

Botulism Overview & Update

Botulism is caused by *Clostridium botulinum*, a Gram-positive, anaerobic, spore-forming bacterium which produces botulinum toxin, the most potent neurotoxin known. *Clostridium* species are ubiquitous in the environment, found in soil, dust, and water sediments. Cases of foodborne, wound, and infant botulism have been identified in Orange County residents in 2017. Treatment of some patients has been delayed due to a delay in diagnosis. Providers should:

- **Consider the diagnosis of botulism and treat it emergently when patients present with a compatible clinical picture.**
- **Immediately report any suspect case of botulism to Orange County Public Health immediately at 714-834-8180. After hours, call 714-628-7008 and ask to speak to the Health Officer on Call.**

Botulism presents in four forms, all of which can be fatal and are medical emergencies:

Foodborne botulism: Results when food containing botulinum toxin is consumed. *C. botulinum* may contaminate improperly canned, preserved, stored or fermented foods.

Wound botulism: Occurs when a wound is contaminated with the bacteria, and is predominantly associated with subcutaneous or intramuscular black tar heroin use.

Infant botulism: Occurs after infants swallow spores of *C. botulinum* which grow and produce botulinum toxin in the large intestine.

Adult intestinal colonization is a very rare form of botulism that occurs when *C. botulinum* colonizes the digestive tract of an adult and produces toxin.

Two foodborne botulism cases were recently identified in Orange County residents.

Foodborne botulism classically occurs following consumption of home-canned foods, but outbreaks due to commercial or restaurant-prepared products do occur. The usual incubation period for foodborne botulism is 12 to 48 hours (range, 6 hours - 8 days).

Two foodborne botulism cases were recently reported following consumption of deer-antler tea (see picture at right). The tea was purchased in Los Angeles and has since been recalled. The tea comes in 6-inch by 4-inch plastic packages with labels in Korean, but without lot codes or "best by" dates. Customers are advised to dispose of the tea, and any foods made with it, immediately.

Botulism Signs and Symptoms

- **Descending muscle weakness with fatigability is the hallmark of botulism.** Illness usually begins with bilateral cranial nerve signs and symptoms including blurred vision, diplopia, ptosis, dysphagia, dysarthria, impaired gag reflex and facial weakness. It then proceeds to generalized weakness, hypotonia and dyspnea.
- Infant botulism symptoms include constipation, loss of facial expression, poor feeding, weak cry, diminished gag reflex, ocular palsies, loss of head control, and decreased movement.
- Respiratory difficulty is usually not present in adults at admission, but this depends on the promptness of presentation and diagnosis. Mechanical ventilation is frequently required at some point. One review of wound botulism found that 10 of 17 cases (59%) required mechanical ventilation.¹
- Recovery can take weeks or months and require considerable supportive care.
¹Yuan J, et al. Recurrent Wound Botulism Among Injection Drugs Users in California. *Clinical Infectious Diseases*. 2011; 52(7):862-66



A separate outbreak of 10 cases was recently reported in the Sacramento area and was caused by a mishandled nacho cheese product sold at a local gas station.

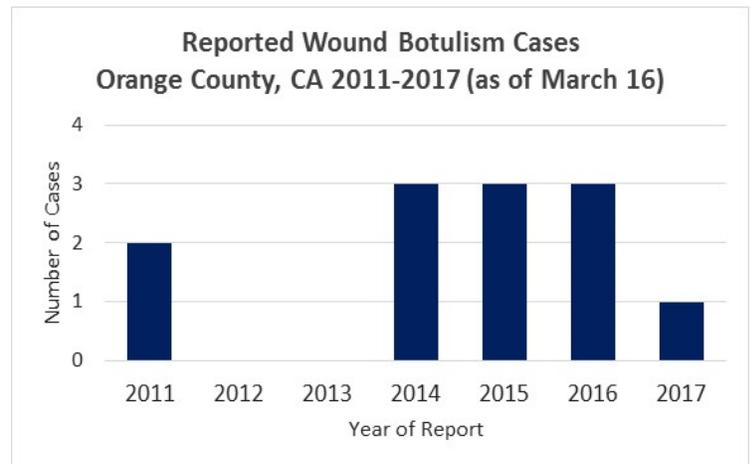
Reports of wound botulism have increased in recent years in Orange County.

Wound botulism occurs when *C. botulinum* spores infect devitalized tissue in a wound, frequently an abscess at an injection site, then germinate and produce toxin. Since 2014, Orange County has had 10 reports of wound botulism (see chart), all in patients with a history of black tar heroin use. The age of cases ranged from 21 to 60 years; 75% were male. Five were confirmed to have disease by laboratory testing, all with botulism type A. The other five were diagnosed with probable disease and treated with antitoxin immediately based on a compatible clinical presentation.

Heroin use has increased in Orange County over the last several years, as in much of the rest of the country: ED visits related to heroin abuse in Orange County more than doubled from 2010 to 2015, from 5.27 to

11.8 per 100,000 population.² Wound botulism cases in the County have increased in a similar fashion.

Approximately 26-30 wound botulism cases are reported annually in the United States, representing 30-40% of all botulism cases. Virtually all cases of wound botulism are found in the western United States, and three-quarters occur in California.



Infant botulism

9 cases of infant botulism have been reported in Orange County from January 1, 2015 until June 1, 2017. Case ages ranged from one to seven months. All cases required hospitalization, with a mean length of stay of 12.7 days (range 4-28 days); one infant required intubation, which lasted for two weeks.

Diagnosis

Botulism is diagnosed by demonstration of toxin in serum or stool, or by isolation of the bacteria in stool or wound culture. The diagnosis is confirmed by neutralization bioassay in mice. Testing may take over a week to complete, and is of varying sensitivity, depending on the clinical situation.

Treatment

Treatment of any form of botulism should be initiated immediately to prevent progression of paralysis based on clinical presentation and should not await laboratory confirmation.

- Foodborne or wound botulism is treated with botulism antitoxin, which should be given immediately and is available from the Centers for Disease Control and Prevention (CDC). OCHCA will help to procure antitoxin immediately. A heptavalent botulinum antitoxin type A to G of equine origin (BAT™) is currently the only antitoxin and specific treatment available in the US for treatment of non-infant botulism. Antitoxin neutralizes circulating neurotoxin molecules that have not yet bound to nerve endings. It slows disease progression but does not reverse symptoms.
- Any abscesses identified in a patient with wound botulism should be drained promptly.
- Infant botulism is treated with Human Botulism Immune Globulin for intravenous use (BabyBIG®; BIG-IV).
- **Both BAT and BabyBIG can be procured for treatment immediately by promptly contacting Orange County Public Health at 714-834-8180 (714-628-7008 after hours).**

For more information on botulism, see CDPH's botulism webpage at:

<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Botulism.aspx> or CDC's botulism web page at <https://www.cdc.gov/botulism/index.html>.

For more information on infant botulism, visit the California Department of Public Health's Infant Botulism Treatment and Prevention Program web site at <http://www.infantbotulism.org>

². Orange County Health Care Agency, Health Policy, Research & Communication