



<http://www.cdhd.wa.gov>

November 2013

# CHELAN-DOUGLAS PUBLIC HEALTH

## Current Conditions of Interest

### TO REPORT A NOTIFIABLE CONDITION:

Phone (509) 886-6400

Fax (509) 886-6478

**After hours call:**

(509) 886-6499

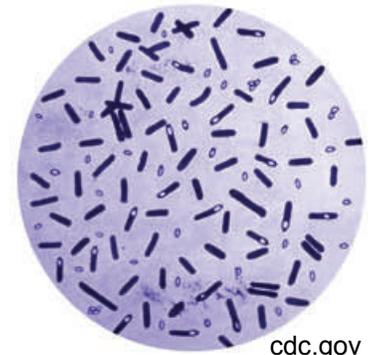
*"Always Working for a Safer and Healthier Community"*

## Wound Botulism

Information from June 2012 [Washington State Department of Health Botulism Reporting and Surveillance Guidelines](#).

### Etiologic Agent :

Botulism is a neurological disease caused by absorbing botulinum toxin into the blood. Botulism is caused by seven immunologically distinct toxins (A-F) produced by the gram-positive bacillus *Clostridium botulinum*, or rarely *C. butyricum* (type E toxin) and *C. baratii* (type F toxin). The toxins irreversibly block acetylcholine transmission across the neuromuscular junction and cause a characteristic syndrome. Recovery reflects reinnervation of paralyzed muscle fibers, which can take weeks or months in an adult.



*C. botulinum* forms spores which can survive under a wide range of adverse environmental conditions including boiling. The higher temperatures (>120.5°C/250.5°F) that can be achieved under pressure (e.g., in an autoclave or *properly functioning* home pressure cooker) are sufficient to kill even spores. Spore germination and bacterial growth occur only under anaerobic and low-acid to non-acidic (generally pH>4) conditions. Toxin is produced as the bacteria multiply. Botulinum toxin is heat-labile and can be inactivated by boiling for ten minutes. Toxin types A, B, and E are the most common sources of human disease; type E is highly associated with marine products (fish, seafood, or marine mammal meat). The toxin is a potential agent of bioterrorism.

### Botulism in Washington State:

During the last 10 years, Communicable Disease Epidemiology (CDE) has received 0–7 reports of wound botulism per year. Wound botulism is most frequently associated with injection drug use, particularly black tar heroin.



Black tar heroin

### Reservoirs:

*C. botulinum* spores are common in soil and elsewhere in the environment including on vegetables.

### Modes of Transmission:

Wound botulism results from a local *C. botulinum* infection in devitalized tissue at a wound site, where semi-anaerobic conditions occur. As with intestinal botulism, the toxin is produced *in situ* and absorbed into the blood. Wound botulism is increasingly reported in western states, especially due to intramuscular injection ("muscling") or subcutaneous injection ("skin popping") of black-tar heroin.

### Incubation Period:

The incubation period can be up to two weeks or longer.



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### Wound Botulism cont.

#### Description of Illness:

Botulism symptoms may include the "4 Ds" – dysphagia (difficulty swallowing), diplopia (double vision), dry mouth, and dysarthria (difficulty articulating) as well as blurred vision, ptosis (drooping eyelids), and muscle weakness. A descending, symmetrical flaccid paralysis starts with the facial muscles and may progress downward. Respiratory distress may ensue if the muscles of breathing are compromised. Mental alertness and peripheral sensation are typically maintained. Neurologic symptoms may be preceded or accompanied by mild gastrointestinal disturbance such as constipation, vomiting, or diarrhea. Severity of symptoms and rate of progression are highly variable, depending on dose and other factors. In severe cases, patients may survive only after months on a ventilator. Residual fatigue and shortness of breath can persist for years.

Botulism is frequently misdiagnosed in adults, most often as polyradiculoneuropathy (Guillain-Barré or Miller-Fisher syndrome), myasthenia gravis, or other diseases of the central nervous system.

#### Diagnosis:

Diagnosis of wound botulism is made by detecting botulism toxin in serum or by culturing *C. botulinum* from an infected wound. Stool should be obtained in addition to rule out foodborne botulism.

PHL performs presumptive (ELISA) and confirmatory botulism toxin assays, and *C. botulinum* cultures. Consult with Communicable Disease Epidemiology to arrange for testing.

#### Treatment:

Wound botulism is treated with heptavalent botulinum antitoxin. If antitoxin use is being considered, **IMMEDIATELY** consult with the CDE (1-877-539-4344). Wound debridement is indicated to remove devascularized tissue providing anaerobic conditions required for *C. botulinum* growth. There is a theoretical reason to postpone debridement until after antitoxin administration to avoid further toxin release. Antimicrobial therapy should also be considered.

Treatment should never be delayed pending laboratory confirmation of the diagnosis. All patients require close monitoring of ventilatory status, and severe cases need aggressive supportive therapy. Some patients require months on a ventilator. Fatigue and shortness of breath may persist.

Centers for Disease Control and Prevention (CDC) control the distribution of botulinum antitoxin, which is stocked at United States Public Health Service Quarantine Stations throughout the country. A Quarantine Station is located at SeaTac Airport in Seattle. If antitoxin treatment is being considered, **IMMEDIATELY** consult with CDE (1-877-539-4344). Personnel at CDC and SeaTac Quarantine station can arrange to have the antitoxin transported to the hospital where the patient is being treated.



Bilateral ptosis and multiple skin abscesses on legs.

Images from New England Journal of Medicine <http://www.nejm.org/doi/full/10.1056/NEJMicm1003352>.



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## Wound Botulism cont.

Figure 2.4 Past Month and Past Year Heroin Use among Persons Aged 12 or Older: 2002-2012

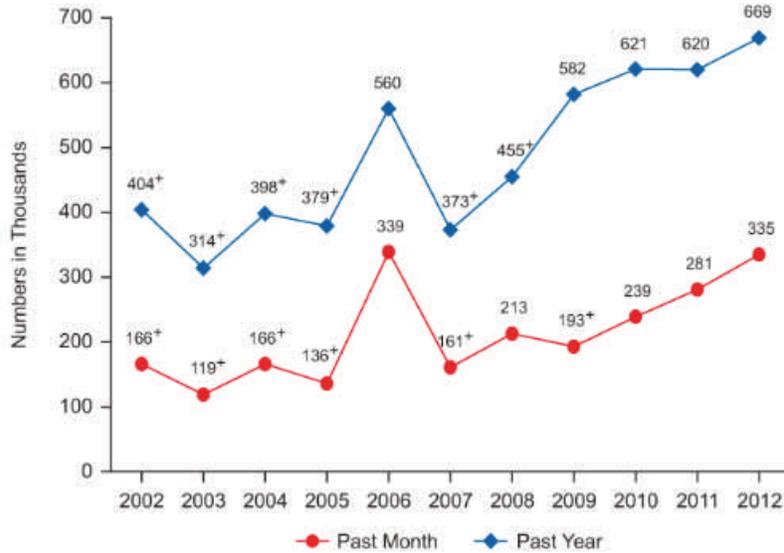
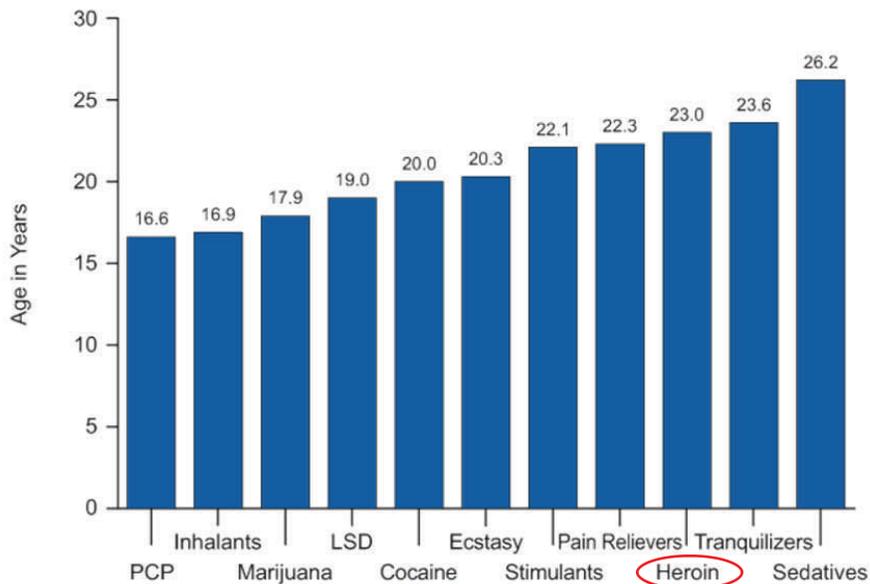


Figure 5.3 Mean Age at First Use for Specific Illicit Drugs among Past Year Initiates Aged 12 to 49: 2012



<http://www.samhsa.gov/data/NSDUH/2012SummNatFindDetTables/NationalFindings/NSDUHresults2012.htm#fig6.3>