



Environmental Health  
& Engineering, Inc.  
60 Wells Avenue  
Newton, MA  
02459-3210

Tel 800-825-5343  
617-964-8550  
FAX 617-964-8556

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This guidance document is provided to employees, clients, and colleagues of Environmental Health & Engineering, Inc. (EH&E) as a public service, to provide assistance in dealing with current environmental health and safety issues. Extreme care has been taken in the preparation of the document and all contents are believed to be accurate at the time of publication.

## **ANTHRAX, BIOTERRORISM, AND MAIL-HANDLING PRACTICES**

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### **1. What is anthrax?**

Anthrax is a disease caused by a specific type of bacteria, called *Bacillus anthracis*. This type of bacteria is commonly found in soil and thrives under optimal growth conditions (e.g., lower pH, repeated soaking, and drying cycles). The active bacteria are rod-shaped and can produce round spores that can remain viable (able to grow) for many years. These spores are approximately two to six microns in size (a human hair is about 50 – 100 microns in diameter).

Although they are very drought tolerant and can withstand direct sun exposure for several hours, they can be killed by common off-the-shelf disinfectants, such as bleach.

Several natural disease outbreaks have been recorded in historical texts, the earliest is believed to be noted in the Book of Exodus. It typically infects grazing animals, such as cattle, sheep, horses, and goats, when they ingest the soil-borne bacteria as they eat. In the past century, disease from anthrax was an occupational hazard for individuals handling livestock and other hoofed animals. Those individuals that dealt with processing animal hide and certain animal hair (e.g., goat) were particularly at risk. The advent of proactive veterinary practices and vaccinations has virtually eliminated the threat of anthrax from our food supply.

## **2. How can I be exposed to anthrax?**

An individual can be exposed to the live bacteria or to the spore form. Since the active bacteria are sensitive to environmental changes and stresses, the spore is the most likely bacterial form that a terrorist would use to create a threat. There are three ways an individual can be exposed:

- *Skin.* Exposure to anthrax through cuts or sores in the skin is the most common exposure pathway and accounts for over 90% of the documented cases. This type of exposure results in the most curable form of anthrax disease which can be treated with available antibiotics.
- *Ingestion.* This exposure route usually results from ingesting contaminated food products. It is very rare. The potential for exposure through this route has been virtually eliminated by modern veterinarian practices and food handling protocols.
- *Inhalation.* Exposure to the anthrax bacterium can also occur by inhaling the spores. An individual needs to inhale and retain a fairly large number of spores (perhaps as much as 8,000 to 10,000 spores) to result in disease. This would require that an individual be exposed to a large amount of airborne spores over a short period of time or exposed to a lower level of spores over a much longer period. Short, brief exposures to low or moderate levels of anthrax are likely to be insufficient to produce disease.

### **3. What are the signs and symptoms of exposure?**

Disease caused by the anthrax bacteria varies by the exposure pattern. After a skin exposure, a red bump appears on the area of exposure (similar to an insect bite) within one half to twelve days and may develop a blister-like appearance. The blister typically transforms into a painless ulcer with a black center. This form of anthrax is almost always treatable.

When anthrax bacteria are ingested, the symptoms will appear in one to seven days and appear like a gastrointestinal flu or “bug.” It progresses to abdominal pain, vomiting of blood, and severe diarrhea. Untreated, the disease can cause serious harm or death.

When anthrax bacteria are inhaled, flu-like symptoms appear after one to six days (fever, chills, cough, headache, etc.). After several days, the symptoms subside; however, they return in one to three days and progress rapidly into a more serious, life-threatening symptom profile. This form of anthrax exposure is the most serious and results in the highest number of deaths of those exposed.

### **4. Can anthrax be cured?**

Fortunately, there is an antibiotic for anthrax. In fact, it was one of the first bacterial diseases for which immunization was developed, back in 1881. Ciprofloxacin, commonly referred to as Cipro, can effectively treat anthrax. Anthrax also responds to other standard antibiotics as well (e.g., penicillin). The success of the treatment depends upon the time interval between exposure and dosing with Cipro. Early detection and treatment is the key to managing the disease.

### **5. Is it contagious?**

No. There have been no known cases of an individual infected with inhaled anthrax spreading anthrax to another human. It can not be spread like influenza (the flu) or tuberculosis (TB). Skin to skin contact with the infected area can potentially spread the disease to another human where anthrax was contracted by skin exposure.

## **6. Is the mail an effective way to expose people to anthrax?**

The most likely exposure scenario from handling contaminated mail is skin exposure. Incidental ingestion of spores from eating with contaminated hands is less likely, provided that standard hygiene practices are observed (hand-washing before meals or handling food articles). Inhaling anthrax spores by handling or opening contaminated mail is also less likely for several reasons. Although the individual spores are small and easily inhaled, in the delivery matrix (powder), the spores tend to cling together in larger clumps due to electrostatic effects. These effects make the spores more difficult to inhale and they settle out of the air much faster, reducing exposures. Also, to create a short, intense exposure, a fairly vigorous process must be used to break up the spore clumps and suspend a large number of spores into the air. For certain processes that incorporate vigorous agitation, additional respiratory precautions may be prudent.

## **7. What features make a package or envelope suspicious?**

The US Postal Service and the FBI have developed a profile of suspicious packages that require special handling procedures. The following is a brief listing of those elements:

- Unfamiliar packaging.
- Wrong address, outdated address, misspelled address.
- Sent to someone no longer with company.
- Packages marked "Personal" or "Confidential."
- Missing or incomplete return address.
- Unusual weight, given their size, oddly shaped, or lop-sided.
- Poor or incomplete packaging.
- Protruding wires, stains, or odors.
- Postmark city or state does not match return address.
- Excessive postage.

**8. Is there a quick preliminary test that can be performed to indicate the presence of anthrax bacteria?**

Yes, there are field tests that can be performed that can indicate the presence of anthrax bacteria in one to fifteen minutes.

**9. What should I do if I find a suspicious envelope?**

If you encounter a suspicious envelope or package:

- Isolate and cover the package.
- Clear the immediate area.
- Notify your supervisor immediately.
- Do not remove any other articles in close proximity to the package, including any transport carrier.

If you open a letter or package and notice a powdery substance on the letter or dust/powder falling out of the envelope:

- Gently place the article on the work surface and do not continue to handle it.
- Verbally notify other employees to clear the area.
- Have co-workers notify the area supervisor.
- Gently remove any contaminated clothing by folding it in on itself to contain the powder and to prevent the powder from becoming airborne.
- Visually assess the level of contamination on remaining clothing.
- If no other visible evidence of contamination is evident, especially on lower legs and shoes, proceed to the nearest bathroom to wash all affected areas with soap and warm water.
- If a shower is available, shower whole body with soap and warm water.
- Await further instructions from your supervisor and/or emergency response personnel. Do not leave work.

## 10. How can I protect myself?

The best protection is through a simple but diligent screening program for packages and envelopes. Refer to question #7 for the recommended criteria for screening packages. Suspicious packages should be placed aside in a designated area or container for further evaluation by trained personnel. This will greatly limit the potential for accidental contact with anthrax due to a terrorist threat.

Additional measures can include the use of gloves and long sleeved shirts, blouses, coats, or jackets to prevent skin contact. Low allergen, hypoallergenic, non-powdered latex gloves are preferred, but some individuals may be sensitive or allergic to latex and this must be considered prior to using them in the workplace.

For most mail-room operations, respirator protection is not necessary. Operations that involve vigorous shaking of packages or envelopes should be conducted separately and the need for additional respiratory precautions should be assessed and defined.

## 11. Where can I go for more information?

Many Government web-sites have very good information resources. You can also contact your local board of health. The following is a short list of relevant internet sites:

Centers for Disease Control  
Atlanta, GA  
[www.cdc.gov/ncidod/dbmd/diseaseinfo/anthrax\\_g.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/anthrax_g.htm)  
[www.cdc.gov/ncidod/EID/vol5no4/cieslak.htm](http://www.cdc.gov/ncidod/EID/vol5no4/cieslak.htm)

United States Postal Service  
Washington, DC  
[www.usps.gov/news/2001/press/pr01\\_1010tips.htm](http://www.usps.gov/news/2001/press/pr01_1010tips.htm)

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