





SEMP BioQuickies: *Botulism*

	Question	Answer
1.	Is botulism contagious between humans?	No. [However, botulinal poison can be produced by genetically-engineered contagious germs, such as smallpox and the hemorrhagic fever viruses. If this were the case, botulism <i>could</i> be contagious between humans via the host germ.]
2.	How do humans “catch” botulism?	A person can become severely poisoned with botulinal poison in four ways: a. <u>Foodborne botulism</u> occurs after eating or drinking food that contains the poison; b. <u>Wound botulism</u> occurs when the botulism germ enters a cut or other break in the skin and then releases the poison; c. <u>Intestinal botulism</u> occurs after eating or drinking food containing botulism germ spores, which then grow in the intestine, releasing their poison there; or d. <u>Inhalational (respiratory) botulism</u> may occur after breathing in air containing the poison, as in a terrorist attack.
3.	What are the hallmarks of botulism poisoning?	a. WEAK AND PARALYZED MUSCLES. These occur first in the head and face region (there is blurred vision, double vision, droopy eyelids, slurred speech, difficulty swallowing and dry mouth) and then travel down both sides of the body affecting the arms first, then the legs. Difficulty breathing develops when the chest muscles become paralyzed or very weakened. b. Symptoms usually start 12-36 hours after eating or drinking the poisonous food or breathing in the poisonous air. The shorter the “incubation period” (time from exposure to symptoms), the more severe is the case of botulinal poisoning. c. There is NO fever in botulinal poisoning. d. There are NO mental changes in botulinal poisoning (victims think clearly).
 <p style="text-align: center;">Fig. 1</p>		<p>Fig.1 “The symptoms of Botulism are apparent. This photo was taken four days after contraction.” Photo from: http://www.google.com/cobrand_univ?q=cache:K4zMQDVGeJwJ:www.hopkins-heic.org/forum/botpics.html+botulism&hl=en&ie=UTF-8</p>
4.	What else could the illness be?	a. The following illnesses are often confused with botulinal poisoning: Guillain-Barre syndrome, myasthenia gravis, stroke, intoxication with alcohol and other depressants (for example, carbon monoxide, nerve gas, organophosphates), tick paralysis, polio, and hysteria. b. Botulism differs from other illnesses that cause paralysis by its strong early effects on the ability to swallow, speak and move the eyes and eyelids. c. Whenever botulinal poisoning occurs in one or more victims, and no dietary source can be identified, terrorism with aerosolized poison must be suspected.
5.	When is a poisoned person <u>most</u> contagious to other humans?	Botulinal poison is not contagious between persons [however, see also Question #1].



Question	Answer
<p>6. How can a person avoid botulinal poisoning?</p>	<p>a. Always cook food for sufficient time, and at sufficient pressure and temperature, to destroy botulinal germs, their spores, and their poison. Untreated spores can survive weeks to months in the soil.</p> <p>b. Refrigerate incompletely processed foods.</p> <p>c. Boil, with stirring, home canned vegetables for at least 10 minutes to destroy botulinal poisons.</p> <p>d. Check for bulging container lids and “off-odors.” Do not eat or “taste test” contents. Return unopened bulging containers to vendor. Not all bulging containers are due to botulinal germs.</p> <p>e. Honey, a common source of botulinal germ spores, should not be fed to infants.</p> <p>f. Foods responsible for botulism should be boiled before discarding, or the containers should be broken and buried deeply in soil to prevent animals from eating the food.</p> <p>g. Contaminated utensils should be sterilized by boiling or by chlorine disinfection to inactivate remaining poisons.</p> <p>h. Wash your hands, particularly after handling soiled diapers.</p> <p>i. Be alert for FDA Class I recalls of contaminated foods. Class 1 recalls are for dangerous or defective products that predictably could cause serious health problems or death. “Examples of products that could fall into this category are a food found to contain botulinal toxin, food with undeclared allergens, a label mix-up on a life saving drug, or a defective artificial heart valve.” (http://www.cfsan.fda.gov/~lrd/recall2.html; http://www.fda.gov/bbs/topics/NEWS/NEW00540.html)</p> <p>j. If exposure to the toxin via an aerosol is suspected, in order to prevent additional exposure to the patient and health care providers, the clothing of the patient must be removed and stored in plastic bags until it can be washed with soap and water. The patient must shower thoroughly.</p>
<p>Fig. 2 “Canning to Avoid Botulism” Graphic from: http://www.fda.gov/fdac/features/095_bot.html</p>	
<p>Fig. 3 “Reported Cases Foodborne Botulism, United States 1988-1995” Graphic from: http://www.cfsan.fda.gov/~mow/chap2.html</p>	
<p>7. Where should poisoned persons receive care?</p>	<p>In an acute care hospital. Botulinal antitoxin may be required (See Question #11). Assisted ventilation, fluid and nutritional support may be required, sometimes for months at a time. Between 20 and 60 percent of poisoned patients will likely require mechanical ventilation. Some patients require rehabilitation for years after surviving botulism.</p>
<p>8. Who should be told of a suspected, probable or confirmed case of botulism?</p>	<p>Immediately notify the following of a suspected case of plague:</p> <p>a. Hospital epidemiologist or infection control practitioner.</p> <p>b. State and local public health department: IDPH: 217-782-4977; DuPage County Public Health: 630-682-7400</p> <p>c. Illinois Region VIII POD Hospital (Loyola): 708-216-8705</p> <p>d. Illinois Emergency Management Agency: 800-782-7860</p>



	Question	Answer
9.	Who besides persons with botulism symptoms should be isolated because of possible botulinal poisoning?	<ul style="list-style-type: none"> a. Suspicion of a single case of botulism should immediately raise the question of a group outbreak involving a family or others who have shared a common food, or a terrorist attack. b. Persons poisoned with botulinal toxin do not require isolation, but may require medical intensive care for weeks and sometimes months. c. All individuals who have been exposed to the contaminated food or other source, but who do not (yet) have symptoms, must come under careful medical observation near critical care services.
10.	What laboratory studies need to be performed?	The mouse bioassay should be conducted on blood, stool, stomach contents, and vomitus from the patient, and also on suspected contaminated foods. The mouse bioassay is available only at the Centers for Disease Control and approximately 20 state and municipal public health laboratories.
11.	What can be done to help poisoned persons get better?  <p style="text-align: right;">Fig. 4</p>	<ul style="list-style-type: none"> a. Therapy consists of passive immunization with equine antitoxin and supportive care, sometimes for many months. b. Rapid administration of antitoxin after diagnosis will minimize nerve damage and severity of the disease, but WILL NOT reverse the existing paralysis. Antitoxin may be withheld at the time of diagnosis only if it is certain that the patient is improving from maximal paralysis. c. In the U.S. botulinal antitoxin is available from the CDC via state and local health departments. d. Samples for testing must always be obtained BEFORE the antitoxin is given. e. One 10 ml vial per patient of antitoxin is usually sufficient to improve the course of the disease. f. Hypersensitivity reactions to horse antitoxin do occur. Patients should be given a small challenge dose of horse antitoxin before receiving a full dose. g. Antibiotics do NOT improve the course of the disease and certain antibiotics (aminoglycosides) may worsen it. They should be used only to treat secondary infections if they arise. <p>Fig.4 "Kenneth Tansey catches his breath following a physical therapy session. Tansey, 64, is one of only about two dozen people each year diagnosed with botulism—one of the most deadly bacteria to humans." Photo by <u>Jim Laurie</u>. http://www.reviewjournal.com/lvrj_home/1997/Feb-17-Mon-1997/news/</p>
12.	Is a botulinal poisoning vaccination available?	Yes. A botulinal toxoid is distributed by the CDC for laboratory workers at high risk of exposure to botulinal toxin, and the military for protection of troops against attack. The vaccine induces immunity over several months and, so, would not be effective for treating persons exposed to botulinal poison.
13.	How many people die from botulinal poisoning?	<ul style="list-style-type: none"> a. Between 1950 and 1959, 25 percent died. b. Between 1990 and 1996, 6 percent died. c. In spite of the increase in survival rate, in-hospital treatment for patients with botulism may be required for months, placing a stress on the health care system (e.g., need for critical care beds, critical care nursing, ventilators), particularly in a terrorist attack when many persons could be affected.



Question	Answer
14. What is important to know about housekeeping for a person with botulism?	a. <u>Soiled clothing and linens</u> : Should be disinfected per standard precaution protocols. b. <u>Environmental surfaces</u> (beds, bedrails, beside equipment, and other frequently touched surfaces and equipment): Should be disinfected per standard precaution protocols. c. <u>Handwashing</u> : Particularly important after handling soiled diapers.
15. How should the cadavers of poisoned persons be handled?	Cadavers should be handled using standard precautions, including hand washing and gloves.
16. Where can I get more quality information on botulism?	1. http://www.bt.cdc.gov/agent/botulism/index.asp 2. http://www.cdc.gov/ncidod/dbmd/diseaseinfo/botulism_g.htm 3. http://www.vnh.org/BIOCASU/17.html (Virtual Naval Hospital) 4. <u>Complete Guide to Home Canning, Preserving and Freezing</u> : United States Department of Agriculture, Dover Publications, 1999 edition. 5. <u>The Bad Bug Book</u> : USDA Center for Food Safety and Applied Nutrition: http://www.cfsan.fda.gov/~mow/intro.html 6. Henderson DA, Inglesby TV, O’Toole T: Bioterrorism: <u>Guidelines for Medical and Public Health Management</u> . AMA Press 2002, pp 141-161. 7. Chin, J: <u>Control of Communicable Diseases Manual</u> . American Public Health Association 2000, pp 70-75. 8. http://www.cfsan.fda.gov/~mow/botstuff.html (MMWR 44(11):1995 Mar 24: Foodborne Botulism--Oklahoma, 1994) 9. http://www.cfsan.fda.gov/~mow/botb.html (MMWR 44(2): 1995 Jan 20: Type B Botulism Associated with Roasted Eggplant in Oil—Italy 1993). 10. Using botulinal toxin to heal (e.g., strabismus, blephorospasm) http://www.fda.gov/fdac/features/095_bot.html 11. http://www.who.int/mediacentre/factsheets/who270/en/ 12. http://www.who.int/csr/delibepidemics/clostridiumbotulism.pdf (WHO botulism monograph)

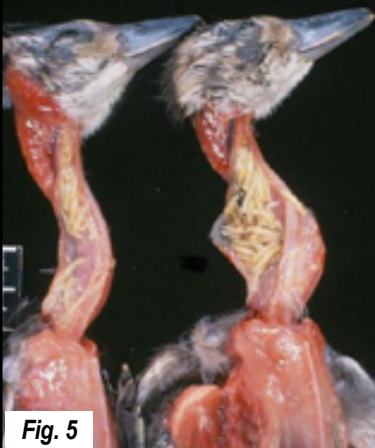


Fig. 5 “Northern Pintail ducklings dead of Type C Botulism in a natural outbreak. Each had fed heavily on maggots just prior to death. Each gram of the maggots pictured here contained enough Type C botulinum toxin to kill 10,000 laboratory mice.” Photo G. Wobeser. <http://wildlife.usask.ca/bookhtml/botulism/botulismc.htm>



Fig. 6 “Two Mallards showing relaxed paralysis of the neck muscles. Botulism has been called “Limber Neck” because of this feature of the disease. Such a bird on water could not hold its head above the water and would drown.” Photo G. Wobeser. <http://wildlife.usask.ca/bookhtml/botulism/botulismc.htm>



Fig. 7 Cow with Type C Botulism. Photo G. Wobeser. “During a major outbreak of Type C Botulism on Old Wives Lake, Saskatchewan in 1997, nine cattle pastured on the lake shore developed Type C Botulism. The most likely source of toxin for the cattle was maggots ingested while drinking lake water...” <http://wildlife.usask.ca/bookhtml/botulism/botulismc.htm>