The Internet Journal of Rescue and Disaster Medicine
Volume 2 Number 1

Terrorism Awareness: Weapons Of Mass Destruction: Part II, Biological Weapons

P Smith

Citation

P Smith. *Terrorism Awareness: Weapons Of Mass Destruction: Part II, Biological Weapons*. The Internet Journal of Rescue and Disaster Medicine. 1999 Volume 2 Number 1.

Abstract

This article written in 4 parts. It covers the fields of terrorism awareness and some of the weapons used by terrorists: chemical, biological, radiological and explosive weapons.

BIOLOGICAL AGENTS

Biological agents are either disease causing organisms or toxins produced by a living organism. The disease causing organisms could be some type of bacteria, virus or rickettesia. All of which can be treated with antibiotics, while most toxins cannot.

- Bacteria are single celled organisms in plants, animals and humans that can cause diseases.
- Viruses are smaller than bacteria and live inside an individual host cell.
- Rickettesia are small cellular organisms that are smaller than bacteria but larger than a virus. They also live inside an individual host cell.
- Toxins are substances produced by living organisms including bacteria, plants and animals. They differ from chemical agents, in that most are not manmade. Biological toxins are some of the most toxic substances known.

BIOLOGICAL AGENTS

- Anthrax - Bacteria or Rickettesia
- Plague - Bacteria or Rickettesia
- Smallpox - Viral Agent
- Viral Hemorrhagic Fever - Viral Agent
- Venezuelan Equine Encephalomyelitis - Viral Agent
- Botulinum (Botulism) - Toxic Agent
- Staphylococcal Enterotoxins - Toxic Agent
- Ricin - Toxic Agent

Biological agents can be delivered or disseminated in several different ways. Through aerosol devices (inhalation), by sprinkling dried agent on food (ingestion) or direct skin contact (dermal exposure).

Aerosol dispersion is getting it into the air. A garden sprayer, a paint spray gun, or crop dusting devices can be used. All of which are very easy to obtain at any hardware or agricultural store.

Ingestion can be through contamination of food, water or even medicine. The agent can be sprinkled on food or mixed in food. Small amounts of post-processed water could be effected, similar to the spring water jugs you find in so many offices. Medically, we have seen this in the past, with the Tylenol murders several years ago.

The dermal route is through direct skin contact or possibly injection. The History Channel aired a special that showed how Georgi Markov, a Bulgarian journalist was killed in 1968. A small metallic ball the size of a pinhead was injected in the back of his leg while standing on the street corner in England. A Bulgarian agent, using a spring-loaded umbrella accomplished this. The agent within the ball was Ricin.

Biological agents are similar to the chemical agents, with one big difference, TIME. Most of the chemical agents act

quickly on the system, while the biological agents take hours, days or even weeks to act, depending on the amount of agent used.

Local hospitals, doctor offices or the new doc in the box, (Small Medical Clinics); will most likely discover the first signs of a biological incident. They will start to see a larger than normal influx of patients suffering the same types of symptoms or you may receive a call or letter informing you of the attack.

Several larger cities have had companies receiving hoax anthrax scares. A letter would be opened and a small amount of powder would get on the person opening it. The letter would say something like, “Congratulations, you have just been exposed to anthrax”. You can find a copy of the FBI’s Anthrax advisory in the appendices in the rear of this book.

Most biological agents must be either inhaled or ingested to affect you. Direct skin contact will only affect you if the skin is broken. An efficient way to avoid being infected is good personal hygiene. Sunlight will kill many of these types of agents. For this reason, most incidents involving these types of agents occur inside or at night.

Like chemical agents, biological agents can be obtained over the Internet and / or they can be derived from nature. Each agent has a natural host. With very little equipment and training, a small amount of agent can be cultured or grown into a large amount.

Anthrax is a naturally occurring bacterium in cattle, sheep and other hoofed animals. It can normally be transmitted through open injuries or broken sites on the skin. It can be inhaled if aerosolized. The mortality rate can reach as high as 95% in an aerosol release and 20% in an oral or dermal exposure.

Symptoms of an anthrax exposure include but are not limited to: itching, lesions, fever, chest pain, coughing, chills, nausea and vomiting and swelling of the lymph nodes. Symptoms are similar to that of the Flu. The incubation period is approximately one to seven days. You can receive a vaccination, which consist of a series of shots and then a booster once a year. The vaccine is said to be expensive and like most vaccinations, are not guaranteed in all inoculated people.

Plague, AKA Black Death, is a bacteria usually transmitted by an infected vector. Vectors are usually fleas, ticks or possibly misquotes. This agent can also be aerosolized, causing pneumonic plague. There is a mortality rate of 90 to 100%, unless treated with antibiotics.

The incubation period can be up to three days. Symptoms include but are not limited to; high fever, chills, headache, spitting up of blood and shortness of breath.

The World Health Organization declared smallpox eradicated in 1980. If someone could acquire this virus and aerosolize it, could be highly infectious and contagious. There is an incubation period of approximately twelve days. Symptoms include but are not limited to, general malaise (general weakness), fever, vomiting, headache and backache. A rash usually appears on the face, hands, and forearms, followed by the lower extremities and trunk. The mortality rate is approximately 30% for unvaccinated patients and only approximately 3% for vaccinated ones.

Venezuelan Equine Encephalomyelitis is only a mildly contagious disease. Incubation period is approximately five days. Birds and mosquitoes commonly spread it. Symptoms include but are not limited to, nausea, vomiting, cough, sore throat, high fever, general malaise, and pain in legs and lower back. In children there can be an inflammation of the brain, like in meningitis. The mortality rate could go as high as 20% in children. Antibiotics have little if no effect, supportive care of the symptoms is the only treatment. There is a potential vaccine, but it has not received FDA approval and is not available in the US.

Smallpox, Venezuelan Equine Encephalomyelitis and Viral Hemorrhagic Fevers are viruses that grow and reproduce by forcing the host to produce additional viruses. They are very fragile and very difficult to grow.

Botulinum (Botulism) is highly lethal and can be found in canned food and / or some poorly pre-cooked foods. Canned foods with swollen and bulging packages should be a clue that it is possibly spoiled. The onset of symptoms usually occurs within 72 hours. Symptoms include but are not limited to, general malaise (general weakness), dry mouth and throat, dizziness, nausea and vomiting and possibly blurred vision. The mortality rate could reach 60% if untreated with antitoxins and supportive measures.

Staphylococcal Enterotoxins is a toxin that is ingested and causes food poisoning. The incubation period is approximately six hours. Symptoms include but are not limited to, nausea and vomiting, abdominal cramps and explosive watery diarrhea. The effects last approximately eight hours. If this agent is aerosolized the symptoms

include but are not limited to; high fever, cough, chills and possibly general malaise (general weakness) which could last approximately two weeks. There are antitoxins available and supportive treatment is also recommended. The mortality rate is less than 1%.

Ricin is a strong and extremely lethal toxin derived from the castor bean plant. It is a byproduct of preparing castor oil. One milligram can be lethal. Symptoms include but are not limited to, flu like symptoms, with narcotizing (tissue death) to the respiratory tract, causing pulmonary edema (fluid in the lungs), gastric bleeding, liver and lymphoid death and inflammation of the spleen. The routes of entry include ingestion and injection. There have been some cases where absorption was possibly the route of entry. The incubation period is approximately 24 to 72 hours and there is a very high mortality rate.

For all the biological agents, decontamination is about the same. Wet the victim, strip off all necessary clothing; flush with water and the cover the patient. For decon of all these agents, it is recommended to use Water, Soap and Water or a 10:1 solution of Water and Bleach. Decon for any WMD event is just like that of a regular hazardous materials incident. Remember the patient's clothing and all personal articles are considered potentially contaminated evidence.

RESOURCES

- United States Department of Justice
- Center for Domestic Preparedness
- Office of Justice Programs Manuals
- United States Department of Transportation (DOT)
- United States Environmental Protection Agency (EPA)
- State of Alabama
- Emergency Management Agency
- Anti-Terrorism
- Personal Security Planning Guide
- (Alabama Dept of Public Safety)
- (Alabama National Guard)
- (Georgia Emergency Management)
- (The Federal Bureau of Investigations)
- (The Federal Emergency Management Agency)
- Alabama Department of Environmental Management (ADEM)
- The National Fire Academy
- Emergency Response to Terrorism
- The Mobile Alabama Fire-Rescue Department
- Chemical, Biological and Radiological
- Incident Response Guide
- The History Channel Special Reports and Documentaries
- Journal of American Medical Association August 1997
- Southern Poverty Law Center (SPLC)
- Militia Task Force

APPENDIX 1

ANTHRAX ADVISORY

FROM: WMD OPERATIONS UNIT OF THE FEDERAL BUREAU OF INVESTIGATION (FBI)

December 1998

Recently, there have been numerous anthrax scares caused by hoax letters advising the reader (victim) that anthrax was contained within the envelope. Some of these letters were found to contain a form of inert power (such as baby powder, detergent, or other common household materials) with an accompanying note advising the recipient that her or she had been exposed to anthrax. Other notes have merely contained the written statement advising the reader of the presence of anthrax, although no foreign substance was contained within the envelope. The reaction to these events by WMD first responders has resulted in quarantine, evacuation, decontamination, and chemoprophylaxis efforts. All cases thus far have been hoaxes.

First responders and potential victims should note that Anthrax spores are harmful only if inhaled, ingested, or introduced into an open wound or the eyes. Persons exposed to anthrax are not contagious and quarantine is thus not appropriate.

All first responders should follow local protocols for hazardous materials incidents involving biological hazards. Upon receipt of a threat, a thorough hazard risk assessment should be conducted. Upon notification, the FBI will coordinate a risk assessment in conjunction with the health department and other authorities on biological agents to ensure timely dissemination of appropriate technical advice.

Any contaminated evidence gathered at the scene should e triple-bagged. Individuals should be advised to wait for laboratory test result, which will be available within 48 hours. These individuals do NOT need to be placed on chemoprophylaxis while awaiting laboratory test results to determine whether an infectious agent was present.

The individual needs to be instructed that if they become ill before laboratory results are available, they should immediately contact their local health department and proceed immediately to a pre-determined emergency department, where they should inform the attending staff of their potential exposure.

Responders can be protected from anthrax spores by donning splash protection, gloves, and a full-face respirator with High Efficiency Particulate Air Filters (HEPA) (Level C) or self-contained breathing apparatus (SCBA) (Level-B). Victims who may be in the immediate area and are potentially contaminated should be decontaminated with sop and water; no bleach solutions are required. A 1:10 dilution of household bleach (i.e., Clorox-5.25% hypochlorite) should only be used if there is confirmation of the agent and an inability to remove the materials through soap and water decontamination. Additionally, the use of bleach decontamination is only recommended after soap and water decontamination, and should be rinsed off after 10 to 15 minutes.

Technical assistance can be immediately provided by contacting the National Response Center at (800) 424-8802.

IMPORTANT:

If the envelope or package remains sealed (not opened), then first responders should not take an action other than notifying the FBI and packaging the evidence. Quarantine, evacuation, decontamination, and chemoprophylaxis efforts are NOT indicated if the envelope or package remains sealed.

Also, anthrax will likely be visible as a powder or powder residue. The absence of visible powder is a strong indicator that anthrax is not present.

The use or threatened us of a weapon of mass destruction (including anthrax) s a violation of federal law. See Title 18 United States Code, Section 175 and Section 2332a. It should be reported to the FBI immediately.

This information is provided by the WMD Operations Unit of the Federal Bureau of Investigation and the National domestic Preparedness Office (NDPO), in coordination with the Centers for Disease Control, the Department of Health and Human Services/Office of Emergency Preparedness, and the U. S. Army Medical Research Institute of Infectious Diseases (USAMRIID). The NDPO was established to coordinate the Federal Government's efforts to prepare the nation's response community for threats involving Weapons of Mass Destruction. Contact you local FBI office if confronted by a WMD threat.

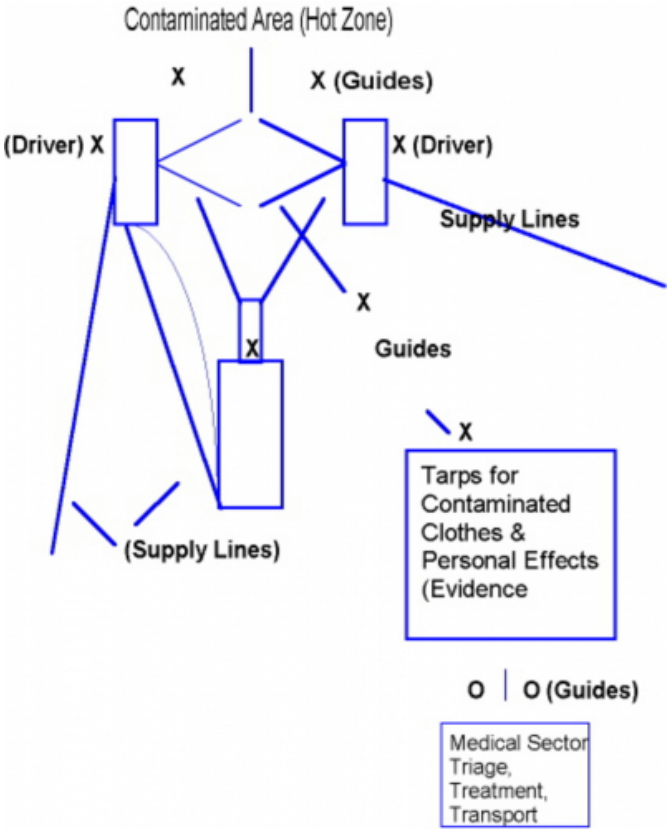
APPENDIX 3

Click Here (Word Document)

APPENDIX 4

Figure 1

Mobile Fire-Rescue Department: Chemical, Biological, And Radiological Incident Response Guide



References

Author Information

Paul R Smith, REMTP
Fire Service Captain, Rural/Metro Emergency Response Training, Florida 1 DMAT, Mobile Fire Rescue Department