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Terrorist Use of Toxins and Poisons Information for Laboratory Professionals

(U//FOUO) On November 9, 2010, the Department of Homeland Security (DHS) and Federal Bureau of Investigation (FBI) released a document entitled "Potential for Small-Scale Attacks Using Toxins and Poisons." This document states, "Terrorists continue to express broad interest in toxins and poisons that could be used to contaminate food or water supplies, or spread through skin contact." ⁱ Al-Qa'ida in the Arabian Peninsula (AQAP) advocated the use of poisons in attacks against the West in its English language magazine *Inspire*. In view of ongoing threats to the United States from AQAP, this information is being provided to ensure appropriate preparedness measures can be taken.

What Should I Do Now?

- Familiarize yourself with laboratory methods for screening and confirmation of a toxins/poisons attack.
- Review procedures for handling, analyzing, shipping, and/or referring samples for testing within the Laboratory Response Network (<http://www.bt.cdc.gov/lrn/>). For detailed laboratory information for chemical emergencies, please see <http://emergency.cdc.gov/chemical/lab.asp>. Please see <http://www.asm.org/images/pdf/Clinical/Protocols/botulismfinalversion73003.pdf> for information specific to botulinum toxin.
- Review procedures for reporting suspected chemical terrorism to appropriate agencies.
- Share this document and attached Roll Call Release with colleagues *with a valid need to know*, including sentinel/hospital laboratories and first responders.
- Stay alert for indicators of toxins and poisons attacks. The tetrodotoxin poisoning attempt that recently made national news reinforces the need to stay vigilant.
- Register on the HSIN-HPH portal for additional threat-related information, using the following link: <https://connect.hsin.gov/hph/event/registration.html>

Emergency Contacts

CDC Emergency Operations Center: **770-488-7100**

State Laboratory Point of Contact (Fill In): _____

State Health Departments: <http://www.cdc.gov/mmwr/international/relres.html>

Local Health Departments: <http://www.naccho.org/about/LHD/index.cfm>

State and Local Laboratories: <http://www.aphl.org/AboutAPHL/memberlabs/Pages/default.aspx>

Botulinum Toxin

- (U//FOUO) Botulinum toxin is one of the most lethal toxins. It is produced by the anaerobic spore-forming bacterium *Clostridium botulinum*, which is found in soil and aquatic sediment. Botulinum toxin causes a rare, muscle-paralyzing disease called botulism. Botulism is not contagious and the toxin cannot penetrate intact skin. Natural causes of botulism include ingestion of the preformed toxin in food and *in situ* production of toxin, either through a wound contaminated with *C. botulinum* or through colonization of the intestines of an infant (or rarely adult) with *C. botulinum*. A manmade exposure pathway for the toxin is inhalation. Ingestion and inhalation exposure are the most likely pathways for use in a botulinum toxin attack.ⁱⁱ
- Sentinel/hospital laboratories should notify both local public health officials and the state public health laboratory for approval to submit samples for testing.ⁱⁱⁱ
- Reference laboratories may test for presumptive identification of botulinum toxin in environmental samples, food, and cultures by LRN-distributed Botulinum Toxin ELISA A, B, E, and F kits.
- Reference laboratories may test for presumptive identification of neurotoxin-producing clostridia in cultures by LRN-distributed Botulinum Toxin Gene (A-G) Real Time PCR.
- Some reference laboratories may test for confirmatory indication of botulinum toxin in clinical specimens, environmental samples, and food by mouse bioassay.

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Cyanide

- Cyanide is a rapidly acting, potentially deadly chemical that can exist in various forms.^{iv}
- (U//FOUO) There are three primary exposure pathways that violent extremists are likely to use in an attack: inhalation, ingestion, and dermal. Cyanide salts can be used by themselves as poisons or reacted with other chemicals in improvised devices to produce hydrogen cyanide and cyanogen chloride gas.^v
- Sentinel laboratories should notify both local public health officials and the state public health laboratory for approval to submit samples for testing.^{vi}

Ricin

- Ricin is a poison found naturally in castor beans. If castor beans are chewed and swallowed, the released ricin can cause injury. Ricin can be made from the waste material left over from processing castor beans. It can be in the form of a powder, a mist, or a pellet, or it can be dissolved in water or weak acid.^{vii}
- (U//FOUO) The highest-risk ricin bioterrorism attack scenarios involve attacks through inhalation and ingestion exposure pathways, although the impacts are likely to remain localized.^{viii}
- There is no antidote for ricin toxicity.^{ix}
- Sentinel/hospital laboratories should notify both local public health officials and the state public health laboratory for approval to submit samples for testing.
- Reference laboratories may test for ricin in environmental samples using time-resolved fluorescence immunoassay or polymerase chain reaction (PCR).
- Reference laboratories may test for the ricin marker ricinine in clinical samples using HPLC-ESI-MS.^x

Specimen Collection

Specimen collection of suspected chemical agents should be conducted following CDC guidelines. For additional information on specimen collection, please see the following sites:

- <http://emergency.cdc.gov/labissues/pdf/chemspecimencollection.pdf>
- <http://emergency.cdc.gov/chemical/lab.asp>
- For botulism, see <http://www.asm.org/images/pdf/Clinical/Protocols/botulismfinalversion73003.pdf>

ⁱ DHS and FBI. (U//FOUO) Potential for Small-Scale Attacks Using Toxins and Poisons. 9 Nov 2010. Available at <https://cs.hsin.gov> [Registration required].

ⁱⁱ DHS. (U//FOUO) Infrastructure Protection Note: Botulinum Toxin (Small-Scale Attacks). 23 Apr 2010.

ⁱⁱⁱ American Society for Microbiology. Sentinel Laboratory Guidelines for Suspected Agents of Bioterrorism: Botulinum Toxin. Revised 30 July 2003.

^{iv} CDC. Facts About Cyanide. URL: <http://www.bt.cdc.gov/agent/cyanide/basics/facts.asp> Updated 27 Jan 2004.

^v DHS and FBI. (U//FOUO) Cyanide: Easily Obtainable Chemical of Interest to Terrorists. 18 Feb 2010.

^{vi} CDC. Cyanogen Chloride. Emergency Response Safety and Health Database. Reviewed 12 May 2011.

^{vii} CDC. Facts About Ricin. URL: <http://www.bt.cdc.gov/agent/ricin/facts.asp>. Updated 5 Mar 2008.

^{viii} DHS. (U//FOUO) Infrastructure Protection Note: Ricin. 23 April 2010.

^{ix} CDC. Ricin. Emergency Response Safety and Health Database. Reviewed 12 May 2011.

^x CDC. Laboratory Testing for Ricin. URL: <http://emergency.cdc.gov/agent/ricin/labtesting.asp>. Updated 23 Feb 2006