

## INHALATIONAL ANTHRAX

### Background:

Causative organism is *Bacillus anthracis*, an encapsulated, aerobic, gram-positive spore-forming rod-shaped bacterium. Humans become infected by inhalation of spores from infected animals (e.g., sheep, goats or cattle), animal products, such as hides or hair, or intentional, malicious acts of bioterrorism. All suspected or confirmed cases of anthrax must be reported to the local department of public health and the Illinois Department of Public Health (IDPH).

### Incubation Period:

Usually 1 to 7 days after germination of spores. Germination may be prolonged for up to two months.

### Signs/Symptoms:

A biphasic pattern is described, but symptoms may progress rapidly.

#### First Phase

- 1) Non-specific viral-like symptoms such as low-grade fever, nonproductive cough, malaise, fatigue, myalgias, diaphoresis and chest discomfort 🐼 (*poor feeding/suck for pediatrics*)
- 2) Physical exam may reveal rhonchi, otherwise it is unremarkable
- 3) There may be a period of 1 to 3 days of apparent improvement after onset of initial symptoms

#### Second Phase

- 1) 1 to 5 days after onset of initial symptoms, there will be an abrupt onset of high fever and respiratory distress (dyspnea, stridor, cyanosis)
- 2) Shock and death within 24 to 36 hours after onset of second phase of illness
- 3) The case-fatality rate is estimated to be between 45 percent and 100 percent.

### Laboratory and Diagnostic Testing:

Call the local department of public health and IDPH to inform the state of a possible anthrax case and to obtain additional instructions as necessary.

- 1) Blood: gram-positive bacilli on unspun blood smear
- 2) Blood culture: aerobic growth of gram-positive bacilli
- 3) CSF: obtain if patient has meningeal signs. Gram-positive bacilli may be seen on gram stain of unspun fluid.
- 4) CT Scan: Hyperdense mediastinal (may be hemorrhagic) and hilar lymph nodes, mediastinal edema, peribronchial thickening, and pleural effusions may be seen. The pleural effusions typically increase during hospitalization.
- 5) CXR: widened mediastinum and pleural effusions may be present. Infiltrates are rarely seen.

### Treatment: Contained incident

Standard isolation from contact with skin lesions.

(see tables, next page)

**Table 1:**

Category	Initial Therapy (Oral)	Duration
Adults (including pregnant women and pregnant adolescents)	Ciprofloxacin 400 mg IV every 12 hrs <b>or</b> Doxycycline 100 mg IV every 12 hrs <b>and</b> One or two additional antimicrobials*	IV treatment initially, switch to PO when clinically appropriate (see Table 1 for PO dosing). Treat for a total of 60 days (IV & PO combined).
Children	Ciprofloxacin 10-15 mg/kg every 12 hrs (not to exceed 1 g/day) <b>or</b> Doxycycline: >8 yrs and >45 kg: 100 mg every 12 hrs <b>and</b> One or two additional antimicrobials* All other children: 2.2 mg/kg every 12 hrs <b>and</b> One or two additional antimicrobials*	IV treatment initially, switch to PO when clinically appropriate (see Table 1 for PO dosing). Treat for a total of 60 days (IV & PO combined).
Immunocompromised individuals	Same for non-immunocompromised adults and children	Same for non-immunocompromised adults and children

\*Additional antimicrobials include rifampin, vancomycin, penicillin, ampicillin, chloramphenicol, imipenem, clindamycin and clarithromycin.

**Treatment: Mass casualty incident**

**Table 2:**

Prophylaxis of inhalational anthrax exposure in patients **without** systemic signs or symptoms.

Category	Initial Therapy (Oral)	Duration
Adults (including pregnant women and pregnant adolescents)	Ciprofloxacin 500 mg BID <b>or</b> Doxycycline 100 mg BID	60 days*
Children	Ciprofloxacin 10-15 mg/kg every 12 hrs (not to exceed 1 g/day) <b>or</b> Doxycycline: >8 yrs and >45 kg: 100 mg every 12 hrs All other children: 2.2 mg/kg every 12 hrs	60 days*
Immunocompromised individuals	Same for non-immunocompromised adults and children	60 days*

**Alternative Therapy if Strain is Susceptible**

Adults	Amoxicillin 500 mg PO every 8 hrs
Children	Amoxicillin ≥ 80 mg/kg/day PO, divided, every 8 hrs, not to exceed 500 mg per dose.
Pregnant women and adolescents	Amoxicillin 500 mg PO every 8 hrs
Immunocompromised individual	Same as for non-immunocompromised individuals

\*Previous treatment guidelines for inhalational anthrax suggested 7 to 10 days of therapy; however with the potential for bioterrorism, 60 days is recommended because of possible inhalational exposure.

**Do NOT use extended-spectrum cephalosporins or trimethoprim/sulfamethoxazole because anthrax may be resistant to these drugs.**

Adapted from CDC's Morbidity and Mortality Weekly Report October 2001

**If you suspect a poisoning exposure from any bioterrorism agent, immediately contact your local county health department, and the Illinois Poison Center at 1-800-222-1222.**