

STATE OF COLORADO

Bill Owens, Governor
Douglas H. Benevento, Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S.
Denver, Colorado 80246-1530
Phone (303) 692-2000
TDD Line (303) 691-7700
Located in Glendale, Colorado

Laboratory Services Division
8100 Lowry Blvd.
Denver, Colorado 80230-6928
(303) 692-3090

<http://www.cdphe.state.co.us>



Colorado Department
of Public Health
and Environment

PLAGUE

Guidelines for Emergency Departments and Health Care Providers

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CLINICAL FEATURES

- **Bubonic plague:** [most common form] abrupt onset of high fever, chills, prostration and unilateral enlarged, extremely tender lymph node(s) usually inguinal, axillary or cervical.
- **Septicemic plague:** septic shock syndrome with DIC and small vessel necrosis; *may develop secondary to bubonic form or as primary bacterial sepsis without noticeable bubo.*
- **Pneumonic plague:** [least common form] fever, cough, dyspnea, chest pain and hemoptysis; *may be primary form or develop secondary to bubonic and/or septicemic forms.*
- **Incubation period:** 2 to 6 days for bubonic plague; 1 to 4 days for primary pneumonic plague
- **Case fatality:** 50-60% for untreated bubonic and 100% for untreated septicemic/pneumonic plague; historic case fatality rate in Colorado is 18%.

ETIOLOGIC AGENT

Yersinia pestis: gram-negative (cocco)bacillus; bipolar-staining; typically slow growing (≥ 48 hours)

MODES OF TRANSMISSION

- **Most common:** bite of infectious rodent fleas (e.g. prairie dogs, ground squirrels, wood rats)
 - Dogs/cats may carry infectious fleas from active plague area back to the home.
- **Less common:** direct contact with infectious body fluids/tissues of infected animal.
 - Outdoor cats may become infected from hunting infected rodents. Transmission from cats has occurred via bites, scratches, contact with abscess exudates and pneumonic spread.
- **Less common:** inhalation of infectious respiratory droplets from infected cat or human with pneumonic plague, or exposure to laboratory aerosols.

EPIDEMIOLOGY

- Plague is endemic and maintained in a complex cycle among wild rodents and rabbits and their fleas in the western U.S. Patients generally have a history of exposure in rural areas.
- Most human cases occur in summer and early fall months. Colorado averages two cases per year.
- Free-roaming pets have been increasingly implicated in human cases from bringing infected fleas into the home. Unlike cats, dogs rarely become ill and do not transmit plague directly.

WHAT TO DO - SUSPECTED CASE

- Place patient in contact and droplet (until pneumonic involvement ruled out) precautions
- **Report to State** (303-692-2700 or after hours: 303-370-9395) or local health department

LABORATORY DIAGNOSIS

- Aspirate from bubo for gram stain, fluorescent antibody (DFA) stain, PCR, and culture
- Blood cultures (obtained **before** initiation of antibiotic treatment) for PCR and culture
- Chest x-ray to rule out pneumonic involvement
- Sputum for gram stain and culture (for patients with suspected pneumonic involvement)
- Serum for acute and convalescent antibody titers

TREATMENT

- **Adults:**
 - Streptomycin – 1 gram IM bid
 - OR Gentamycin - 5mg/kg IM or IV once daily
 - Alternative: doxycycline 100 mg IV bid or ciprofloxacin 400 mg IV bid
- **Children:**
 - Streptomycin – 15 mg/kg IM bid (maximum daily dose = 2 g)
 - OR Gentamycin - 2.5mg/kg IM or IV tid
 - Alternative: doxycycline (if <45kg) 2.2 mg/kg IV bid or ciprofloxacin 15 mg/kg IV bid
 - NOTE: Doxycycline (<8 yrs) or ciprofloxacin (<18yrs) should not be given to children unless the benefits of use outweigh the risks
- Drainage/debridement of abscessed buboes may be necessary.

PROPHYLAXIS OF CONTACTS

- **ONLY indicated for close contacts of patients with pneumonic** (primary or secondary) plague
- Close contact is defined as being within 6.5 feet (2 meters) of infectious person
- Other contacts not meeting criteria for “close” may be put on fever surveillance x 7 days
- **Adults:**
 - Doxycycline – 100 mg orally bid x 7 days
 - Alternative: ciprofloxacin 500 mg orally bid x 7 days
- **Children:**
 - Doxycycline – (if <45 kg) 2.2 mg/kg orally bid x 7 days
 - Alternative: ciprofloxacin 20 mg/kg orally bid x 7 days
 - NOTE: Doxycycline (<8 yrs) or ciprofloxacin (<18yrs) should not be given to children unless the benefits of use outweigh the risks

MORE INFORMATION

State Health Dept.(CDPHE): <http://www.cdphe.state.co.us/dc/zoonosis/plague/plaguehom.html>

Centers for Disease Control (CDC): <http://www.bt.cdc.gov/agent/plague/index.asp>

CDC On-Line Plague Training Module for C.E. credit:

<http://www.bt.cdc.gov/agent/plague/trainingmodule/index.asp>

References:

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American Academy of Pediatrics. Plague. In: Pickering LK, ed. *Red Book: 2003 Report of the Committee on Infectious Diseases*. 26th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2003:487-489.
Centers for Disease Control and Prevention. Prevention of Plague: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1996;45(No. RR-14):1-4.