



ANTHRAX

1. **Agent:** *Bacillus anthracis*, a Gram-positive spore-forming bacillus.

2. **Identification:**

a. **Symptoms:**

Cutaneous anthrax: An initial vesicle at site of inoculation develops into a painless black eschar. Progresses to systemic anthrax in 10-20% of cases; systemic anthrax, if untreated, has a fatality rate up to 20%. Fatalities for cutaneous anthrax are <1% if effective antibiotics are given.

Inhalational anthrax: Initially fever, chills, sweats, malaise, mild cough, dyspnea, nausea, or vomiting followed 3-5 days later by acute onset of respiratory distress, shock; radiologic evidence of mediastinal widening and pleural effusion. Fatality rate is extremely high.

Anthrax meningitis: hypotension, delirium or coma follow quickly; refractory seizures, cranial nerve palsies, and myoclonus have been reported. Can develop hemorrhagic meningitis with cerebrospinal fluid analysis showing elevated protein, low glucose, and a positive Gram stain and culture. Seventy-five percent of patients died within 24 hours of presentation.

Gastrointestinal (GI) anthrax: Acute vomiting, abdominal distention, GI bleeding, peritonitis; fatality rate high.

b. **Differential Diagnosis:** Cutaneous anthrax- includes spider bite, Orf, ulceroglandular tularemia, scrub typhus, ecthyma gangrenosum, cutaneous leishmaniasis rickettsialpox. Inhalational anthrax- includes pneumonic plague, tularemia, community acquired pneumonia, viral pneumonias, Q fever.

c. **Diagnosis:** Demonstration of *B. anthracis* by smear, animal inoculation or culture or PCR from blood, CSF, pleural fluid, ascitic fluid, vesicular fluid, or lesion exudate. Serologic test for *B. anthracis* toxin. Histopathology from fresh or frozen tissue.

3. **Incubation:** Within 7 days, usually 2 to 5.

4. **Reservoir:** Soil; infected animals (cattle, sheep, goats, horses, pigs, etc.).

5. **Source:** Spores from soil or contaminated animal products (hides, hair, meat, bones).

6. **Transmission:** Inoculation, inhalation of spores, or ingestion of undercooked, contaminated meat.

7. **Communicability:** Inhalational Anthrax: No evidence of transmission from person to person. Contaminated products and soil remain infective for years. Cutaneous Anthrax: Transmission through non-intact skin contact with draining lesions possible, therefore use Contact Precautions if large amount of uncontained drainage. Handwashing with soap and water preferable to use of waterless alcohol based antiseptics since alcohol does not have sporicidal activity. Environmental: Aerosolizable spore-containing powder or other substance: Until decontamination of environment complete, wear respirator (N95 mask or PAPRs), protective clothing; decontaminate persons.

8. **Specific Treatment:**

Cutaneous anthrax: ciprofloxacin or doxycycline.

Inhalation or gastrointestinal anthrax: ciprofloxacin or doxycycline in combination with one or two other active drugs. Penicillin or amoxicillin may be used if strain is susceptible.

9. **Immunity:** Uncertain.

REPORTING PROCEDURES

1. **Report any case or suspect cases by telephone immediately** (Title 17, Section 2500. *California Code of Regulations*).

a. Call Morbidity Unit during working hours.

b. Call ACDC; after working hours, contact Administrative Officer of the Day (AOD) through County Operator.



- c. Any laboratory that receives a specimen for anthrax testing is required to report to the State Microbial Diseases Laboratory immediately (Title 17, Section 2505, *California Code of Regulations*).
 - d. ACDC must notify the State Division of Communicable Disease Control (DCDC) immediately upon receiving notice of a case of suspected anthrax. ACDC will supervise investigation and control measures.
2. **Report Form:** [ANTHRAX HUMAN CASE REPORT \(CDPH 8578\)](#)
 3. **Epidemiologic Data:**
 - a. Specify type (cutaneous, inhalational, or gastrointestinal).
 - b. **Occupation:** Farmer, dairyman, veterinarian, wool processor, weaver, butcher, slaughterhouse employee, tanner, taxidermist, hunter, or laboratory worker. Also postal workers, politicians and their staff, and members of news media as in the 2001 anthrax letter attacks.
 - c. Contact with animals or animal products. Determine if veterinary diagnosis was made.
 - d. Ingestion of undercooked meat.
 - e. Exposure to animal products (e.g., hair, skins, paint brushes, bongo drums, leather, and wool) imported from outside the USA, especially Haiti and Asia.
 - f. **Bioterrorism:** *B. anthracis* has been listed by the CDC as one of the agents most likely to be used in a bioterrorist attack because of the devastating physical and psychological effects of inhalational anthrax and the ability to be weaponized and effectively delivered to a target area. Please see State of California Bioterrorism Surveillance and Epidemiological Response Plan.

CONTROL OF CASE, CONTACTS & CARRIERS

Notify ACDC immediately and open promptly for ACDC review. ACDC will investigate to identify

potential association to bioterrorist activity. If deemed to be unaffiliated with bioterrorism, the responsibility for the control of cases, contacts and carriers will be returned to the district where upon action should be initiated within 7 days.

CASE:

Precautions:

1. **Cutaneous:** Wound and skin precautions until lesions are completely healed.
2. **Inhalational:** Standard precautions as in Title 17, Section 2500, *California Code of Regulations*. Section 2518 is recommended until patient recovers.

CONTACTS: No restrictions.

CARRIER: Not applicable.

ANIMAL: Veterinary Public Health will investigate potential animal sources.

PREVENTION-EDUCATION

1. Disinfect animal products prior to processing.
2. Educate workers in high-risk occupations.
3. Double-bag discharges from lesions and soiled articles. Autoclave or burn all infectious material.
4. If anthrax is suspected, necropsy must not be done on the animal.
5. Infected animal carcasses should be burned or deeply buried and covered with calcium oxide (CaO, quicklime).
6. Maintain proper ventilation in high-risk industries.
7. Ensure proper disposal of wastes from rendering plants and factories that process potentially contaminated animal products.
8. A vaccine is available for veterinary and other high-risk occupations.
9. Any possible bioterrorist exposures should be reported immediately to local law enforcement and public health for evaluation.



DIAGNOSTIC PROCEDURES

Specimens: Blood, CSF, pleural fluid, ascitic fluid, vesicular fluid, lesion exudates or other materials for direct examination or culture. Consult the Public Health Laboratory.