What is Anthrax?

Anthrax is an infection caused by a bacteria *Bacillus anthracis.* It is a naturally occurring disease known from the times of Moses and annotated in the annals of the Romans. Found throughout the world in Africa, Asia, Europe, North/South America, & Middle East, this bacteria hibernates in the form of spores. These spores live in the soil and are incredibly heat-, cold- and drought-resistant, allowing them to survive for many years despite harsh conditions.

How do you catch Anthrax?

In the natural cycle, domestic livestock (such as goats, sheep & cattle) would get anthrax from the soil and transmit it to humans. Humans would get anthrax either directly from these infected animals, OR from contaminated animal by-products (such as meat, wool, hides, etc.). Consequently, anthrax was primarily considered an occupationally-related disease. Those in high-risk professions included: sheep shearers, wool sorters, veterinarians, and those who worked in slaughterhouses, or with leather & hides.

How would you get an Anthrax infection in the setting of biological weapons and terrorist activity?

When we use the term biological weapon, we generally refer to the intentional use of biological organisms to harm or kill people—whether it be on a small or large scale. If anthrax was used maliciously to inflict harm, individuals would get different types of infections depending on how they were exposed to the anthrax organism. If anthrax spores were introduced into a superficial cut or wound (on your finger for example, when opening a contaminated envelope) you would get CUTANEOUS Anthrax. If you ate contaminated meat or somehow ingested Anthrax spores, you would get GASTROINTESTINAL Anthrax. And, if you breathed in a large amount of anthrax spores, you would get the RESPIRATORY form of Anthrax.

An important concept to remember is that anthrax is not contagious: YOU CAN'T GET ANTHRAX FROM SOMEBODY ELSE, since anthrax is not spread from person-to-person! One gets the infection only after they've been exposed to anthrax spores.

What are the various symptoms of Anthrax?

CUTANEOUS ANTHRAX ***(skin)***

The initial symptoms of the skin form of Anthrax is a small itchy (but painless) bump just like an insect bite, which develops 3-5 days after Anthrax spores get into a scratch or wound. Soon after, the bump will turn into a blister, then a small boil (1-3cm). It then evolves into a depressed, painless ulcer and develops a characteristic black center or scab.

Often, there is enlargement of the local lymph nodes, with redness and swelling of the surrounding area. The sores resolve over the next 1-2 weeks, and there is often no scarring. These skin lesions usually develop on the arms, hands, or face. This makes sense if you remember that the anthrax spores have to be rubbed into an open wound or break in the skin.

- ***GASTROINTESTINAL ANTHRAX*** ***(stomach)***

  Several days after ingesting contaminated food, a patient will present with nausea, vomiting, and a poor appetite, which then develops into more severe abdominal pain and bloody diarrhea. This is a pretty severe form of the disease which will require hospital admission and IV antibiotics.

- ***RESPIRATORY ANTHRAX*** ***(lungs)***

  Patients will present with typical flu-like symptoms, 1-6 days after inhaling anthrax spores into the lungs. After a few days there is a rapid decline, with progressive shortness of breath, heart/lung failure, and then the development of septic shock and death. Respiratory anthrax can be particularly fatal, especially if antibiotics aren't given early in the course of the disease.

  When discussing the typical flu-like symptoms that are seen with anthrax, we are primarily referring to fever, chills, muscle aches, fatigue, nonproductive cough, and chest discomfort. Remember, that we are coming upon the cold and flu season. Consequently, it may be a somewhat difficult to discern the distinction between anthrax and flu. Often, flu will have more nasal congestion, runny nose, sore throat and a productive cough with phlegm. Also remember that Anthrax is NOT contagious, whereas the cold and flu are easily spread from person to person. *Note: If your child returns from school sick, and then the rest of the family gets sick, this is in all likelihood the cold or flu. Both anthrax AND typical viral illnesses (flu & colds) can often be prevented by good hand washing!*

How do you treat Anthrax?

Anthrax is easily treated with a variety of antibiotics—penicillins, doxycycline, along with Cipro and other medications in the same class. Just to reassure everyone—we do have plenty of medications here on Okinawa, if the need arises. Which medications are prescribed depend on what the scenario is, and whether we're treating an elderly person, a child, a pregnant woman or someone who has medication allergies. One must realize, that not everyone who's been exposed is going to get infected—this is an important distinction to appreciate—the difference between exposure and infection. We will definitely treat all those who are infected; but we may or may not decide it is necessary to treat all of those who have been exposed, depending on the scenario.

What about prophylactic antibiotics?

Prophylactic antibiotics refers to the treatment of an individual that has been exposed to anthrax so that they won't develop an infection. People who receive prophylactic antibiotics generally take medications for 60 days to prevent any manifestations of anthrax disease. A lot of people are concerned about being prepared and having antibiotics handy "just in case". Back in the United States, there's some panic and hysteria and quite a few people have been trying to get Cipro either from the internet, or from their doctors.

There are many reasons for not acquiring antibiotics. Some of the main concerns are that 1) Cipro may not be the right medication for them; 2) that there will be a shortage of Cipro and it won't be available when we need it because people are hoarding and stockpiling the medication; and 3) that individuals will be taking these pills indiscriminately, when they have NOT been exposed to Anthrax because of their excessive fear and anxiety. The result will be an increase in the drug-resistance of the different bugs (bacteria)—drug resistance is a real and legitimate concern, because it will make it so much harder to kill all the ordinary infections (like bladder infections). If we use antibiotics prudently now, we'll have greater options in the future.

Which antibiotic is better—Cipro or Doxycycline?

Both Cipro and Doxycycline are equally effective in treating the various forms of anthrax. Both are approved by the Food and Drug Administration for this use, and both are recommended by the Centers for Disease Control (CDC) for treating anthrax. Doxycycline is being recommended over Cipro for more logistical reasons. First, doxycycline is cheaper and more readily available. It is also better tolerated by the majority of patients, and is specifically recommended in our elderly patients. *(Note: Because elderly persons usually have more underlying medical problems and a weaker immune system, they are at a greater risk of getting anthrax.)* Finally, doxycycline is being recommended because it will not cause the selection for drug resistance bacteria, which is a concern with Cipro since it is such a "big" broad-spectrum antibiotic.

How do you diagnose Anthrax?

Samples are taken from blood, respiratory secretions, other bodily fluids (e.g. spinal fluid) or skin lesions. From these specimens, the bacteria which causes Anthrax disease (*Bacillus anthracis*) is isolated and grown in the laboratory under special conditions.

Can nasal swabs diagnose Anthrax?

At present, the Centers for Disease Control (CDC) does not recommend the routine use of nasal swab testing to determine whether a person has been exposed to anthrax.

This test is reserved primarily for the public health officials to determine the extent of spore dispersion in the process of their investigation.

If the nasal swab from an individual is positive, then this would indicate that they were exposed but would not be able to determine that the person is necessarily infected. A negative result does not necessarily exclude the possibility of an exposure. Consequently, the results of nasal swab testing should not ultimately change whether a patient is treated with antibiotics.

How do you know if you've been exposed to Anthrax?

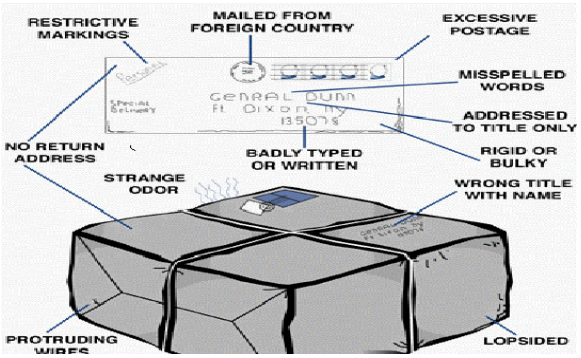
If somebody has intentionally and maliciously put anthrax in the air, it might be difficult to detect because anthrax spores are so small that you can't see them, smell them or taste them. Because it requires a lot of sophistication, it is unlikely that this scenario will present itself.

However, as it has been demonstrated in the United States, Anthrax delivered in a suspicious package may be a reality. In this setting, anthrax spores would look like a fine white powder (like talc) or in it's more impure form Anthrax resembles brown clumps or granules (like wheat germ).

What do you do if you receive a suspicious package?

There are certain clues that you should raise your concern when receiving packages from unknown sources. Packages should be considered suspicious if they have no return address, excessive postage, misspelled words, or poor handwriting. Other characteristics include a poorly wrapped bulky package, with excess tape, oily stains, odors, protruding wires or powders leaking out.

If you receive such a package—treat it as if it was a bomb—don't open it, leave the room, keep others away, wash your hands and call 911.



If a person is suspected of being exposed to anthrax, should they be quarantined or should family members be tested?

Remember that anthrax is not contagious, therefore individuals don't need to be quarantined and others do not need to be tested unless they were exposed to the same source. If there is some concern that an individual was recently contaminated (e.g. by opening a suspicious package) call 911, minimize the spread of the anthrax spores by placing the package and your contaminated clothes in separate plastic bags, then take a shower with plenty of soap and water as soon as possible.

What can you do to protect yourself against anthrax or other bioterrorist activity?

Do not panic, everything that's a white substance is not anthrax. There's a tendency to hysteria right now and much of it is unfounded. That being said… it's important to remain vigilant. Don't open suspicious packages, and be wary of strangers. If you have concerns about a suspicious package or situation, CALL 911.

Perhaps the most important things that you can do during these stressful times, is to eat right, sleep well, exercise regularly, engage in stress reduction activities, spend time with your friends & family, and basically just TAKE CARE OF YOURSELF—particularly since the most effective prevention against any infection is to maintain a strong immune system. If you were really concerned about terrorist activity, standard typhoon precautions would be prudent.

Take home concepts about anthrax…

1. Remember that in order to get the disease, you have to first be exposed to anthrax spores.
2. Then, those spores need to somehow enter the body either through the skin, being swallowed, or inhaled.
3. If one actually has the disease, anthrax can be prevented by early treatment with antibiotics.
4. Finally, Anthrax is not spread from person to person.

Where can I get more information?

For further information, please refer to the webpage that has been created on anthrax and other bioterrorism agents at **USNH's website**: www.med.navy.mil/sites/nhoki. This webpage provides general information on a variety of biological agents and has helpful links to other websites.

Another helpful website is the **Centers for Disease Control and Prevention** located at: www.cdc.gov

Or, contact your local health care provider if you have further questions.

Anthrax FAQ's

Prevention and Care

U.S. NAVAL HOSPITAL
OKINAWA, JAPAN