric aspirate or vomitus (10–20 mL), tissue or exudate (1 g), suspected food samples (if available). Stool (or sterile enema) and serum are typically the specimens of choice. For infant cases, the Division of Consolidated Laboratory Services (DCLS) will accept 1–2mL of serum to perform limited testing if appropriate volume cannot be collected.</li> <li>• <b>If botulism is suspected, notify the LHD immediately to discuss the case and laboratory testing. Specimens may be sent to DCLS after VDH has approved testing.</b></li> <li>• For questions about specimen collection, contact the DCLS Emergency Duty Officer available 24/7 at 804-335-4617</li> </ul>
<b>Treatment</b>	<ul style="list-style-type: none"> <li>• Botulinum antitoxin and supportive care, including respiratory and nutritional support</li> <li>• Treatment with botulinum antitoxin heptavalent (known as <a href="#">BAT</a>) should be based on the clinical presentation and findings. Treatment should NOT be delayed by waiting for confirmatory test results. Goal is to give antitoxin as early as possible (ideally less than 24 hours after symptoms begin). Antitoxin typically prevents paralysis from worsening.</li> <li>• BAT is available only from the Strategic National Stockpile (SNS) <b>after</b> consultation with LHD and CDC (available 24/7 at 770-488-7100)</li> <li>• Infant botulism is treated as soon as possible after clinical diagnosis with intravenous, human-derived botulism immune globulin (<a href="#">BabyBIG®</a>). BabyBIG® is available only from California Department of Public Health’s Infant Botulism Treatment and Prevention Program (available 24/7 at 510-231-7600) <b>after</b> consultation. In a bioterrorism attack, BabyBIG® is not recommended.</li> <li>• For more information, including dosing instructions, consult the <a href="#">BAT</a> and <a href="#">BabyBIG</a> package inserts or call the Virginia Department of Health Emergency Consultant Pharmacist at 804-786-4326</li> </ul>
<b>Postexposure Prophylaxis</b>	None. Antitoxins are not useful for preventive purposes.
<b>Vaccine</b>	Currently, there is no FDA-licensed vaccine against botulism
<b>Infection Control</b>	<ul style="list-style-type: none"> <li>• Use Standard Precautions; patients do not need to be isolated</li> <li>• Those known to have eaten tainted food should be kept under close medical observation. If the person begins to develop symptoms or signs of botulism, botulinum antitoxin should be given promptly, and the patient kept under close medical observation.</li> <li>• Infants with botulism can shed <i>C. botulinum</i> and toxin in the stool for weeks to months after onset. Hand hygiene among care givers is critical. Diapers should be disposed of so that other people or animals cannot come into contact with them. People with open cuts or wounds on their hands should wear gloves when handling soiled diapers. Avoid close contact with other infants (e.g., sharing crib and toys) while excretion might occur.</li> </ul>

**Package Inserts**

BAT: <https://www.fda.gov/vaccines-blood-biologics/approved-blood-products/bat-botulism-antitoxin-heptavalent-b-c-d-e-f-g-equine>

BabyBIG: <https://www.fda.gov/vaccines-blood-biologics/approved-blood-products/babybig>