

Report Immediately
by phone
If bioterrorism suspected

ANTHRAX

Potential Bioterrorism Agent: Category A

Also known as Woolsorter Disease

Responsibilities:

Hospital: Report immediately by phone if bioterrorism suspected, otherwise within 1 day

Lab: Report by phone immediately if bioterrorism suspected, otherwise within 1 day. Send isolates to the State Hygienic Laboratory (SHL) for confirmation

Physician: Report immediately by phone if bioterrorism suspected, otherwise within 1 day

Local Public Health Agency (LPHA): Follow-up required. Iowa Department of Public Health will lead the follow-up investigation.

Iowa Department of Public Health

Disease Reporting Hotline: (800) 362-2736

Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Anthrax is a disease caused by the bacterium *Bacillus anthracis*. It is primarily a disease of wild and domestic animals.

B. Clinical Description

Anthrax is an acute bacterial disease, which usually involves the skin, but may involve the upper throat, lower respiratory tract, chest cavity or intestinal tract. Toxins produced by the bacteria cause the tissue and organ damage associated with anthrax.

In anthrax affecting the skin (cutaneous anthrax), itching of an exposed skin surface occurs first. Itching is followed by a small red lesion that progresses to a blister and, ultimately, a scabbed black ulcer (eschar) with significant surrounding edema. Roughly 5% - 20% of people with untreated cutaneous anthrax die, although prompt treatment with effective antibiotics can substantially reduce the risk of death.

Initial symptoms of anthrax of the lower respiratory tract (inhalation anthrax) are usually mild, resembling an upper respiratory infection. Severe symptoms follow within 3 - 5 days, and include respiratory distress, fever and shock, with death following shortly. X-rays typically show a widened mediastinum. Hemorrhagic mediastinitis and/or meningitis are frequent severe complications. Case-fatality estimates for inhalational anthrax are based on incomplete information, but the rate appears to be extremely high. The case-fatality rate is estimated to be approximately 75%, even with all possible supportive care, including appropriate antibiotics.

Intestinal anthrax is rare and tends to occur in foodborne outbreaks. Fever, vomiting of blood, severe diarrhea, blood infection and death typically follow abdominal pain. Even with treatment, the case-fatality rate for intestinal anthrax can approach 50%.

A form of anthrax affecting the upper throat (oropharyngeal anthrax) has also been described.

C. Reservoirs

Wild and domestic hoofed herbivores (plant-eating animals), including livestock, are the main reservoir for anthrax. The anthrax bacteria are shed in terminal hemorrhages or blood at death. These spores are very resistant to disinfection and adverse environmental conditions, so they are capable of surviving in soil for decades. Skins and hides of infected animals may harbor the spores for years. Worldwide spread of anthrax occurs primarily through dissemination of contaminated skins and hides.

D. Modes of Transmission

Cutaneous infection occurs through: 1) contact with contaminated skins, wool or hides, or products made from these; 2) contact with tissues of animals that are clinically ill or dead from anthrax; 3) contact with soil contaminated with spores or contaminated bonemeal used in gardening; or, 4) rarely, bites by insects that have bitten infected animals or humans.

Inhalation anthrax may occur in environments where animal hides and wool are processed. It may also occur due to accidental or intentional aerosolization of spores, as may occur with a laboratory accident or bioterrorism event.

Intestinal and oropharyngeal anthrax occurs through ingestion of undercooked contaminated meat.

E. Incubation Period

The incubation period for anthrax is usually 1- 7 days, and most cases occur within 2 days of exposure. However, incubation periods of up to 60 days have been reported.

F. Period of Communicability or Infectious Period

Person-to-person transmission has not been documented with inhalation or intestinal anthrax. Person-to-person transmission with cutaneous anthrax rarely occurs. Products and soil contaminated with spores may remain infectious for decades.

G. Epidemiology

Anthrax is primarily a disease of wild and domestic herbivorous (plant-eating) animals. Unaffected herds of livestock may be exposed through feed containing contaminated bonemeal. Anthrax is an infrequent cause of disease in the United States and a sporadic cause of disease in most industrialized countries. Anthrax in animals is common in Central and South America, southern and Eastern Europe, Africa and Asia. Persons at greatest risk of contracting anthrax are those whose occupations may expose them to contaminated meat, hides or wool. Veterinarians and others who handle and treat infected animals are also at risk. In Iowa, anthrax in animals is reported on rare occasions.

H. Bioterrorism Potential

Category A *Bacillus anthracis* is considered a potential bioterrorism agent. If acquired and properly disseminated, *Bacillus anthracis* could cause serious public health harm and would challenge public health in terms of ability to limit the numbers of casualties.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify potential sources of transmission in the United States (*e.g.*, imported wool, livestock, or soil), and to stop transmission from such sources.

- To identify sources of transmission and geographical areas of risk outside the United States and to stop transmission from such sources.
- To identify human and animal cases as early as possible to prevent transmission to other persons or animals, either through direct contact (unlikely) or through spores that form in carcasses of dead animals.
- To identify cases and clusters of human illness that may be associated with a bioterrorist event.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and healthcare provider immediately report any suspicion of anthrax called to your attention by a healthcare provider or any positive laboratory result pertaining to anthrax. (A case with widened mediastinum and/or hemorrhagic mediastinitis with or without presumptive or confirmatory laboratory results is a suspect case.)

The reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736, if calling after business hours, call the Iowa State Patrol Office at (515) 323-4360 and they will page a member of the on-call CADE staff.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) provides services for testing clinical specimens for *B. anthracis* and for confirmation of isolates from sentinel laboratories. Sentinel laboratories can send specimens (blood, tissue biopsies, discharge fluid, vesicle fluid, etc.) to SHL. Isolates submitted from other laboratories will be confirmed and/or identified. Additionally, SHL requests that all laboratories submit all isolates cultured for further identification to aid in the public health surveillance necessary for this illness as rapidly as possible. SHL needs to be contacted before samples are submitted. For more information on submitting samples, contact SHL at (319) 335-4500, or visit: www.shl.uiowa.edu/

C. Local Public Health Agency Follow-up Responsibilities

Case Investigation

- a. The most important thing a LPHA can do upon learning of a suspect or confirmed case of anthrax, or potential exposure to anthrax, if bioterrorism is suspected, is to immediately call IDPH any time at (800) 362-2736.**
- b. Case investigation of anthrax in Iowa residents will be directed by IDPH. If a bioterrorism event is suspected, IDPH and other response authorities will work closely with LPHAs and provide instructions/information on how to proceed.
- c. Following immediate notification of IDPH, the LPHA may be asked to assist in investigating cases that live within their communities, including gathering the following:
 - 1) The case's name, age, address, phone number, status (hospitalized, at home, deceased), and parent/guardian information, if applicable.
 - 2) The name and phone number of the hospital where the case is or was hospitalized.
 - 3) The name and phone number of the case's attending physician.
 - 4) The name and phone number of the infection prevention staff at the hospital.
 - 5) If the patient was seen by a healthcare provider before hospitalization, or seen at more than one hospital, be sure to document these names and phone numbers as well.
- d. Institution of disease control measures is an integral part of case investigation. It is the LPHA responsibility to understand, and, if necessary, institute the control guidelines listed below in Section 3), Controlling Further Spread.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Minimum Period of Isolation of Patient

Until lesions are healed or free of anthrax bacilli.

Minimum Period of Quarantine of Contacts

No restrictions.

B. Protection of Contacts of a Case

There is no immunization or prophylaxis for contacts of cases. Anthrax is essentially non-contagious.

Standard Precautions are recommended for use for healthcare providers when caring for a patient with anthrax. This includes use of gloves and gowns if soiling of clothing is possible and when in contact with any open wound.

In the event of death, it should be assumed that all body fluids of the deceased person have very high concentrations of *B. anthracis*. Gloves and gowns should be worn when placing the body in a body bag. Contaminated dressings and bedclothes of cases should be burned or steam sterilized to destroy spores. The patient room may require fumigation, depending on the perceived level of contamination. Consultation with CADE is recommended in this type of situation.

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected

Even a single case of human anthrax, especially of the inhalation variety, would be so unusual in the United States that it would warrant immediate reporting to public health and law enforcement authorities for consideration of deliberate use.

Note: For a potential bioterrorism event, IDPH and other response authorities will work closely with local agencies and provide instructions/information on how to proceed.

If the threat of exposure to aerosolized anthrax is credible or confirmed, persons at risk should begin post-exposure with both an appropriate antibiotic and vaccine.

D. Preventive Measures

Environmental Measures

Implicated food items must be removed from the environment. A decision about testing implicated food items can be made in consultation with the Department of Inspection and Appeals (DIA) and CADE. Coordination for pickup and testing of food samples can be done through the DIA. If a commercial product is suspected, DIA will also coordinate follow-up with relevant outside agencies.

Personal Preventive Measures/Education

To avoid cases of anthrax, IDPH recommends the following:

- Individuals at significant on-going risk of acquiring anthrax (*e.g.*, laboratory workers) should be vaccinated.
- Employees who work with hides of potentially infected animals should be educated about anthrax and how to minimize exposures and possibly receive vaccine.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for anthrax can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2000 Red Book: Report of the Committee on Infectious Diseases, 25th Edition*. Illinois, American Academy of Pediatrics, 2000.

Heymann, D., ed., *Control of Communicable Diseases Manual, 20th Edition*. Washington, DC, American Public Health Association, 2015.

CDC. Anthrax website: emergency.cdc.gov/agent/anthrax/index.asp#