

Clinical Guidelines for Diagnosis and Treatment of Botulism, 2021

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Summary

*Botulism is a rare, neurotoxin-mediated, life-threatening disease characterized by flaccid descending paralysis that begins with cranial nerve palsies and might progress to extremity weakness and respiratory failure. Botulinum neurotoxin, which inhibits acetylcholine release at the neuromuscular junction, is produced by the anaerobic, gram-positive bacterium *Clostridium botulinum* and, rarely, by related species (*C. baratii* and *C. butyricum*). Exposure to the neurotoxin occurs through ingestion of toxin (foodborne botulism), bacterial colonization of a wound (wound botulism) or the intestines (infant botulism and adult intestinal colonization botulism), and high-concentration cosmetic or therapeutic injections of toxin (iatrogenic botulism). In addition, concerns have been raised about the possibility of a bioterrorism event involving toxin exposure through intentional contamination of food or drink or through aerosolization. Neurologic symptoms are similar regardless of exposure route. Treatment involves supportive care, intubation and mechanical ventilation when necessary, and administration of botulinum antitoxin. Certain neurological diseases (e.g., myasthenia gravis and Guillain-Barré syndrome) have signs and symptoms that overlap with botulism. Before the publication of these guidelines, no comprehensive clinical care guidelines existed for treating botulism. These evidence-based guidelines provide health care providers with recommended best practices for diagnosing, monitoring, and treating single cases or outbreaks of foodborne, wound, and inhalational botulism and were developed after a multiyear process involving several systematic reviews and expert input.*

Introduction

Background

These evidence-based guidelines provide health care personnel with recommended best practices for diagnosing, monitoring, and treating botulism in the settings of conventional, contingency, and crisis standards of care. The following syndromes are described: foodborne botulism (exposure to botulinum neurotoxin in food), wound botulism (exposure to botulinum neurotoxin from a wound colonized with the bacteria), inhalational botulism (exposure to aerosolized botulinum neurotoxin, which could be caused intentionally), and iatrogenic botulism (exposure to botulinum neurotoxin by injection of high-concentration botulinum toxin for cosmetic or therapeutic purposes). These guidelines do not address syndromes of botulism caused by intestinal colonization by botulinum-toxin-producing *Clostridia* species (i.e., infant botulism and adult colonization botulism), which are inherently sporadic and have not occurred in outbreaks. Therefore, throughout the text, terms such as “botulism” and “patient with suspected botulism” refer to syndromes other than intestinal colonization.

Contamination of foods with botulinum neurotoxin can occur unintentionally when botulinum spores germinate under

appropriate conditions and produce toxin, or intentionally, when toxin is added directly to foods. Foodborne botulism outbreaks usually affect few persons. However, because large outbreaks are possible (“epidemic potential”), foodborne botulism is a public health emergency. Contamination of wounds with *Clostridium botulinum* and subsequent in situ botulinum toxin production is typically (in the United States) caused by unsanitary injection of a particular type of heroin (black tar heroin) subcutaneously or subdermally; although common-source heroin containing clostridial spores might affect groups of injectors, wound botulism does not have the epidemic potential of foodborne botulism (1). Purified botulinum toxin, produced and weaponized by military biological warfare programs of various countries, could be dispersed as an aerosol and cause inhalational botulism. This form of botulism, which does not occur naturally and has been reported once in a laboratory worker, could affect many persons (2).

Diagnosis of botulism depends on high clinical suspicion and a thorough neurologic examination. The timeliness of diagnosis is crucial to successful treatment because botulinum antitoxin, the only specific therapy for botulism, must be administered to patients as quickly as possible. In the United States, botulinum antitoxin (to treat suspected botulism, other than infant botulism) is available emergently and free of charge from the federal government. Health departments and CDC provide emergency clinical consultations 24 hours per day and facilitate rapid antitoxin delivery for treatment of suspected

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