

ANTHRAX Fact Sheet

(Malignant edema, Malignant pustule, Woolsorter's disease, Ragpicker's disease)

Agent: The spore-forming bacterium *Bacillus anthracis*, which has three virulence factors: edema toxin, lethal toxin, and a capsular antigen.

Brief Description: An illness with acute onset characterized by several distinct clinical forms, including the following:

- *Cutaneous* (resulting from introduction of the organism through the skin): a skin lesion evolving during a period of 2-6 days from a papule, through a vesicular stage, to a depressed, painless black eschar. This is the most common form, accounting for 95% of all anthrax cases.
- *Inhalation* (resulting from introduction of the organism into the respiratory tract): a brief prodrome resembling a viral respiratory illness, followed by development of hypoxia and dyspnea, with radiographic evidence of mediastinal widening, pleural effusion, and sometimes lung consolidation. Usually fatal.
- *Intestinal* (resulting from ingestion of the organism): initially nausea, vomiting, and abdominal pain, then severe abdominal distress followed by fever and signs of septicemia.

If left untreated in humans, the case-fatality rate of untreated cutaneous anthrax ranges between 5% and 20%. For inhalation and intestinal cases, the case-fatality rate among those untreated can approach 100%. Anthrax is considered to be a likely agent to be used in acts of biological terrorism.

Reservoir: Anthrax is primarily a zoonotic disease of herbivores, with cattle, sheep and goats being the usual domesticated animal hosts. Animals shed the bacilli at death, and spores are formed upon exposure to the air. *B. anthracis* spores are very resistant to harsh environmental conditions and disinfection, and may remain viable in soil for many years.

Mode of Transmission: Human disease may be contracted by handling contaminated hair, wool,

hides, flesh, blood and excreta of infected animals and from manufactured products such as bonemeal containing spores. Accidental infection may occur among laboratory workers. Infection is introduced through scratches or abrasions of the skin, wounds, inhalation of spores from animal hides or products, or eating insufficiently cooked infected meat. Human disease also could occur following the deliberate dissemination of spores.

Incubation Period: One to seven days (up to 60 days possible)

Laboratory criteria for diagnosis:

- Isolation of *Bacillus anthracis* from a clinical specimen, or
- Anthrax electrophoretic immunotransblot (EITB) reaction to the protective antigen and/or lethal factor bands in one or more serum samples obtained after onset of symptoms, or
- Demonstration of *B. anthracis* in a clinical specimen by immunofluorescence

Diagnostic Testing:

A. Anthrax culture

1. Specimen: Vesicular fluid, blood, or respiratory secretions.
2. Lab Form: Form 3410
3. Test Performed: Culture and identification
4. Lab: Bacteriology, Georgia Public Health Laboratory

B. Sera

Immunofluorescence testing or EITB can be conducted at CDC, with prior arrangement through the State Public Health Laboratory. ***Important: All specimens should be submitted to the State Public Health Laboratory, not sent directly to the CDC.***

Case Classification:

- **Suspected:** A case that is clinically compatible and that has an epidemiologic link to animal cases or contaminated animal products
- **Confirmed:** A clinically compatible case that is laboratory confirmed

Period of Communicability: Direct person-to-person spread of anthrax does not occur. Articles and soil contaminated with spores may remain infective for decades.

Vaccine: Evidence suggests that a currently produced vaccine is effective in preventing cutaneous and inhalation anthrax. Routine vaccination is recommended for individuals (laboratorians) engaged in work involving production quantities or concentration of *B. anthracis* cultures and in activities with a high potential for aerosol. Vaccine may be indicated for individuals who come in contact with imported animal hides, furs, bonemeal, wool, animal hair and bristles in the workplace and to workers who handle potentially contaminated industrial raw materials. The Department of Defense is also currently vaccinating all U.S. military personnel because anthrax is considered a potential biological warfare agent. Anthrax vaccines intended for animals should not be used in humans. Currently, the vaccine is only available through the U.S. Department of Defense.

Treatment: Ciprofloxacin, doxycycline, and penicillin are the drugs of choice for treatment of anthrax. Due to concerns about the possible presence of beta-lactamases in naturally occurring or bioengineered anthrax, ciprofloxacin or doxycycline should be given until results of antibiotic susceptibility tests are known. Treatment for inhalation anthrax should be continued for 60 days. A 7- to 10-day course of antibiotic therapy is recommended for treating cutaneous anthrax, but if there is a possibility of aerosol exposure treatment should be extended to 60 days. Most *B. anthracis* strains are naturally resistant to cephalosporins. (See *MMWR* 2001; 50(42): 909-919

for more information about treatment of anthrax.)

Post-exposure Prophylaxis: Ciprofloxacin and doxycycline should be used for post-exposure prophylaxis until antibiotic susceptibilities are known. Therapy should be continued for 60 days. Post-exposure prophylaxis is only recommended for persons who may be at risk of inhalational anthrax from aerosol exposure. (See *MMWR* 2001; 50(41): 889-893 for more information about post-exposure prophylaxis for anthrax.)

Investigation: Search for history of exposure to infected animals or animal products to determine if infection is accidental or intentional. Documented infection in persons who do not have known occupational or livestock exposures may be one clue that intentional transmission has occurred.

Reporting: Report suspect or confirmed cases **IMMEDIATELY** by phone to the local health department, District Health Office, or the Epidemiology Branch at (404) 657-2588. If calling after regular business hours, it is very important to report cases through the Epidemiology Branch answering service (770-578-4104). After verbal report has been made, please transmit the case information electronically through the State Electronic Notifiable Disease Surveillance System (SENDSS) at <http://sendss.state.ga.us>, or complete and mail a GA Notifiable Disease Report Form (#3095). A single case of inhalation anthrax is so unusual that it should be reported immediately to both public health and law enforcement authorities for consideration of a bioterrorist source.

Trends: Between 1990-2000, there were no reported cases of human anthrax in Georgia. Incidence is extremely low in the United States.

References:

1. Centers for Disease Control and Prevention. Bioterrorism Alleging Use of Anthrax and Interim Guidelines for Management — United States, 1998. *MMWR* 1999; 48(4): 69-74.
 2. Centers for Disease Control and Prevention. Case Definitions for Infectious Conditions under Public Health Surveillance. *MMWR* 1997; 46(No. RR-10): 1-55.
 3. Chin J, ed. ANTHRAX. In: Control of Communicable Diseases Manual. 17th ed. Washington, DC: American Public Health Association, 2000: 20-25.
 4. Inglesby TV, Henderson DA, Bartlett JG, Ascher MS, Eitzen E, Friedlander AM, Hauer J, McDade J, Osterholm MT, O'Toole T, Parker G, Perl TM, PK, Tonat K, Working Group on Civilian Biodefense. Anthrax as a biological weapon: Medical and public health management. *JAMA* 1999; 281(18): 1735-1745.
 5. Russell PK. Vaccines in Civilian Defense against Bioterrorism. *Emerging Infectious Diseases* 1999; 5(4): 531-533
 6. CDC. Update: Investigation of Anthrax Associated with Intentional Exposure and Interim Public Health Guidelines, October 2001. *MMWR* 2001; 50(41): 889-893.
 7. CDC. Update: Investigation of Bioterrorism-Related Anthrax and Interim Guidelines for Exposure Management and Antimicrobial Therapy, October 2001. *MMWR* 2001; 50(42): 909-919.
- Center for Civilian Biodefense Studies – <http://www.hopkins-biodefense.org/index.html>
 - Medical Management of Biological Casualties Handbook – <http://www.nbc-med.org/SiteContent/MedRef/OnlineRef/FieldManuals/medman/Handbook.htm>

Links:

- Georgia Division of Public Health Bioterrorism Website – <http://health.state.ga.us/programs/emerp/ep/bioterrorism.shtml>
- CDC Anthrax FAQ – http://www.cdc.gov/ncidod/dbmd/diseaseinfo/anthrax_g.htm
- CDC Bioterrorism Preparedness and Response – <http://www.bt.cdc.gov/>
- Department of Defense: Arm Yourself Against Anthrax – <http://www.anthrax.osd.mil/>