

Anthrax Investigation Guideline

CONTENT:

VERSION DATE:

Investigation Protocol:

- Investigation Guideline 02/2012
- Anthrax Rapid Assessment Form 02/2010

Supporting Materials (found in attachments):

- Fact Sheet 03/2010
- ACIP Recommendations for Use of Anthrax Vaccine in the United States 07/2010

Revision History:

Date	Replaced	Comments
02/2012	04/2010	BEPHI replaced BSE throughout. Updated web links. Addition of notification section and select agent information.
04/2010	03/2010	Typographical corrections in Investigation Protocol.

Anthrax

Disease Management and Investigation Guidelines

CASE DEFINITION (CDC 2010)

Clinical Description for Public Health Surveillance:

Cutaneous Anthrax: An acute illness, or post-mortem examination revealing a painless skin lesion developing over 2 to 6 days from a papular through a vesicular stage into a depressed black eschar with surrounding edema. Fever, malaise and lymphadenopathy may accompany the lesion.

Inhalation Anthrax: An acute illness, or post-mortem examination revealing a prodrome resembling a viral respiratory illness, followed by hypoxia, dyspnea or acute respiratory distress with resulting cyanosis and shock. Radiological evidence of mediastinal widening or pleural effusion is common.

Gastrointestinal Anthrax: An acute illness, or post-mortem examination revealing severe abdominal pain and tenderness, nausea, vomiting, hematemesis, bloody diarrhea, anorexia, fever, abdominal swelling and septicemia.

Oropharyngeal Anthrax: An acute illness, or post-mortem examination revealing a painless mucosal lesion in the oral cavity or oropharynx, with cervical adenopathy, edema, pharyngitis, fever, and possibly septicemia.

Meningeal Anthrax: An acute illness, or post-mortem examination revealing fever, convulsions, coma, or meningeal signs. Signs of another form will likely be evident as this syndrome is usually secondary to the above syndromes.

Case Classification:

Confirmed: A clinically compatible illness with one of the following:

- Culture and identification of *B. anthracis* from clinical specimens by the Laboratory Response Network (LRN);
- Demonstration of *B. anthracis* antigens in tissues by immunohistochemical staining using both *B. anthracis* cell wall and capsule monoclonal antibodies;
- Evidence of a four-fold rise in antibodies to protective antigen between acute and convalescent sera or a fourfold change in antibodies to protective antigen in paired convalescent sera using Centers for Disease Control and Prevention (CDC) quantitative anti-PA IgG ELISA testing;
- Documented anthrax environmental exposure AND evidence of *B. anthracis* DNA (for example, by LRN-validated polymerase chain reaction) in clinical specimens collected from a normally sterile site (such as blood or CSF) or lesion of other affected tissue (skin, pulmonary, reticuloendothelial, or gastrointestinal).

Probable: A clinically compatible illness that does not meet the confirmed case definition, but with one of the following:

- Epidemiological link to a documented anthrax environmental exposure;
- Evidence of *B. anthracis* DNA (for example, by LRN-validated polymerase chain reaction) in clinical specimens collected from a normally sterile site (such as blood or CSF) or lesion of other affected tissue (skin, pulmonary, reticuloendothelial, or gastrointestinal);
- Positive result of clinical serum specimens with the Quick ELISA Anthrax-PA kit;
- Detection of Lethal Factor (LF) in clinical serum specimens by LF mass spectrometry
- Positive result on testing of culture from clinical specimens with the RedLine Alert test.

Suspected: An illness that is suggestive of one of the known anthrax clinical forms but no definitive, presumptive, or suggestive laboratory evidence of *B. anthracis*, or epidemiologic evidence relating it to anthrax.

LABORATORY ANALYSIS

BEPHI must be contacted at 877-427-7317 before sending in specimens to the Kansas Health and Environment Laboratory (KHEL). KHEL is equipped to test isolates and environmental samples by polymerase chain reaction and culture.

Clinical Specimen Scenario: Private laboratories may identify an organism from a clinical specimen that is reported as a “Bacillus species, unable to rule out Anthrax”. After BEPHI is contacted, the isolates can be forwarded to KHEL for further testing. The local health department (LHD) will be notified.

- Further investigation by the LHD will depend on the medical provider diagnosis and the patient’s symptoms (i.e., previously healthy patient with a rapidly progressive respiratory illness or a cutaneous ulcer).
- Refer to [Managing Special Situations – Rule- out Anthrax...](#)

Environmental Specimen Scenario: Refer to [Managing Special Situations – Intentional Contamination.](#)

Using KHEL for testing after approval has been granted from BEPHI:

- Test method: Culture and PCR
- Specimens: 1) clinical specimens or pure culture isolates from clinical specimens or 2) environmental specimens from approved situations only.
- KHEL Shipping Kit: [Miscellaneous infectious substance \(IDS\) shipping](#)
- For additional information and/or questions concerning isolate collection, sample transport and laboratory kits call (785) 296-1620 or refer to the online resource guide at: www.kdheks.gov/labs/lab_ref_guide.htm

STATPack – another resource from KHEL:

- Allows laboratories to send digital images of suspicious or unknown organisms electronically to a KHEL for consultation.
- Refer to: www.kdheks.gov/labs/lab_preparedness/bioterrorism_statpack.htm

Further information on specimen collection:

- To determine what types of specimens should be collected when evaluating any patient for inhalation, cutaneous, or gastrointestinal *B. anthracis* infection, refer to online CDC guidance at http://emergency.cdc.gov/agent/anthrax/lab-testing/recommended_specimens.asp
- Culturing *B. anthracis* from clinical specimens remains the gold standard.
- In systemic infections, organisms can easily be cultured from the blood, and *B. anthracis* may be cultured from other clinical samples including: skin lesion exudates, pleural fluid, cerebrospinal fluid (CSF), and stool if collected prior to antimicrobial therapy.
- If anthrax is suspected, diagnostic specimens including blood cultures should be obtained prior to starting antimicrobial therapy.

IMPORTANT: Upon verification of *B. anthracis*, the laboratory who handled any specimens or isolates must use appropriate forms to report the identification or verification of the select agent or related toxins and of the final disposition of that identified agent or toxin and the specimens that were presented for diagnosis, verification, or proficiency testing, as well as any seizure of the select agents or toxins by federal law enforcement agencies. Refer to: www.selectagents.gov

EPIDEMIOLOGY

Anthrax is primarily a disease of herbivorous; humans are accidental hosts. In the developed countries, anthrax is infrequent and sporadic, and is primarily an occupational hazard of workers who process hides, wool, hair, bone and bone products imported from endemic regions and of veterinarians and agriculture and wildlife workers who handle infected animals. Human anthrax is endemic in the agricultural regions of the world, such as sub-Saharan Africa and Asia, south and central America, and southern and eastern Europe. Livestock are at risk of infection from animal feed containing contaminated bone meal. Disruption of soil over previous burial sites of infected carcasses may provoke epizootics. Anthrax has been deliberately used to cause harm. Outbreaks and incidents in the U.S. have been associated with spread of spores through the postal system and the import of hides and or products from the hides from endemic countries.

DISEASE OVERVIEW

A. Agent:

Bacillus anthracis, a gram-positive, encapsulated, spore-forming, non motile rod. Specifically, the anthrax spores of *B. anthracis* are the infectious agent.

B. Clinical Description:

There are three main clinical presentations of anthrax:

Cutaneous: The most common clinical presentation. Initial itching at the affected site is followed by a lesion that becomes papular then vesicular, developing in 2-6 days into a depressed black eschar. Moderate to severe edema that is extensive surround the eschar, sometimes with small secondary vesicles. Pain, if present, is usually due to edema or secondary infection. The most common sites of infection are exposed areas of the body (i.e., head, neck, forearms and hands). Complications can include obstructive airway disease with edema of the face and neck. Untreated infections can also spread to regional lymph nodes and bloodstream resulting in septicemia and possible meninges involvement. Case-fatality rate is estimated between 5% and 20%.

Inhalational: Initial symptoms are mild and nonspecific and may include fever, malaise, and mild cough or chest pain; acute symptoms of respiratory distress, including stridor, sever dyspnea, hypoxemia, diaphoresis, shock and cyanosis, and X-ray evidence of mediastinal widening follow in 3-4 days, with death shortly after. Pleural effusion is common, and infiltrates can sometimes be seen on chest X-ray. Upper respiratory symptoms are not usually present. Case fatality rate is estimated to be >85%.

Gastrointestinal: Lesions lie at any point of the intestinal tract and are ulcerative and massively edematous, leading to hemorrhage, obstruction, perforation and extensive ascites. Abdominal distress is characterized by pain, nausea and vomiting followed by fever, signs of septicemia, and death. A rare oropharyngeal form of primary disease is characterized by edematous lesions, necrotic ulcers and swelling in the oropharynx and neck.

All forms of anthrax if untreated can develop into systemic illnesses that include fever, shock, and meningitis that is usually fatal.

C. Reservoirs:

Animals, usually hoofed herbivores. Vegetative *B. anthracis* produces spores on exposure to air. Resistant to disinfection and adverse environmental conditions, the spores may remain viable in contaminated soil for years. Dried and/or processed skins and hides of infected animals may harbor the spores.

D. Mode(s) of Transmission:

Contact with the tissues of any parts of livestock or wild animal dying of the disease, and/or hair, wool, hides or bone material taken for trade and products made from them; possibly also through biting flies that have fed on such animals; or contact with contaminated bone meal. Cutaneous anthrax requires a pre-existing lesion. Gastrointestinal and oropharyngeal anthrax may arise from the ingestion of inadequately cooked meat from infected animals; there is no evidence that milk from infected animals transmits anthrax. Inhalation anthrax results from inhalation of spores in risky industrial processes where spores are generated in enclosed poorly-ventilated area. Cases of both cutaneous and inhalation anthrax have been reported among drum makers. Disease spreads through animals by contaminated soil, feed, and probably biting flies.

E. Incubation Period: Usually 1-7 days, periods up to 60 days are possible.

F. Period of Communicability:

Person-to-person transmission is very rare; only reported for rare cases of cutaneous anthrax via direct contact with lesions. Products and soil contaminated with *B. anthracis* spores may remain infectious for decades.

G. Susceptibility and Resistance:

Circumstantial evidence indicates humans are moderately resistant to anthrax infection. Some evidence exists of inapparent infection among those in frequent contact with the agent. Second attacks can occur but are rare.

H. Treatment

Ciprofloxacin is recommended as first-line treatment. Alternatives are doxycycline and amoxicillin (if isolate is susceptible). Cephalosporins and trimethoprim-sulfamethoxazole should not be used to treat anthrax. Initial intravenous therapy with two or more antimicrobial agents effective against *B. anthracis* is usually recommended for treatment of all forms of anthrax with the exception of uncomplicated cutaneous anthrax in adults. Refer to recommendations at: <http://emergency.cdc.gov/agent/anthrax/treatment>

I. Vaccine:

A cell-free vaccine containing protective antigen (US trade name: Biothrax) is recommended for the following persons who:

- Work directly with the organism in the laboratory;
- Work with imported animal hides or furs in areas where standards are insufficient to prevent exposure to anthrax spores;
- Handle potentially infected animal products in high-incidence area;
- Travel to work with animals in other countries where incidence is higher;
- Military personnel deployed to areas with high risk for exposure.

NOTIFICATION TO PUBLIC HEALTH AUTHORITIES

As a potential bioterrorism agent, all confirmed or ***suspected*** anthrax cases shall be reported within **4 hours by phone**:

1. Health care providers and hospitals: report to the local public health jurisdiction or KDHE-BEPHI (see below)
2. Local public health jurisdiction: report to KDHE-BEPHI (see below)
3. Laboratories: report to KDHE-BEPHI (see below)
4. KDHE-BEPHI will contact the local public health jurisdiction by phone within one hour of receiving any suspected anthrax report.

**Kansas Department of Health and Environment (KDHE)
Bureau of Epidemiology and Public Health Informatics (BEPHI)
Phone: 1-877-427-7317**

Further responsibilities of state and local health departments to the CDC:

As a nationally notifiable condition, anthrax cases require an IMMEDIATE, EXTREMELY URGENT or IMMEDIATE, URGENT report to the Center of Disease Control and Prevention (CDC) depending on the circumstances.

1. An anthrax case whose 1) source of infection is unknown; 2) is recognized as BT exposure/potential mass exposure; or 3) is a serious illness not responding to treatment represents a situation requiring **IMMEDIATE, EXTREMELY URGENT** reporting.
 - KDHE epidemiologist must call the CDC EOC at 770-488-7100 within 4 hours of a being notified of the [confirmed](#) or [probable](#) case.
 - KDHE-BEPHI will notify the **Local public health jurisdiction** immediately to coordinate on follow-up for the report information needed to complete the electronic form before the next business day.
 - KDHE-BEPHI will file an electronic case report the next business day.
2. An anthrax case that is naturally-occurring or occupational and is responding to treatment requires IMMEDIATE, URGENT reporting.
 - KDHE epidemiologist to call the CDC EOC at 770-488-7100 within 24 hours of a case meeting the [confirmed](#) or [probable](#) criteria.
 - **Local public health jurisdiction** will report information requested on the disease reporting forms as soon as possible, completing the forms within 7 days of receiving a notification of an anthrax report.
 - KDHE-BEPHI will file an electronic case report the next regularly scheduled electronic transmission.
(KDHE-BEPHI files electronic reports weekly with CDC.)

INVESTIGATOR RESPONSIBILITIES

- 1) Use current [case definition](#), to confirm diagnosis with the medical provider.
- 2) Conduct a [case investigation](#) to identify potential source of infection.
- 3) Conduct [contact investigation](#) to identify additional cases.
- 4) Identify whether the source of infection is major public health concern.
 - Source is unknown, or bioterrorism or mass exposure is indicated
 - Serious illness not responding to treatment
- 5) Initiate control and prevention measures to prevent spread of disease.
- 6) Complete and report all information requested in the Kansas electronic surveillance system.
- 7) As appropriate, use the disease [fact sheet](#) to educate individuals or groups.

STANDARD CASE INVESTIGATION AND CONTROL METHODS

The [Anthrax Rapid Assessment Worksheet](#) can help to collect data.

Case Investigation

- 1) Contact the medical provider who ordered testing of the case or is attending to the case and obtain the following information. (This includes medical records for hospitalized patients.)
 - Using the [Rapid Assessment Form](#), identify any symptoms of anthrax:
 - Record earliest onset date, noting the first symptom.
 - Record any other symptoms experienced.
 - Examine the laboratory testing that was done to ensure all testing that could confirm the case has been reported in state surveillance system.
 - Examine and record the therapy that the case received.
 - Collect case's demographic data and contact information (birth date, county, sex, race/ethnicity, occupation, address, phone number(s))
 - Record hospitalizations: location, admission and discharge dates
 - Record outcomes: recovered or date of death
- 2) Interview the case or proxy to determine source and risk factors; focus on a 6 week incubation period prior to illness onset.
 - Patient's occupation; note specific job duties, industry type and location.
 - At risk occupations could include farmers, dairyman, veterinarian, wool processor, weaver, butcher, slaughterhouse employee, tanner, taxidermist, hunter, or laboratory worker.
 - Travel to out of the county during incubation period.
 - Contact with animals and/or animal products, especially imported items.
 - Ingestion of undercooked meat.
 - If no other risk factors are identified, start to consider [intentional contamination or bioterrorism situations](#).
- 3) Investigate epi-links among cases (clusters, household, co-workers, etc).
 - For suspected [outbreaks](#) to Managing Special Situations section.

Contact Investigation

- 1) Any person in contact with the source of infection is defined as a contact. This may include physical contact with an infected animal or a contaminated product, ingestion of contaminated food, or inhalation of aerosolized spores.
 - Any exposure that results in a suspected case of anthrax requires a public health investigation to identify if other exposures in the same setting might have led to other cases of anthrax.
- 2) Examine all potential exposures based on the possible source and potential modes of transmission to define who may be at-risk.
- 3) Identify those who participated in at-risk activities and contact them to identify if they are experiencing any symptoms. Refer to [Contact Management](#).
- 4) Investigate the clinical laboratory that handled the *B. anthracis isolate* to ensure standard procedures were in place to minimize the risk of transmission.

Isolation, Work and Daycare Restrictions

- 1) Hospitals: Standard precautions (contact precautions for wound care); no isolation required.
- 2) No restrictions are indicated for outpatient management. Home care providers should be informed of standard precautions (i.e., proper wound care).

Case Management

Report on any changes in patient status (i.e., discharge, death).

Contact Management

- 1) Symptomatic acquaintances, household members, associates, or co-workers should be strongly urged to contact their physician for a medical evaluation and are followed-up as suspect cases.
- 2) Contact Monitoring:
 - Depending on type of exposure, asymptomatic persons who were potentially exposed should continue to monitor themselves for:
 - Any flu-like illness throughout a 60-day period or
 - For new skin lesions/GI symptoms throughout a 14- day period following exposure.
 - A medical provider should be consulted immediately if symptoms develop.
- 3) Laboratory Testing of Contacts:
 - Nasal swabs and serology may be used as epidemiologic tools but **UfYbch** appropriate for medical surveillance of potentially exposed individual workers.
- 4) Exposure circumstances direct decisions on prophylaxis, not the test results.
 - Prophylaxes recommended for unvaccinated persons **at risk for inhalation anthrax** based on possible exposure to aerosolized spores, whether naturally occurring, occupationally related, or intentional
 - Prophylaxis is not indicated for the prevention of cutaneous anthrax, for hospital personnel caring for patients with anthrax, or for persons who routinely open or handle mail if there has not been a credible threat.

- 5) Recommended prophylaxis for unvaccinated contacts includes 60 days of selected oral antibiotics in conjunction with a 3-dose regimen (0, 2 weeks, 4 weeks) of anthrax vaccine (BioThrax, formerly known as AVA).
 - The recommended antibiotic is ciprofloxacin or doxycycline. As soon as the organism is determined to be penicillin sensitive, amoxicillin can be used to finish the 60-day course in children.
 - Tetracycline and fluoroquinolone could be used but may have adverse effects. The risks for these adverse effects must be weighed carefully against the risk for developing life-threatening disease.
 - **Do not** use cephalosporins or trimethoprim/sulfamethoxazole.
 - Refer to [Anthrax as a Biological Weapon, 2002](#) (JAMA, 2002) for additional guidance on prophylaxis; specifically [Table 4](#).
 - Vaccine will be administered under an Investigational New Drug (IND) or potentially under an emergency use authorization (EUA).
- 6) For further recommendations, refer to the [ACIP Recommendation for Use of Anthrax Vaccine in the United States](#).
 - This resource also contains recommendations for pre-event vaccination and post-exposure prophylaxis involving occupational exposures and vaccinated contacts.
- 7) Recommendations may change with additional CDC guidance.

Environmental Measures

- 1) Animal or meat product as sources of infection:
 - Verify the location, or previous location, of the source of infection (i.e., state or country of origin of meat or animal product).
 - Implicated food items must be removed from the environment. If a commercial food item is implicated, the Kansas Department of Agriculture should be notified immediately (785-296-5600).
 - If any domestic animal or animals that reside in the state of Kansas is affected by anthrax, the Kansas Animal Health Department should be notified immediately (785-296-2326).
 - Importation of animal products is regulated by the United States Department of Agriculture (USDA). KDHE Epidemiological Services will assist with coordination with the USDA.
- 2) In laboratories, a 10% bleach solution is routinely used to decontaminate surfaces.
- 3) Building decontamination of weaponized *B. anthrax*, requires expert advice.

Education

- 1) Use fact sheets and materials from CDC (www.bt.cdc.gov/agent/anthrax/) to educate individuals and groups.
- 2) Educate workers who handle potentially contaminated articles about the modes of anthrax transmission and disease prevention methods, including care of skin abrasions, general hygiene and other personal protective measures

MANAGING SPECIAL SITUATIONS

A. Outbreak Investigation:

A single case of inhalation anthrax is so unusual that it should be reported and investigated immediately as a potential bioterrorist event. Two or more cases of cutaneous or gastrointestinal anthrax with a common source or suspected common source should be investigated as an outbreak with adequate resources applied to the investigation.

- 1) Consider the possibility of an outbreak when there is an unusual clustering of cases in time and/or space
- 2) Notify KDHE immediately, 1-877-427-7317.
- 3) Active case finding will be an important part of any investigation.
- 4) All epidemiologic data will be reported and managed through the Kansas outbreak module of the electronic surveillance system.

B. Intentional Contamination

Anthrax is a potential bioterrorism weapon; inhalation of aerosolized spores is of the highest concern. A single case of inhalation anthrax is so unusual that it should be reported and investigated immediately as a potential bioterrorist event. Other forms of anthrax whose case has no remarkable travel history and is not employed in an occupation that is prone to exposure, should result in an intentional event being considered. Because the laboratory confirmation could be delayed, specific epidemiological, clinical, and microbiological findings that suggest an intentional release of anthrax should result in the issue of a health alert and the proper notifications.

If a bioterrorism event is suspected:

- 1) Notify local law enforcement, the local Health Officer, the on-call epidemiologist (local) and KDHE (1-877-427-7317) immediately.
- 2) Implement "[Chain of Custody](#)" procedures for all samples collected, as they will be considered evidence in a criminal investigation.
- 3) Work to define population at risk which is essential to guide response activities. Public health authorities will play the lead role in this effort, but must consult with law enforcement, emergency response and other professionals in the process. The definition may have to be re-evaluated and redefined at various steps in the investigation and response.
- 4) Once the mechanism and scope of delivery has been defined, identify symptomatic and asymptomatic individuals among the exposed and recommend treatment and/or chemoprophylaxis.
- 5) Establish and maintain a detailed line listing of all cases and contacts with accurate identifying and locating information.

For 'White-powder' / Suspicious Substance:

- 1) Local law enforcement will assess whether a "credible threat" exists.
- 2) If a credible threat does not exist, no public health response is necessary. Local law enforcement will continue with their investigation, as needed.
- 3) If a credible threat exists, the area will be secured:
 - Local public health and local emergency management will be notified.
 - The nearest HAZMAT team will be called to assess the situation and to

- perform preliminary testing.
 - Specimen collection will occur with chain of custody maintained.
- 4) Local public health response for a credible threat:
- Call KDHE via Epi-hotline at 877-427-7317 to obtain approval for testing at state laboratory (KHEL) and to relay information on (or obtain assistance with) specimen transportation and delivery
 - Work with law enforcement to collect listing of those potential exposed.
 - Review [safety considerations](#) and [risk communication materials](#).
 - Immediately after the event and as directed in [surveillance](#) section, interview those potentially exposed collecting information on:
 - Contact's specific location/activities during the event
 - Symptoms or ailments
 - Medical care and clinical status
 - Any treatment and/or prophylaxis
 - If needed, provide and ensure adequate prophylaxis to those exposed.
- 5) If the KHEL obtains a positive result:
- KHEL will immediately notify the local FBI Field Office of result.
 - Local FBI will make local notifications and notify the FBI Headquarters.
 - FBI headquarters will convene an initial conference call with local FBI, Health and Human Services (HHS) and KDHE to review the results, assess the preliminary information, and arrange for additional testing.
 - FBI Headquarters will notify Department of Homeland Security.
 - Specimens or isolates may be sent to CDC or other laboratories.
 - HHS will provide guidance on protective measures such as prophylactic treatment and continued facility operation.

Safety Considerations:

- Anthrax is not transmitted person-to-person.
- Greatest risk to human health occurs during the period of primary aerosolization in which anthrax spores remain airborne.
- Response personnel are not likely to be at risk during the investigation. A possible exception would be a mechanism designed to disseminate spores into an enclosed space over an extended period of time.
- Decontamination: Rarely necessary. Any person coming in direct physical contact with a substance alleged to be anthrax should thoroughly wash exposed skin and/or hair with soap and water. Articles of clothing should be placed in a plastic bag, sealed, and labeled with the person's name and contacting information.
- For additional information on worker safety, refer to CDC guidance at: www.bt.cdc.gov/agent/anthrax/work-safety/

Risk Communication Materials:

- Factsheet for anthrax, including non-English Speakers:
 - Located in KDHE [Public Information and Communication Standard Operating Guide](#), Supporting Document F – Public Information, Biological Hazards.
- Communicating in the First Hours: www.bt.cdc.gov/firsthours/anthrax/

Surveillance:

- Arrange for active surveillance for 60 days for the development of signs and symptoms of anthrax among all individuals exposed.

Diagnosis of Inhalational Anthrax Infection:

- Diagnostic test findings: widened mediastinum, infiltrates, pleural effusion on chest radiograph; hyperdense hilar and mediastinal nodes, mediastinal edema, infiltrates, pleural effusion on chest computed tomographic scan; and hemorrhagic pleural effusions on thoracentesis
- Microbiological findings: Peripheral bloods smear with gram-positive bacilli or blood culture growth of large gram-positive bacilli with preliminary identification of *Bacillus sp.* Other rapid assays may also be available.
- Pathological findings: hemorrhagic mediastinitis, hemorrhagic thoracic lymphadenitis, hemorrhagic meningitis; or DFA stain of infected tissues

Treatment:

- Drug-resistant organisms might be used as a weapon, conduct antimicrobial susceptibility testing quickly and alter treatments as needed.
- Antibiotics for treating patients infected with anthrax in a bioterrorist event are included in the national pharmaceutical stockpile maintained by CDC, as are ventilators and other emergency equipment.
- 2001 Guidelines on antimicrobial therapy from CDC ([Table 1](#) and [2](#)) are available on-line: www.cdc.gov/mmwr/preview/mmwrhtml/mm5042a1.htm

Postexposure prophylaxis (PEP):

- Guidelines for which populations would require post-exposure prophylaxis to prevent inhalational anthrax following the release of a *B. anthracis* aerosol as a biological weapon be developed by public health officials and depend on epidemiological circumstances. These decisions would require estimates of the timing, location, and conditions of the exposure.
- Pharmaceuticals: In the event of an outbreak of anthrax, adequate quantities of appropriate antibiotics will be procured from the Strategic National Stockpile. Procurement, storage, and distribution will be coordinated through the Kansas Department of Health and Environment. Local and state public health officials must play a central role in determining which individuals should have priority for receipt of limited pharmaceuticals.
- PEP of close contacts of anthrax patients is not recommended because person-to-person transmission is not known to occur.

Additional guidance from the CDC will be utilized as needed; including [Interim Guidelines for Investigation of & Response to Bacillus anthracis Exposures](#) and [ACIP Recommendations for Use of Anthrax Vaccine in the United States](#).

TABLE 1. Inhalational anthrax treatment protocol*.[†] for cases associated with this bioterrorism attack

Category	Initial therapy (intravenous) ^{§1}	Duration
Adults	Ciprofloxacin 400 mg every 12 hrs* or Doxycycline 100 mg every 12 hrs ^{††} and One or two additional antimicrobials [‡]	IV treatment initially ^{**} . Switch to oral antimicrobial therapy when clinically appropriate: Ciprofloxacin 500 mg po BID or Doxycycline 100 mg po BID Continue for 60 days (IV and po combined) ^{§§}
Children	Ciprofloxacin 10–15 mg/kg every 12hrs ^{¶•***} or Doxycycline: ^{††††} >8 yrs and >45 kg: 100 mg every 12 hrs >8 yrs and ≤45 kg: 2.2 mg/kg every 12 hrs ≤8 yrs: 2.2 mg/kg every 12 hrs and One or two additional antimicrobials [‡]	IV treatment initially ^{**} . Switch to oral antimicrobial therapy when clinically appropriate: Ciprofloxacin 10–15 mg/kg po every 12 hrs ^{***} or Doxycycline: ^{†††} >8 yrs and >45 kg: 100 mg po BID >8 yrs and ≤45 kg: 2.2 mg/kg po BID ≤8 yrs: 2.2 mg/kg po BID Continue for 60 days (IV and po combined) ^{§§}
Pregnant women ^{§§§}	Same for nonpregnant adults (the high death rate from the infection outweighs the risk posed by the antimicrobial agent)	IV treatment initially. Switch to oral antimicrobial therapy when clinically appropriate. [†] Oral therapy regimens same for nonpregnant adults
Immunocompromised persons	Same for nonimmunocompromised persons and children	Same for nonimmunocompromised persons and children

* For gastrointestinal and oropharyngeal anthrax, use regimens recommended for inhalational anthrax.
[†] Ciprofloxacin or doxycycline should be considered an essential part of first-line therapy for inhalational anthrax.
[‡] Steroids may be considered as an adjunct therapy for patients with severe edema and for meningitis based on experience with bacterial meningitis of other etiologies.
[§] Other agents with *in vitro* activity include rifampin, vancomycin, penicillin, ampicillin, chloramphenicol, imipenem, clindamycin, and clarithromycin. Because of concerns of constitutive and inducible beta-lactamases in *Bacillus anthracis*, penicillin and ampicillin should not be used alone. Consultation with an infectious disease specialist is advised.
^{**} Initial therapy may be altered based on clinical course of the patient; one or two antimicrobial agents (e.g., ciprofloxacin or doxycycline) may be adequate as the patient improves.
^{††} If meningitis is suspected, doxycycline may be less optimal because of poor central nervous system penetration.
^{§§} Because of the potential persistence of spores after an aerosol exposure, antimicrobial therapy should be continued for 60 days.
^{¶¶} If intravenous ciprofloxacin is not available, oral ciprofloxacin may be acceptable because it is rapidly and well absorbed from the gastrointestinal tract with no substantial loss by first-pass metabolism. Maximum serum concentrations are attained 1–2 hours after oral dosing but may not be achieved if vomiting or ileus are present.
^{***} In children, ciprofloxacin dosage should not exceed 1 g/day.
^{††††} The American Academy of Pediatrics recommends treatment of young children with tetracyclines for serious infections (e.g., Rocky Mountain spotted fever).
^{§§§} Although tetracyclines are not recommended during pregnancy, their use may be indicated for life-threatening illness. Adverse effects on developing teeth and bones are dose related; therefore, doxycycline might be used for a short time (7–14 days) before 6 months of gestation.

TABLE 2. Cutaneous anthrax treatment protocol* for cases associated with this bioterrorism attack

Category	Initial therapy (oral) [†]	Duration
Adults*	Ciprofloxacin 500 mg BID or Doxycycline 100 mg BID	60 days [‡]
Children*	Ciprofloxacin 10–15 mg/kg every 12 hrs (not to exceed 1 g/day) [†] or Doxycycline: [§] >8 yrs and >45 kg: 100 mg every 12 hrs >8 yrs and ≤45 kg: 2.2 mg/kg every 12 hrs ≤8 yrs: 2.2 mg/kg every 12 hrs	60 days [‡]
Pregnant women***	Ciprofloxacin 500 mg BID or Doxycycline 100 mg BID	60 days [‡]
Immunocompromised persons*	Same for nonimmunocompromised persons and children	60 days [‡]

* Cutaneous anthrax with signs of systemic involvement, extensive edema, or lesions on the head or neck require intravenous therapy, and a multidrug approach is recommended. Table 1.

[†] Ciprofloxacin or doxycycline should be considered first-line therapy. Amoxicillin 500 mg po TID for adults or 80 mg/kg/day divided every 8 hours for children is an option for completion of therapy after clinical improvement. Oral amoxicillin dose is based on the need to achieve appropriate minimum inhibitory concentration levels.

[‡] Previous guidelines have suggested treating cutaneous anthrax for 7–10 days, but 60 days is recommended in the setting of this attack, given the likelihood of exposure to aerosolized *B. anthracis* (6).

[§] The American Academy of Pediatrics recommends treatment of young children with tetracyclines for serious infections (e.g., Rocky Mountain spotted fever).

*** Although tetracyclines or ciprofloxacin are not recommended during pregnancy, their use may be indicated for life-threatening illness. Adverse effects on developing teeth and bones are dose related; therefore, doxycycline might be used for a short time (7–14 days) before 6 months of gestation.

C. ‘Rule-out’ Anthrax *Bacillus species* Sent to State Laboratory:

Bacillus species are common in the environment and are part of the normal skin flora. A “rule out anthrax” situation is not urgent, but warrants minimal investigation

- 1) BEPHI must approve the specimen before sending it to the KHEL.
- 2) KHEL must be notified of any approved specimen being sent in for testing.
- 3) BEPHI will notify the LHD of any approved specimens being tested.
- 4) The LHD should contact the patient’s physician to identify if there was any reason to believe that the patient might be experiencing anthrax. The LHD should explain, as necessary, that it is routine for isolates of *Bacillus sp.* that cannot be further identified to undergo testing for anthrax.
- 5) Significant findings obtained from the physician suggesting anthrax should be immediately communicated by phone to BEPHI (877-427-7317).
- 6) Preliminary laboratory testing at the KHEL can take up to 24 hours to complete. If any tests are positive or inconclusive, BEPHI, LHD and CDC will be notified. KDHE will ensure that any additional notification to state and federal level emergency management and law enforcement officials is completed.
- 7) Any significant findings, including positive or inconclusive laboratory testing, will result in further epidemiological investigation in conjunction with BEPHI.

DATA MANAGEMENT AND REPORTING TO THE KDHE

- A. Organize, collect and report data with the Anthrax Rapid Assessment Worksheet and Kansas Notifiable Disease Form (for collection of demographics).
- B. Report data via the state electronic surveillance system.
 - Especially data that collected during the investigation that helps to confirm or classify a case. (For epi-linked cases, please include the Record Number of the related case.)

ADDITIONAL INFORMATION / REFERENCES

- A. **Treatment / Differential Diagnosis:** Red Book: 2009 Report of the Committee on Infectious Diseases. 28th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2009:211-214.
- B. **Epidemiology, Investigation and Control:** Heymann. D., ed., Control of Communicable Diseases Manual, 19th Edition. Washington, DC, American Public Health Association, 2009.
- C. **Case Definitions:** CDC Division of Public Health Surveillance and Informatics, Available at: www.cdc.gov/osels/ph_surveillance/nndss/casedef/case_definitions.htm
- D. **Intentional Biological Event:** Kansas Biological Incident Annex at: www.kdheks.gov/cphp/operating_guides.htm
- E. **Chain of Custody:** KDHE Chain of Custody Standard Operating Guide, www.kdheks.gov/cphp/operating_guides.htm#coc
- F. **Medical Management:**
 - Anthrax as a Biological Weapon, 2002 Updated Recommendations for Management (JAMA): <http://jama.ama-assn.org/cgi/content/full/287/17/2236>
 - USAMRIID's Medical Management of Biological Casualties Handbook (Blue Book): www.usamriid.army.mil/education/instruct.cfm
- G. **Specific guidance from CDC:**
 - Interim Guidelines for Investigation of & Response to *B. anthracis* Exposures: www.cdc.gov/mmwr/preview/mmwrhtml/mm5044a6.htm
 - Update: Investigation of Bioterrorism-Related Anthrax and Interim Guidelines for Exposure Management and Antimicrobial Therapy, October 2001: www.cdc.gov/mmwr/preview/mmwrhtml/mm5042a1.htm
 - ACIP Recommendations for Use of Anthrax Vaccine in the United States: www.cdc.gov/mmwr/preview/mmwrhtml/rr5906a1.htm?s_cid=rr5906a1_w
- H. **Additional Information (CDC):** www.bt.cdc.gov/agent/anthrax/

Anthrax Rapid Assessment Worksheet

(Please refer to the Disease investigation Guideline for additional guidance.)

Patient Name: _____ **DOB:** ___/___/___ **KS-EDSS ID:** _____

Date of Onset: ___/___/___ First Symptom experienced: _____

Status: Hospitalized; Location: _____ Admit: ___/___/___ Discharge: ___/___/___

Died; date of death: ___/___/___

Other; describe: _____

Symptom Information

Symptoms	Yes	No	Unk.	Comments / Specifics
Fever				Max. temp: _____
Headache				
Malaise, severe				
Myalgia				
Stiff Neck				
Abdominal Pain				
Nausea				
Vomiting				
Diarrhea				
Eschar				Location: _____
Edema (swelling)				Location: _____
Lymphadenopathy				Location: _____
Other Skin lesions / Rashes				Describe: _____
Abnormal chest x-ray				Describe: _____
Breathing difficult (Shortness of Breath)				
Cough unproductive				
Upper respiratory symptoms				
Other symptoms (list): _____				

Initial Laboratory Testing

Test Type	Specimen	Collection Date	Laboratory	Obtain Copy of Results
				If not previously reported, fax copies of any results to 877-427-7318.

Notes on Approved Specimen Testing at KHEL:

1. Contact at KHEL: _____ Date: ___/___/___ Time: _____

2. Additional Contacts:

_____ Phone _____

_____ Phone _____

3. Details on specimen being sent (i.e., type, where, when, how):

Anthrax Rapid Assessment Worksheet

(Please refer to the Disease investigation Guideline for additional guidance.)

Initial Information to Collect (Activities 6 weeks before onset)

Initial questions	Yes	No	Unk.	If yes, describe
1. Is any information available on the patient's occupation?				(Exact duties, type of business/industry and location)
2. Does the patient work with or around livestock?				
3. Has the patient had any contact with animal skins, furs, hair, or bone products?				
4. Has the patient traveled outside of the county within the last 6 weeks?				If yes, document travel history.
5. Prior military service?				If yes, date of release __/__/__; last duty location:
6. For GI symptoms, has the patient eaten any undercooked meat?				
7. If no additional risk factors are identified, review patient activities the past 6 weeks. Has the patient: <ul style="list-style-type: none"> a. Attended large gathers or special events? b. Received unusual letters or packages? c. Had contact with unusual powders, dusts or aerosols? d. Opened mail for others? e. Visited or had recent contact with a person who works at a major media outlet? f. Had recent contact or visited an elected official or government office? 				
8. Have any household members or close contacts experienced similar symptoms recently?				If yes, use general investigation contact form for documentation.

Additional Comments/Notes (i.e., Notifications, Contact information, Pending actions):

Supporting Materials

Supporting Materials are available under attachments:

CLICK HERE TO VIEW ATTACHMENTS

Then double click on the document to open.

Other Options to view attachments:

Go to <View>; <Navigation Pane>; <Attachments>

– OR –

Click on the “Paper Clip” icon on the left.