



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

PLAGUE

BACKGROUND: Plague is an infection caused by a gram-negative coccobacillus, *Yersinia pestis*. The bacterium's common hosts are rodents, and transmission to humans occurs either via flea bite, direct contact with infected animals or airborne droplets from patients with pneumonic plague. As a bioterrorism weapon, plague is likely to be transmitted through the dispersion of aerosolized bacteria, which can cause a high primary fatality rate, in addition to secondary spread via infected individuals.

MECHANISM OF ACTION: *Y. pestis* is an extremely virulent organism. After inoculation the bacterium invades the lymphatic system and may secondarily spread through the bloodstream to other organs, such as the spleen, liver, and brain (leading to/causing meningitis). Primary pneumonic plague may occur via airborne transmission of the bacterium. The latency period of disease onset and clinical effects are determined by the route of exposure.

CLINICAL EFFECTS: Based on route of exposure.

Bubonic Plague

- Exposure: Inoculation via infected flea bite
- Incubation period: 2 to 6 days
- Symptoms:
 - Chills
 - Fever
 - Myalgias
 - Arthralgias
 - Headache
 - Weakness
 - Tenderness/pain in affected lymph node (femoral, inguinal, axillary, etc.)
 - Bubo formation

Septicemic Plague

- Exposure: Same as bubonic plague.
- Incubation period: 2 to 6 days
- Symptoms:
 - Absence of typical bubo
 - Nausea
 - Vomiting
 - Diarrhea
 - Rapid development of fulminant septic shock, Disseminated intravascular coagulation (DIC), and Hemorrhaging into the skin and other organs

Pneumonic Plague

- Exposure: Direct inhalation from infected animals, patients
- Incubation period: 1 to 4 days
- Symptoms:
 - Fever
 - Chills
 - Myalgias

Headache
Weakness
Cough
Chest pain
Hemoptysis
Rapidly progressive respiratory failure

TREATMENT: Direct person-to-person transmission of plague is possible and droplet precaution should be implemented until the patient has completed 72 hours of antimicrobial therapy. Early diagnosis, supportive care and the initiation of antibiotics within the first 24 hours of symptom onset are the cornerstones of initial patient management. Antibiotic therapy includes fluoroquinolones, aminoglycosides, doxycycline or chloramphenicol. Oral fluoroquinolones or doxycycline is options for post-exposure prophylaxis.

Duration: 10 days or until afebrile for 2-3 days, whichever is longer

Plague pneumonia:

Adults:

- Gentamicin 2mg/kg load, 1.7 mg/kg IV/IM q8h (or 5 mg/kg once daily)
(Adjust dose for renal function. Determine optimum dose by blood levels.)
or
- Ciprofloxacin 500mg p.o. q12 h, Levofloxacin 500 mg p.o. daily, or Gatifloxacin 400mg p.o. daily
or
- Doxycycline 200mg load, then 100mg q12h

Children:

- Gentamicin 2.5 mg/kg IV/IM q8h
or
- 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 q12hor
- Chloramphenicol 25 mg/kg IV q6h

Plague meningitis:

Adults:

- Chloramphenicol IV 25 mg/kg load, then 12.5 mg/kg q6h

Children:

- Chloramphenicol IV 25 mg/kg load, then 15 mg/kg q6h

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

POST-EXPOSURE PROPHYLAXIS:

Duration: 7 days after last exposure

Adults:

- Ciprofloxacin 500 mg p.o. q12h
or

- Doxycycline 100 mg p.o. q12h
- or
- Levofloxacin 500 mg p.o. daily
- or
- Gatifloxacin 400 mg p.o. daily

Alternatives:

- Chloramphenicol 25 mg/kg p.o. q6h
- or
- T ▪ Tetracycline 500 mg p.o. q6h

Children:

- Ciprofloxacin 15-20 mg/kg p.o. q12h (max. dose 500 mg)
- or
- Doxycycline 2.2 mg/kg/day p.o. q12h (max 100mg/dose)
- or
- Tetracycline 20-50 mg/kg/day p.o. q6h
- or
- Chloramphenicol 25 mg/kg p.o. q6h

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. Krenzelo, 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.