



**Disaster and Terrorism Response:
Emergency Preparedness Tools for Pharmacists and
Health-System Pharmacy Departments
FACT SHEET**

ANTHRAX

BACKGROUND: Anthrax is a spore-forming bacterium (Gram positive rod) capable of causing acute infectious disease. Bioterrorism attacks using anthrax spores have occurred and continue to be a threat. Forms of anthrax disease in humans include inhalational, cutaneous and intestinal.

MECHANISM OF ACTION: Exposure to anthrax bacterium or spores can lead to infection. The latency period of disease onset and clinical effects are determined by the route of exposure.

CLINICAL EFFECTS: Based on route of exposure.

Inhalational Anthrax

- Exposure: inhalation of spores
- Incubation period: 1 to 7 days (hypothetically, up to two months)
- Symptoms:
 - Myalgias
 - Fever
 - Dysphagia
 - Headache and cough (can mimic a common cold or influenza)
 - Symptoms can progress to shortness of breath, hypoxia, respiratory failure and shock.
- Treatment: early diagnosis with gram stain/cultures, supportive care and antibiotics
- CXR may reveal a widened mediastinum. There is a high mortality rate

Cutaneous Anthrax

- Exposure: dermal contact with bacteria or spores
- Incubation period: 1 to 14 days
- Symptoms:
 - Pruritic macular/papular rash that evolves to vesicles and necrotic ulcers.
 - Blackened eschar will develop (often painless).
 - Can also develop fever, myalgias and lymphadenopathy.
- Treatment: Blood and tissue gram stains/cultures, supportive care and antibiotics

Intestinal Anthrax

- Exposure: ingestion of contaminated foods
- Incubation period: 1 to 7 days
- Symptoms:
 - Sore throat
 - Nausea
 - Vomiting
 - Bloody diarrhea
 - Lymphadenopathy
- Treatment: early diagnosis with gram stains/cultures, supportive care, rehydration and antibiotics

TREATMENT: Direct person-to-person transmission of anthrax is unlikely but should be guarded against by the use of personal protective equipment. Early diagnosis, supportive care and initiation of antibiotics are the cornerstones of initial patient management. Antibiotic therapy for treatment and post-exposure prophylaxis includes the use of fluoroquinolones (such as ciprofloxacin) and doxycycline. Antimicrobials can be modified when bacterial susceptibility is ascertained.

- **Duration:** up to 60 days

Life-threatening (inhalational, systemic or serious cutaneous)

Adult Dosing in Life-threatening Situations:

- Ciprofloxacin 400 mg IV q12h
or
- Doxycycline 200 mg IV, then 100 mg IV q12h
or
- Levofloxacin 500-750 mg IV daily
or
- Gatifloxacin 400 mg IV daily

plus 1-2 additional: ampicillin, chloramphenicol, clindamycin, imipenem, linezolid, meropenem, macrolide (erythromycin, clarithromycin, azithromycin), penicillin, rifampin, vancomycin

Pediatric Dosing in Life-threatening Situations:

- Ciprofloxacin 10-15 mg/kg IV q12 h (maximum 500mg/dose)
or
- Doxycycline IV (100mg maximum dose):
 - ▶ Age: ≤ 8 years then dose of 2.2 mg/kg q12h
 - ▶ Age of > 8 years and weight ≤ 45 kg, then dose of 2.2 mg/kg q12h
 - ▶ Age of > 8 years and weight >45 kg then dose of 100 mg q12h

Supportive therapy (aggressive and early) for shock, fluid volume deficit, and adequacy of airway may be indicated.

POST-EXPOSURE PROPHYLAXIS:

Adult Dosing for Post-exposure Prophylaxis:

- Doxycycline 100mg p.o., every 12 hours
Or
- Ciprofloxacin 500mg p.o., every 12 hours
Or
- Levofloxacin 500 mg p.o. daily
Or
- Gatifloxacin 400 mg p.o. daily

Pediatric Dosing for Post-exposure Prophylaxis:

- Ciprofloxacin 10-15 mg/kg p.o. every 12h (max. dose 500 mg)
OR
- Doxycycline p.o. (max. dose 100 mg):
 - ▶ Age of ≤ 8 yrs: 2.2 mg/kg q12h
 - ▶ Age of > 8 yrs and ≤45 kg: 2.2 mg/kg q12h;
 - ▶ Age of >8 yrs and >45 kg: 100 mg q12h

For 24/7 assistance in the emergency management of an actual or suspected chemical terrorism exposure, contact a Certified Regional Poison Information Center at 1-800-222-1222.

Edward P. Krenzelok, PharmD, FAACT, DABAT
Director
Pittsburgh Poison Center
University of Pittsburgh Medical Center
Professor of Pharmacy and Pediatrics
University of Pittsburgh
Information is accurate as of May 2007.

©2007, American Society of Health-System Pharmacists, Inc. All rights reserved.

ASHP is a service mark of the American Society of Health-System Pharmacists, Inc.; registered to the U.S. Patent and Trademark Office,

The information presented herein reflects the opinions of the authors. It should not be interpreted as an official policy of ASHP or as an endorsement of any product.

Because of ongoing research and improvements in technology, the information and its application contained in this fact sheet are constantly evolving and are subject to the professional judgment and interpretation of the practitioner due to the uniqueness of a clinical situation. The authors and the ASHP Research and Education Foundation have made reasonable efforts to ensure the accuracy and appropriateness of the information presented in this document. However, any user of this information is advised that the authors and the ASHP Research and Education Foundation are not responsible for the continued currency of the information, for any errors or omissions, and/or for any consequences arising from the use of the information in the document in any and all practice settings. Any reader of this document is cautioned that the ASHP Research and Education Foundation makes no representation, guarantee or warranty, express or implied as to the accuracy and/or appropriateness of the information contained in this document and specifically disclaims any liability to any party for the accuracy and/or completeness of the material or for any damages arising out of the use or non-use of any of the information contained in this document.