**Bioterrorism & Emerging Infectious Diseases Plan**

**Introduction**
UTMB hospitals and clinics are potential destinations for large numbers of patients who have been simultaneously exposed to a biological agent or have become ill with an emerging infectious disease.

If this should occur, or syndromic surveillance by our medical professionals detect an outbreak or exposure, the **Institutional Emergency Plan** shall be utilized, in conjunction with the **Bioterrorism Readiness & Emerging Infectious Diseases (EID) Readiness Plans** to coordinate an effective response.

The Institutional Emergency Preparedness Officer, Administrative Emergency Preparedness Officer Director of Infection Control & Hospital Epidemiology, Vice President and CEO for Hospitals and Clinics, Chief Nursing Officer and others as required will determine the proper response by implementing any of the following actions, or other actions as necessary:

- Limiting access to patient areas by visitors, medical staff or support personnel
- Co-horting of patients with similar symptoms
- Preferential use of negative air flow rooms or units
- Directing modifications of Contact Precautions or expanding use of personal protective equipment
- Suspending elective admissions and/or canceling elective surgical or invasive procedures
- Diverting patients (with or without specific symptoms) from emergency room services
- Establishing alternative site(s) for inpatient acute care
- Implementing the hospital emergency plan for staffing, delivery of critical medications or supplies and lockdown/access by limited authorized staff members
- Any other measure to:
  - Assure containment of disease spread
  - Minimize exposure to caregivers and other patients
  - Provide care necessary to the infected/exposed population

These institutional measures support specific protocols to be utilized in the identification and treatment of a broad range of emerging infectious diseases as described in the Bioterrorism Readiness Plan and Emerging Infectious Diseases Readiness Plan.

**Reporting Requirements**

UTMB may be the initial site of recognition and response to bioterrorism or emerging infectious diseases events. If a bioterrorism event is suspected, local emergency response systems should be activated. Notification should immediately include Infection Control & Healthcare Epidemiology, Hospital Administration, local law enforcement, the FBI and the Galveston County Health District.

For suspected emerging infectious diseases, Infection Control & Healthcare Epidemiology, Hospital Administration and the Galveston County Health District should be notified.

**Internal Contacts:**

| Infection Control & Healthcare Epidemiology: | office | (409) 772-3192 |
| Director, Infection Control & Healthcare Epidemiology: | pager | (409) 643-3133 |
| Administration/Public Affairs: | office | (409) 772-2618 |

**External Contacts:**

| Local Police Department: | (409) 797-3702 |
| Local Health Department: | (409) 765-2514 |
| State Health Department: | (888) 963-7111 |
| FBI Field Office (24 hours) | (713) 693-5000 |
| Bioterrorism Emergency Number, CDC Emergency Response: | (770) 488-7100 |

**Potential Agents for Bioterrorism**
Five diseases with recognized bioterrorism potential (anthrax, botulism, plague, smallpox and tularemia) and the agents
responsible for them are described in this document.

Potential Agents for Emerging Infectious Diseases
Two diseases (Severe Acute Respiratory Syndrome [SARS] and avian influenza) are currently of concern but others may appear in the future.

Authority Statement
In the event of a bioterrorism event or expression of an emerging infectious disease, the Hospital Epidemiologist or his designee and the Medical Director will determine preferential admissions, limit visitation and activate the emergency management plan. The Hospital Epidemiologist or his designee will define the triage questions to be asked that will define the population of concern.

Detection of Outbreaks

Syndrome-based criteria
Rapid response to a bioterrorism-related outbreak requires prompt identification of its onset. Because of the rapid progression to illness and potential for dissemination of some of these agents, it may not be practical to await diagnostic laboratory confirmation. Instead, it will be necessary to initiate a response based on the recognition of high-risk syndromes.

Epidemiologic features
Epidemiologic principles must be used to assess whether a patient’s presentation is typical of an endemic disease or is an unusual event that should raise concern. Features that should alert healthcare providers to the possibility of a bioterrorism-related outbreak include:

- A rapidly increasing disease incidence (e.g., within hours or days) in a normally healthy population.
- An epidemic curve that rises and falls during a short period of time.
- An unusual increase in the number of people seeking care, especially with fever, respiratory, or gastrointestinal complaints.
- An endemic disease rapidly emerging at an uncharacteristic time or in an unusual pattern.
- Lower attack rates among people who had been indoors, especially in areas with filtered air or closed ventilation systems, compared with people who had been outdoors.
- Clusters of patients arriving from a single locale.
- Large numbers of rapidly fatal cases.
- Any patient presenting with a disease that is relatively uncommon and has bioterrorism potential (e.g., inhalation anthrax, or pulmonary tularemia or plague).

Clinical Microbiology Laboratory
All specimens obtained for diagnostic purposes will be sent to the Clinical Microbiology Laboratory (Microbiology Specimen Receiving, McCullough 5.137). All specimens should be labeled with the suspected bioterrorism agent. The laboratory in turn may send the specimen to the TDH, CDC, or another reference laboratory. Employees in the Clinical Microbiology laboratory will receive education about the microbiology of bioterrorism agents, unique growth requirements, identification, and specific handling instructions, including information on how to send the organisms through the mail.

Campus Police
In the event of a mass exposure, campus security will be used to maintain order. Areas of the campus may be secured to provide patient triage or patient care. Campus security will work with Galveston Police or state and federal officials if necessary. Patients may be quarantined in their homes. Campus Security will support this city/state mandate and help with communications and potential hysteria.

Psychological Aspects of Bioterrorism
Following a bioterrorism-related event, fear and panic can be expected from both patients and healthcare providers. Psychological responses following a bioterrorism event may include horror, anger, panic, unrealistic concerns about infection, fear of contagion, paranoia, social isolation, or demoralization. Mental Health Support Personnel (e.g., psychiatrists, psychologists, social workers, clergy, and volunteer groups) will assist in collaboration with emergency response agencies and the media. Local, state, and federal media experts can provide assistance with communications needs. The following issues need to be addressed to alleviate the public fear:
1. Minimize panic by clearly explaining risks, offering careful but rapid medical evaluation/treatment, and avoiding unnecessary isolation or quarantine.

2. Treat anxiety in unexposed persons who are experiencing somatic symptoms (e.g., with reassurance, or diazepam-like anxiolytics as indicated for acute relief of those who do not respond to reassurance).

3. Consider the following to address healthcare worker fears:
   - Provide bioterrorism readiness education, including frank discussions of potential risks and plans for protecting healthcare providers.
   - Invite active, voluntary involvement in the bioterrorism readiness planning process.
   - Encourage participation in disaster drills.
   - Fearful or anxious healthcare workers may benefit from their usual sources of social support, or by being asked to fulfill a useful role (e.g., as a volunteer at the triage site).

**Patient, Visitor, and Public Information**
Clear, consistent, understandable information should be provided (e.g., via fact sheets) to patients, visitors, and the general public. During bioterrorism-related outbreaks, visitors may be strictly limited.

**Community Response**
UTMB is a key component in the community-based bioterrorism plan. Emergency medical services, police, fire and rescue workers will be educated about the signs and symptoms of various biologic agents and be knowledgeable of the UTMB triage program for each organism. The Galveston County Health District will play an integral part in the UTMB Bioterrorism Preparedness Plan.

**Emergency Medical Services**
Emergency Medical Services will be provided by the Galveston Area Ambulance Authority (GAAA). During a terrorist attack, communication will be established and maintained between UTMB and GAAA.

**Decontamination of Patients and Environment**
The need for decontamination depends on the suspected exposure and in most cases will not be necessary. The goal of decontamination after a potential exposure to a bioterrorism agent is to reduce the extent of external contamination of the patient and contain the contamination to prevent further spread. Decontamination should only be considered in instances of gross contamination.

Decisions regarding the need for decontamination should be made in consultation with local health departments and Infection Control & Healthcare Epidemiology. Decontamination of exposed individuals prior to receiving them at UTMB may be necessary to ensure the safety of patients and staff while providing care.

Depending on the agent, the likelihood for re-aerosolization, or a risk associated with cutaneous exposure, clothing of exposed persons may need to be removed. Patients may be decontaminated prior to entry into the Emergency Department or may be instructed (or assisted if necessary) to immediately shower with soap and water. *Potentially harmful practices, such as bathing patients with bleach solutions, are unnecessary and should be avoided.*

Clean water, saline solution, or commercial ophthalmic solutions are recommended for rinsing eyes. If indicated, after removal at the decontamination site, patient clothing should be handled only by personnel wearing appropriate personal protective equipment, and placed in an impervious bag to prevent further environmental contamination. The FBI may collect clothing and other potential evidence for submission to FBI or Department of Defense laboratories to assist in exposure investigations.

**Emergency Department**
Many people who are ill from a bioterrorism agent will be seen in the Emergency Room. Healthcare workers must be aware of the signs and symptoms of each disease.

- In the best-case scenario, the disease of the affected patient will be recognized by the Emergency Medical Personnel and pertinent information shared via dispatch.
- Upon recognition or suspicion of a bioterrorism agent, Infection Control & Healthcare Epidemiology must be notified immediately. They in-turn will notify the Galveston County Health District, University Relations, the Medical Director, and Chief Operating Officer. Further communication with law enforcement, TDH, or the CDC will be done at the direction of the Galveston County Health District.
- The patient must be triaged for illness vs. exposure to disease and cared for appropriately. The attached Clinical Pathways include admission criteria for specific syndromes. People exposed to a biological agent may only require prophylaxis. See prophylaxis regimes for specific diseases.
Upon discharge from the Emergency Department, the patient will be given specific educational material and instructions about medical follow-up including medications.

**Triage and Management for Large-scale Events**

Triage and management planning for large-scale events may include:

- Establishing networks of communication and lines of authority required to coordinate on-site care.
- Planning for cancellation of non-emergency services and procedures. Identifying sources able to supply available vaccines, immune globulin, antibiotics, and botulinum anti-toxin (with assistance from local and state health departments).
- Planning for the efficient evaluation and discharge of patients.
- Developing discharge instructions for patients determined to be non-contagious or in need of additional on-site care, including details regarding if and when they should return for care or if they should seek medical follow-up.
- Determining availability and sources for additional medical equipment and supplies (e.g., ventilators) that may be needed for urgent large-scale care.
- Planning for the allocation or re-allocation of scarce equipment in the event of a large-scale event (e.g., duration of ventilator support for terminally afflicted individuals).
- With assistance from the Pathology service, identifying the institution’s ability to manage a sudden increase in the number of cadavers on site.

**Pharmacy**
The UTMB pharmacy will stockpile the antibiotics for distribution in the event of a bioterrorist attack. Suspensions will be available for children. Alternative antibiotics will be available for those who have allergies to the drugs of first choice. The stockpiled antibiotics will be pre-labeled and in unit doses/or volumes that can be easily distributed. The stock will contain enough medicine to sustain UTMB to treat patients until the Texas Department of Health can provide assistance.

**Patients prophylaxis and post-exposure immunization**

All drugs released to patients in an outpatient setting will be accompanied by a “Fact Sheet”, describing the disease and the medicine being used to treat the disease. The fact sheet written in English, Spanish, and Vietnamese will be signed by the patient indicating that they understand the risk-benefit of the medication. The signed copy of the fact sheet will be retained.

In the event that a large number of people require prophylaxis, the Lecture Hall on the third floor of the Clinical Science Building will be used as a distribution center. The pharmacy will employ the following plan of action:

- **Healthcare Workers**
  In general, maintenance of accurate occupational health records will facilitate identification, contact, assessment, and delivery of post-exposure care to potentially exposed healthcare workers.

- **Hospital Clinical Staff**
  It is imperative that hospital clinical staff receive education regarding the management of patients with each bioterrorism agent. An Infectious Diseases consultation is strongly suggested for these patients.
Agent-specific Recommendations

Anthrax

DESCRIPTION OF AGENT / SYNDROME

Etiology
Anthrax is an acute infectious disease caused by *Bacillus anthracis*, a spore forming, gram-positive bacillus. Associated disease occurs most frequently in sheep, goats, and cattle, which acquire spores through ingestion of contaminated soil. Humans can become infected through skin contact, ingestion, or inhalation of *B. anthracis* spores from infected animals or animal products (as in “woolsorter’s disease” from exposure to goat hair). Person-to-person transmission of inhalational disease does not occur. Direct exposure to vesicle secretions of cutaneous anthrax lesions may result in secondary cutaneous infection.

Clinical features
Human anthrax infection can occur in three forms: inhalational, cutaneous, or gastrointestinal, depending on the route of exposure. Of these forms, inhalational anthrax is associated with bioterrorism exposure to aerosolized spores. Clinical features for each form of anthrax include:

**Inhalational**
- Non-specific prodrome of flu-like symptoms follows inhalation of infectious spores.
- Sore throat, rhinorrhea and purulent sputum are uncommon but reported. (2)
- Two to four days after initial symptoms, abrupt onset of respiratory failure and hemodynamic collapse, possibly accompanied by thoracic edema and a widened mediastinum on chest radiograph suggestive of mediastinal lymphadenopathy and hemorrhagic mediastinitis.
- Gram-positive bacilli on blood culture, usually after the first two or three days of illness.
- Treatable in early pro-dromal stage. Mortality remains extremely high despite antibiotic treatment if it is initiated after onset of respiratory symptoms.

**Cutaneous**
- Local skin involvement after direct contact with spores or bacilli.
- Commonly seen on the head, forearms or hands.
- Localized itching, followed by a papular lesion that turns vesicular, and within 2-6 days develops into a depressed black eschar often associated with extensive local edema.
- Usually non-fatal if treated with antibiotics.

**Gastrointestinal**
- Abdominal pain, nausea, vomiting, and fever following ingestion of contaminated food, usually meat.
- Bloody diarrhea, hematemesis, massive ascites, acute abdomen.
- Gram-positive bacilli on blood culture, usually after the first two or three days of illness.
- Usually fatal after progression to toxemia and sepsis.

**Modes of transmission**
The spore form of *B. anthracis* is durable. As a bioterrorism agent, it could be delivered as an aerosol. The modes of transmission for anthrax include:
- Inhalation of spores.
- Cutaneous contact with spores or spore-contaminated materials.
- Ingestion of food contaminated with spores.

**Incubation period**
The incubation period following exposure to *B. anthracis* ranges from 1 day to 8 weeks (average 5 days), depending on the exposure route and dose:
- 2-60 days following exposure by inhalation (median 4 days).
- 1-7 days following cutaneous exposure.
- 1-7 days following ingestion.
**Period of communicability**
Transmission of anthrax infections from person to person is unlikely. Airborne transmission does not occur, but direct contact with skin lesions may result in cutaneous infection.

**INFECTION CONTROL PRACTICES FOR PATIENT MANAGEMENT**
Symptomatic patients with suspected or confirmed infections with B. anthracis should be managed according to current guidelines specific to their disease state. See ER Triage of Anthrax (Appendix B) and Clinical Management of Anthrax (Appendix 1 and 2).

**Isolation precautions**
Universal Precautions are used for the care of patients with infections associated with B. anthracis. Universal Precautions include the routine use of gloves for contact with nonintact skin, including rashes and skin lesions.

**Patient placement**
Private room placement for patients with anthrax is not necessary. Airborne transmission of anthrax does not occur. Skin lesions may be infectious, but transmission requires direct skin contact.

**Patient transport**
Universal Precautions should be used for transport and movement of patients with B.anthracis infections.

**Cleaning, disinfection, and sterilization of equipment and environment**
Principles of Universal Precautions should be generally applied for the management of patient-care equipment and for environmental control.

**Discharge management**
No special discharge instructions are indicated. Home care providers should be taught to use Universal Precautions for all patient care (e.g., dressing changes).

**Post-mortem care**
Universal Precautions should be used for post-mortem care. Universal Precautions include wearing appropriate personal protective equipment, including masks and eye protection, when generation of aerosols or splatter of body fluids is anticipated.

**TREATMENT**
Whenever possible, consultation with an Infectious Diseases Specialist or Dermatologist (for cutaneous lesions) is recommended. See [Table 1](#) for treatment of inhalational anthrax and [Table 2](#) for treatment of cutaneous anthrax.
### TABLE 1. Inhalational anthrax treatment protocol* for cases associated with this bioterrorism attack

<table>
<thead>
<tr>
<th>Category</th>
<th>Initial therapy (intravenous)† ‡ §</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults</td>
<td>Ciprofloxacín 400 mg every 12 hrs* or Doxycycline 100 mg every 12 hrs† ‡ and One or two additional antimicrobials§</td>
<td>IV treatment initially**. Switch to oral antimicrobial therapy when clinically appropriate: Ciprofloxacín 500 mg po BID or Doxycycline 100 mg po BID Continue for 60 days (IV and po combined)† ‡</td>
</tr>
<tr>
<td>Children</td>
<td>Ciprofloxacín 10–15 mg/kg every 12 hrs% ‡ ‡ § or Doxycycline† ‡ ‡ &gt;8 yrs and &gt;45 kg: 100 mg every 12 hrs 8 yrs and ≤45 kg: 2.2 mg/kg every 12 hrs &lt;8 yrs: 2.2 mg/kg every 12 hrs and One or two additional antimicrobials§</td>
<td>IV treatment initially**. Switch to oral antimicrobial therapy when clinically appropriate: Ciprofloxacín 10–15 mg/kg po every 12 hrs% ‡ ‡ or Doxycycline† ‡ ‡ &gt;8 yrs and &gt;45 kg: 100 mg po BID 8 yrs and ≤45 kg: 2.2 mg/kg po BID &lt;8 yrs: 2.2 mg/kg po BID Continue for 60 days (IV and po combined)† ‡</td>
</tr>
<tr>
<td>Pregnant women† ‡ ‡</td>
<td>Same for nonpregnant adults (the high death rate from the infection outweighs the risk posed by the antimicrobial agent)</td>
<td>IV treatment initially. Switch to oral antimicrobial therapy when clinically appropriate. Oral therapy regimens same for nonpregnant adults</td>
</tr>
<tr>
<td>Immunocompromised persons and children</td>
<td>Same for nonimmunocompromised persons and children</td>
<td>Same for nonimmunocompromised persons and children</td>
</tr>
</tbody>
</table>

* For gastrointestinal and oropharyngeal anthrax, use regimens recommended for inhalational anthrax.
† Ciprofloxacín or doxycycline should be considered an essential part of first-line therapy for inhalational anthrax.
‡ Steroids may be considered as an adjunct therapy for patients with severe edema and for meningitis based on experience with bacterial meningitis of other etiologies.
§ Other agents with in vitro activity include rifampin, vancomycin, penicillin, ampicillin, cloramphenicol, trimethoprim, clindamycin, and clindamycin. Because of concerns of constitutive and inducible beta lactamases in *Bacillus anthracis*, penicillin and ampicillin should not be used alone. Consultation with an infectious disease specialist is advised.
** Initial therapy may be altered based on clinical course of the patient; one or two antimicrobial agents (e.g., ciprofloxacín or doxycycline) may be adequate as the patient improves.
† † If meningitis is suspected, doxycycline may be less optimal because of poor central nervous system penetration.
‡ ‡ Because of the potential persistence of spores after an aerosol exposure, antimicrobial therapy should be continued for 60 days.
§ † If intravenous ciprofloxacín is not available, oral ciprofloxacín may be acceptable because it is rapidly and well absorbed from the gastrointestinal tract with no substantial loss by first-pass metabolism. Maximum serum concentrations are attained 1–2 hours after oral dosing but may not be achieved if vomiting or ileus are present.
% ‡ ‡ In children, ciprofloxacín dosage should not exceed 1 g/day.
† ‡ ‡ The American Academy of Pediatrics recommends treatment of young children with tetracyclines for serious infections (e.g., Rocky Mountain spotted fever).
† † † Although tetracyclines are not recommended during pregnancy, their use may be indicated for life-threatening illness. Adverse effects on developing teeth and bones are dose related; therefore, doxycycline might be used for a short time (7–14 days) before 6 months of gestation.
LABORATORY SUPPORT AND CONFIRMATION

Diagnosis of anthrax is confirmed by aerobic culture performed in a BSL-2 laboratory.

Diagnostic samples
- Blood cultures.
- Vesical fluid from skin lesions.
- Acute serum for frozen storage.
- Stool culture if gastrointestinal disease is suspected.

Laboratory selection
Handling of clinical specimens should be coordinated with local and state health departments, and undertaken in BSL-2 or -3 laboratories. The FBI will coordinate collection of evidence and delivery of forensic specimens to FBI or Department of Defense laboratories.

Transport requirements
Specimen packaging and transport must be coordinated with local and state health departments, and the FBI. A chain of custody document should accompany the specimen from the moment of collection. For specific instructions, contact the Bioterrorism Emergency Number at the CDC Emergency Response Office, 770/488-7100. Advance planning may include identification of appropriate packaging materials and transport media in collaboration with the clinical laboratory at individual facilities.

POST-EXPOSURE MANAGEMENT
Decontamination of patients / environment
The risk for re-aerosolization of B. anthracis spores appears to be extremely low in settings where spores were released intentionally or were present at low or high levels. In situations where the threat of gross exposure to B. anthracis spores exists, cleansing of skin and potentially contaminated fomites (e.g. clothing or environmental surfaces) may be considered to reduce the risk for cutaneous and gastrointestinal forms of disease. The plan for decontaminating patients exposed to anthrax may include the following:
- Instructing patients to remove contaminated clothing and store in labeled, plastic bags.

### TABLE 2. Cutaneous anthrax treatment protocol* for cases associated with this bioterrorism attack

<table>
<thead>
<tr>
<th>Category</th>
<th>Initial therapy (oral)</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults*</td>
<td>Ciprofloxacin 500 mg BID or Doxycycline 100 mg BID</td>
<td>60 days¹</td>
</tr>
<tr>
<td>Children*</td>
<td>Ciprofloxacin 10-15 mg/kg every 12 hrs (not to exceed 1 g/day) or Doxycycline:  &gt;8 yrs and ≥45 kg: 100 mg every 12 hrs &gt;8 yrs and &lt;45 kg: 2.2 mg/kg every 12 hrs ≤8 yrs: 2.2 mg/kg every 12 hrs</td>
<td>60 days¹</td>
</tr>
<tr>
<td>Pregnant women***</td>
<td>Ciprofloxacin 500 mg BID or Doxycycline 100 mg BID</td>
<td>60 days¹</td>
</tr>
<tr>
<td>Immunocompromised persons*</td>
<td>Same for nonimmunocompromised persons and children</td>
<td>60 days¹</td>
</tr>
</tbody>
</table>

* Cutaneous anthrax with signs of systemic involvement, extensive edema, or lesions on the head or neck require intravenous therapy, and a multidrug approach is recommended. Table 1.
¹ Ciprofloxacin or doxycycline should be considered first-line therapy. Amoxicillin 500 mg po TID for adults or 80 mg/kg/day divided every 8 hours for children is an option for completion of therapy after clinical improvement. Oral amoxicillin dose is based on the need to achieve appropriate minimum inhibitory concentration levels.
² Previous guidelines have suggested treating cutaneous anthrax for 7–10 days, but 60 days is recommended in the setting of this attack, given the likelihood of exposure to aerosolized B. anthracis (6).
³ The American Academy of Pediatrics recommends treatment of young children with tetracyclines for serious infections (e.g., Rocky Mountain spotted fever).
** Although tetracyclines or ciprofloxacin are not recommended during pregnancy, their use may be indicated for life-threatening illness. Adverse effects on developing teeth and bones are dose related; therefore, doxycycline might be used for a short time (7–14 days) before 6 months of gestation.
• Handling clothing minimally to avoid agitation.
• Instructing patients to shower thoroughly with soap and water (and providing assistance if necessary).
• Instructing personnel regarding Universal Precautions and wearing appropriate barriers (e.g. gloves, gown, and respiratory protection) when handling contaminated clothing or other contaminated fomites.
• Decontaminating environmental surfaces using a hospital-grade disinfectant.

Prophylaxis and post-exposure immunization

Recommendations for prophylaxis are subject to change.

**TABLE 1. Interim recommendations for postexposure prophylaxis for prevention of inhalational anthrax after intentional exposure to Bacillus anthracis**

<table>
<thead>
<tr>
<th>Category</th>
<th>Initial therapy</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults (including pregnant women and immunocompromised persons)</td>
<td>Ciprofloxacin 500 mg po BID or Doxycycline 100 mg po BID</td>
<td>60 days</td>
</tr>
<tr>
<td>Children</td>
<td>Ciprofloxacin 10–15 mg/kg po q12 hrs* or Doxycycline: &gt;8 yrs and &gt;45 kg: 100 mg po BID; &gt;8 yrs and ≤45 kg: 2.2 mg/kg po BID; ≤8 yrs: 2.2 mg/kg po BID</td>
<td>60 days</td>
</tr>
</tbody>
</table>

*Ciprofloxacin dose should not exceed 1 gram per day in children.

Postexposure prophylaxis is indicated to prevent inhalational anthrax after a confirmed or suspected aerosol exposure. When no information is available about the antimicrobial susceptibility of the implicated strain of *B. anthracis*, initial therapy with ciprofloxacin or doxycycline is recommended for adults and children. Use of tetracyclines and fluoroquinolones in children has adverse effects. The risks for these adverse effects must be weighed carefully against the risk for developing life-threatening disease. As soon as penicillin susceptibility of the organism has been confirmed, prophylactic therapy for children should be changed to oral amoxicillin 80 mg/kg of body mass per day divided every 8 hours (not to exceed 500 mg three times daily). *B. anthracis* is not susceptible to cephalosporins or to trimethoprim/sulfamethoxazole, and these agents should not be used for prophylaxis. Prophylaxis should continue until *B. anthracis* exposure has been excluded. If exposure is confirmed, prophylaxis should continue for 60 days.

**Triage and management of large scale exposures / potential exposures**

- Triage of exposed patients will be conducted in the Lecture Hall on the third floor of the Clinical Science Building.
- The pharmacy plan for large-scale prophylaxis will be activated.
- Personnel from Nursing, Clinical Laboratories, Medical Records, and Administration will be mobilized.
- University Public Affairs will be immediately notified.
- ICU committee will be immediately convened in the event of patients presenting inhalation of Anthrax.
- Bed and ventilator availability will be discussed.

**PATIENT, VISITOR AND PUBLIC INFORMATION**

Fact sheets for distribution should be prepared, including explanation that people recently exposed to *B. anthracis* are not contagious.
**Botulism**

**DESCRIPTION OF AGENT / SYNDROME**

**Etiology**

*Clostridium botulinum* is an anaerobic gram-positive bacillus that produces a potent neurotoxin, botulinum toxin. In humans, botulinum toxin inhibits the release of acetylcholine, resulting in characteristic flaccid paralysis. *C. botulinum* produces spores that are present in soil and marine sediment throughout the world. Foodborne botulism is the most common form of disease in adults. An inhalational form of botulism is also possible. Botulinum toxin exposure may occur in both forms as agents of bioterrorism.

**Clinical features**

Foodborne botulism is accompanied by gastrointestinal symptoms. Inhalational botulism and foodborne botulism are likely to share other symptoms including:

Responsive patient with absence of fever.

Symmetric cranial neuropathies (drooping eyelids, weakened jaw clench, difficulty swallowing or speaking).

Blurred vision and diplopia due to extra-ocular muscle palsies.

Symmetric descending weakness in a proximal to distal pattern (paralysis of arms first, followed by respiratory muscles, then legs).

Respiratory dysfunction from respiratory muscle paralysis or upper airway obstruction due to weakened glottis. No sensory deficits.

**Modes of transmission**

Botulinum toxin is generally transmitted by ingestion of toxin-contaminated food. Aerosolization of botulinum toxin has been described and may be a mechanism for bioterrorism exposure.

**Incubation period**

Neurologic symptoms of foodborne botulism begin 12 - 36 hours after ingestion.

Neurologic symptoms of inhalational botulism begin 24- 72 hours after aerosol exposure.

**Period of communicability**

Botulism is not transmitted from person to person.

**INFECTION CONTROL PRACTICES FOR PATIENT MANAGEMENT**

Symptomatic patients with suspected or confirmed botulism should be managed according to current guidelines. Recommendations for therapy are beyond the scope of this document. For up-to-date information and recommendations for therapy, contact CDC or state health department.

**Isolation precautions**

Universal Precautions are used for the care of patients with botulism.

**Patient placement**

Patient-to-patient transmission of botulism does not occur. Patient room selection and care should be consistent with facility policy.

**Patient transport**

Universal Precautions should be used for transport and movement of patients with botulism.

**Cleaning, disinfection, and sterilization of equipment and environment**

Principles of Universal Precautions should be generally applied to the management of patient-care equipment and environmental control.
Discharge management
No special discharge instructions are indicated.

Post-mortem care
Universal Precautions should be used for post-mortem care.

LABORATORY SUPPORT AND CONFIRMATION

 Obtaining diagnostic samples
Routine laboratory tests are of limited value in the diagnosis of botulism. Detection of toxin is possible from serum, stool samples, or gastric secretions. For advice regarding the appropriate diagnostic specimens to obtain, contact state health authorities or CDC (Foodborne and Diarrheal Diseases Branch, 404/639-2888).

Laboratory selection
Handling of clinical specimens should be coordinated with local and state health departments. The FBI will coordinate collection of evidence and delivery of forensic specimens to FBI or Department of Defense laboratories.

Transport requirements
Specimen packaging and transport must be coordinated with local and state health departments, and the FBI. A chain of custody document should accompany the specimen from the moment of collection. For specific instructions, contact the Bioterrorism Emergency Number at the CDC Emergency Response Office, 770/488-7100. Advance planning may include identification of appropriate packaging materials and transport media in collaboration with the clinical laboratory at individual facilities.

Patient, Visitor, and Public Information
Fact sheets for distribution should be prepared, including explanation that people exposed to botulinum toxin are not contagious. A clear description of symptoms including blurred vision, drooping eyelids, and shortness of breath should be provided with instructions to report for evaluation and care if such symptoms develop.

POST-EXPOSURE MANAGEMENT
Suspicion of even single cases of botulism should immediately raise concerns of an outbreak potentially associated with shared contaminated food. The Galveston County Health District will be notified immediately 24 hours a day, 7 days a week and will attempt to locate the contaminated food source and identify other persons who may have been exposed. Any individuals suspected to have been exposed to botulinum toxin should be carefully monitored for evidence of respiratory compromise.

Decontamination of patients / environment
Contamination with botulinum toxin does not place persons at risk for dermal exposure or risk associated with re-aerosolization. Therefore, decontamination of patients is not required.

Prophylaxis and post-exposure immunization
Trivalent botulinum antitoxin is available by contacting state health departments or by contacting CDC: (404) 639-2206 during office hours, (404) 639-2888 after hours. This horse serum product has a <9% percent rate of hypersensitivity reactions. Skin testing should be performed according to the package insert prior to administration.

Triage and management of large scale exposures / potential exposures
Patients affected by botulinum toxin are at risk for respiratory dysfunction that may necessitate mechanical ventilation. Ventilatory support is required, on average, for 2 to 3 months before neuromuscular recovery allows unassisted breathing. Large-scale exposures to botulinum toxin may overwhelm an institution’s available resources for mechanical ventilation. Sources of auxiliary support and means to transport patients to auxiliary sites, if necessary should be planned in advance with coordination among neighboring facilities.
**Plague**

**DESCRIPTION OF AGENT / SYNDROME**

**Etiology**

Plague is an acute bacterial disease caused by a gram-negative bacillus *Yersinia pestis*, which is usually transmitted by infected fleas, resulting in lymphatic and blood infections (bubonic and septicemia plague). A bioterrorism-related outbreak may be expected to be airborne, causing a pulmonary variant, pneumonic plague.

**Clinical features**

Clinical features of pneumonic plague include:

- Fever, cough, chest pain, dyspnea.
- Hemoptysis.
- Muco-purulent or watery sputum with gram-negative rods on gram stain.
- Nausea, vomiting, abdominal pain and diarrhea.
- Radiographic evidence of bronchopneumonia.

**Modes of transmission**

The spore form of *B. anthracis* is durable. As a bioterrorism agent, it could be delivered as an aerosol. The modes of transmission for anthrax include:

- Plague is normally transmitted from an infected rodent to man by infected fleas.
- Bioterrorism-related outbreaks are likely to be transmitted through dispersion of an aerosol.
- Person-to-person transmission of pneumonic plague is possible via large aerosol droplets.

**Incubation period**

The incubation period for plague is normally 2 – 8 days if due to fleaborne transmission. The incubation period may be shorter for pulmonary exposure (most often 2-4 days, range 1-6 days).

**Period of communicability**

Patients with pneumonic plague may have coughs productive of infectious droplets. Droplet Precautions, including the use of a mask for patient care, should be implemented until the patient has completed 72 hours of antimicrobial therapy.

**INFECTION CONTROL PRACTICES FOR PATIENT MANAGEMENT**

For pneumonic plague, Droplet Precautions should be used in addition to Universal Precautions.

- Droplet Precautions are used for patients known or suspected to be infected with microorganisms transmitted by large droplets, generally larger than 5μ in size, that can be generated by the infected patient during coughing, sneezing, talking, or during respiratory-care procedures.
- For pneumonic plague, Droplet Precautions require healthcare providers and others to wear a surgical-type mask when entering the room of a patient on Droplet Precautions.

**Patient placement**

Patient placement recommendations for Droplet Precautions include:

- Placing infected patient in a private room.
- Cohort symptomatic patients with similar symptoms and the same presumptive diagnosis (i.e. pneumonic plague) when private rooms are not available.
- Maintaining spatial separation of at least 3 feet between infected patients and others when cohorting is not achievable.
- Avoid placement of patient requiring Droplet Precautions in the same room with an immuno-compromised patient. Special air handling is not necessary and doors may remain open.

**Patient transport**

- Limit the movement and transport of patients on Droplet Precautions to essential medical purposes only.
- Minimize dispersal of droplets by placing a surgical-type mask on the patient when transport is necessary.

**Cleaning, disinfection, and sterilization of equipment and environment**

Principles of Universal Precautions should be generally applied to the management of patient-care equipment and for environmental control.
Discharge management
Generally, patients with pneumonic plague would not be discharged from a healthcare facility until no longer infectious (completion of 72 hours of antimicrobial therapy) and would require no special discharge instructions. In the event of a large bioterrorism exposure with patients receiving care in their homes, home care providers should be taught to use Universal and Droplet Precautions for all patient care.

Post-mortem care
Universal Precautions and Droplet Precautions should be used for post-mortem care.

TREATMENT
Treatment should be initiated promptly after all specimens for gram-stain and culture have been obtained (See Table). (5)

<table>
<thead>
<tr>
<th>Table 2. Working Group Recommendations for Treatment of Patients With Pneumonic Plague in the Contained and Mass Casualty Settings and for Postexposure Prophylaxis*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Category</td>
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<tr>
<td>Adults</td>
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<td>Children</td>
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<td>Pregnant women</td>
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</tbody>
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Mass Casualty Setting and Postexposure Prophylaxis#

| Patient Category | Recommended Therapy |
| Adults | Doxycycline, 100 mg orally twice daily†† |
| | Ciprofloxacin, 500 mg orally twice daily‡ |
| | Chloramphenicol, 25 mg/kg orally 4 times daily§** |
| Children | Doxycycline, †† |
| | If ≥45 kg, give adult dosage |
| | If <45 kg, then give 2.2 mg/kg orally twice daily |
| | Ciprofloxacin, 20 mg/kg orally twice daily |
| Pregnant women | Doxycycline, 100 mg orally twice daily†† |
| | Ciprofloxacin, 500 mg orally twice daily |
| | Chloramphenicol, 25 mg/kg orally 4 times daily§** |

*These are consensus recommendations of the Working Group on civilian biodefense and are not necessary to be approved by the Food and Drug Administration. See “Therapy” section for explanations. One antimicrobial agent should be selected. Therapy should be continued for 10 days. Oral therapy should be substituted when patient’s condition improves. IM indicates intramuscularly; IV intravenously. †Antimicrobials must be adjusted according to renal function. Evidence suggests that gentamicin, 5 mg/kg IM or IV once daily, would be efficacious in children, although this is not yet widely accepted in clinical practice. Neonates up to 1 week of age and premature infants should receive gentamicin, 2.5 mg/kg IV twice daily. #Other fluoroquinolones can be substituted at doses appropriate for age. Ciprofloxacin dosage should not exceed 4 g/day in children. §Concentration should be maintained between 5 and 20 µg/mL. Concentrations greater than 25 µg/mL can cause reversible bone marrow suppression. ††Refer to “Management of Special Groups” for details in children, ciprofloxacin dose should not exceed 4 g/day. Children younger than 2 years should not receive chloramphenicol. **Children younger than 2 years should not receive chloramphenicol. Oral formulation available only outside the United States. †††Tetracycline should be substituted for doxycycline.

Prophylaxis should continue for 7 days after last known or suspected Y. pestis exposure, or until exposure has been excluded. Facilities should ensure that policies are in place to identify and manage health care workers exposed to...
infectious patients. In general, maintenance of accurate occupational health records will facilitate identification, contact, assessment, and delivery of post-exposure care to potentially exposed healthcare workers.

**Triage and management of large scale exposures / potential exposures**
Advance planning should include identification of sources for appropriate masks to facilitate adherence to Droplet Precautions for potentially large numbers of patients and staff. Instruction and reiteration of requirements for Droplet Precautions (as opposed to Airborne Precautions) will be necessary to promote compliance and minimize fear and panic related to an aerosol exposure.

Advance planning should also include identification of:
- Sources of bulk prophylactic antibiotics and planning for acquisition on short notice.
- Locations, personnel needs and protocols for administering prophylactic post-exposure care to large numbers of potentially exposed individuals.
- Means for providing telephone follow-up information and other public communications services.

**LABORATORY SUPPORT AND CONFIRMATION**
Laboratory confirmation of plague is by standard microbiologic culture, but slow growth and misidentification in automated systems are likely to delay diagnosis. For decisions regarding obtaining and processing diagnostic specimens, contact state laboratory authorities or CDC.

**a. Diagnostic samples**
Diagnostic samples to obtain include:
- Serum for capsular antigen testing.
- Blood cultures.
- Sputum or tracheal aspirates for Gram’s, Wayson’s, and fluorescent antibody staining.
- Sputum or tracheal aspirates for culture.

**b. Laboratory selection**
Handling of clinical specimens should be coordinated with local and state health departments, and undertaken in Bio-Safety Level (BSL) -2 or -3 laboratories. The FBI will coordinate collection of evidence and delivery of forensic specimens to FBI or Department of Defense laboratories.

**c. Transport requirements**
Specimen packaging and transport must be coordinated with local and state health departments, and the FBI. A chain of custody document should accompany the specimen from the moment of collection. For specific instructions, contact the Bioterrorism Emergency Number at the CDC Emergency Response Office, 770/488-7100. Advance planning may include identification of appropriate packaging materials and transport media in collaboration with the clinical laboratory at individual facilities.

**POST-EXPOSURE MANAGEMENT**

**a. Decontamination of patients / environment**
The risk for re-aerosolization of Y. pestis from the contaminated clothing of exposed persons is low. In situations where there may have been gross exposure to Y. pestis, decontamination of skin and potentially contaminated fomites (e.g. clothing or environmental surfaces) may be considered to reduce the risk for cutaneous or bubonic forms of the disease. The plan for decontaminating patients may include:
- Instructing patients to remove contaminated clothing and storing in labeled, plastic bags.
- Handling clothing minimally to avoid agitation. Instructing patients to shower thoroughly with soap and water (and providing assistance if necessary).
- Instructing personnel regarding Universal Precautions and wearing appropriate barriers (e.g. gloves, gown, face shield) when handling contaminated clothing or other contaminated fomites.
- Performing environmental surface decontamination using a hospital-grade disinfectant.

**Prophylaxis**
Post-exposure prophylaxis should be initiated following confirmed or suspected bioterrorism Y. pestis exposure, and for post-exposure management of healthcare workers and others who had unprotected face-to-face contact with symptomatic patients (See Table 4). (5)
PATIENT, VISITOR AND PUBLIC INFORMATION

Fact sheets for distribution will be prepared, including a clear description of Droplet Precautions, symptoms of plague, and instructions to report for evaluation and care if such symptoms are recognized. The difference between prophylactic antimicrobial therapy and treatment of an actual infection will be clarified. Decontamination by showering thoroughly with soap and water can be recommended.
Smallpox
DESCRIPTION OF AGENT / SYNDROME

Etiology
Smallpox is an acute viral illness caused by the variola virus. Smallpox is a bioterrorism threat due to its potential to cause severe morbidity in a nonimmune population and because it can be transmitted via the airborne route. A single case is considered a public health emergency. (8)

Clinical features
Onset of disease is manifested by high fever, malaise, prostration and headache and backache. Skin lesions appear, quickly progressing from macules to papules to vesicles. Ulcerative lesions appear in the mouth and pharynx.

- Crust begins to form on the skin lesions about 8-9 days after onset.
- The rash is synchronous in onset and involves face and extremities (including palms and soles) more than the trunk.

Mode of transmission
Smallpox is transmitted via both large and small respiratory droplets. Patient-to-patient transmission is likely from airborne and droplet exposure, and by contact with skin lesions or secretions. Patients are considered more infectious if coughing or if they have a hemorrhagic form of smallpox.

Incubation period
The incubation period for smallpox is 7-17 days; the average is 12-14 days.

Period of communicability
Unlike varicella, which is contagious before the rash is apparent, patients with smallpox become infectious at the onset of the rash and remain infectious until their scabs separate (approximately 3 weeks).

Emergency Medical Services
Emergency Medical Personnel will be trained to recognize signs and symptoms of smallpox. If a patient is suspected of having smallpox, dispatch will send the patient to the East End entrance of the Rebecca Sealy Hospital. An Emergency Department will be established in this area.

When Rebecca Sealy Hospital is activated as a smallpox hospital, Psychiatry inpatients in that hospital will be promptly moved to a pre-designated area in the John Sealy Towers.

Emergency Room in Rebecca Sealy
The East End Clinic in Rebecca Sealy will become the location for patients who are suspected or diagnosed with smallpox. All triage will be done in this area. Patients will be admitted to an ICU area if necessary or sent to an area designated for patients suspected of having smallpox or an area for patients confirmed to have smallpox.

- In the event that a patient is taken to the main UTMB ER and inadvertent exposures occur, the healthcare workers and exposed patients will be vaccinated. All will be informed about the signs and symptoms of smallpox and allowed to return to daily life.
- Employees will be asked to cover their smallpox vaccination area with a dressing and wear clothing that covers the site during work hours.

Pharmacy
The pharmacy will invoke the Pharmacy Action Plan. When smallpox vaccine arrives from CDC, it will be stocked, reconstituted and dispensed by the Pharmacy. All other supportive medicines for smallpox patients are readily available.

Hospital Employees
Hospital employees, Medical, Nursing, and Respiratory Therapy, students, and all other employees in various healthcare disciplines will be formed into patient care teams. All team members will be vaccinated against smallpox. Healthcare workers will be assigned to shifts with smallpox patients and not enter the main hospital during the shift. Team members will be asked to wear scrubs, issued upon arrival to work, and asked to remove the scrubs and shower before leaving for the day. After they shower, they may enter the main hospital facility. All “team” members will be asked to record
their temperature once a day while working with the smallpox patients and for three weeks after the last contact with smallpox patients or their environment.

**INFECTION CONTROL PRACTICES FOR PATIENT MANAGEMENT**

**Isolation Precautions**
For patients with suspected or confirmed smallpox, both Airborne and Modified Contact Precautions should be used in addition to Universal Precautions.

- Airborne Precautions are used for patients known or suspected to be infected with microorganisms transmitted by airborne droplet nuclei (small particle residue, 5Åμ or smaller in size) of evaporated droplets containing microorganisms that can remain suspended in air and can be widely dispersed by air currents.
- Airborne Precautions require healthcare providers and others to wear a powered air-purifying respirator (PAPR) when entering the patient room.
- Modified Contact Precautions will be used in addition to Airborne Precautions. Gloves, gowns and goggles will be used to enter the room even if direct contact with the patient is not anticipated.

**Patient linens, medication, and supplies**
Access to the Rebecca Sealy Hospital will be restricted to the designated medical teams. Linens, medication, and nourishment will be delivered to the west end of the building by UTMB employees and left in the lobby. A “team member” will deliver the supplies to the necessary location. Phone and computer access will be available.

**Patient transport**
Patient transport will be severely restricted. A portable ICU will be created if necessary and the Rebecca Sealy OR will be available if needed. Patients will wear an N-100 mask while being transported within the building.

**Cleaning, disinfection, and sterilization of equipment and environment**
A component of Modified Contact Precautions is careful management of potentially contaminated equipment and environmental surfaces.

- Items will be autoclaved or disposed of, if possible. Laundry/linens/gowns must be autoclaved before being taken to the laundry. Heavily contaminated laundry should be rinsed before autoclaving.
- All food will be delivered on disposable trays. Used items will be red bagged.
- All waste from Rebecca Sealy Hospital will be placed in Red Bags and incinerated.
- Waste and linens will be removed from the facility via the Rebecca Sealy loading dock. UTMB employees removing the items will wear gloves, N-100 masks and waterproof gowns.
- When possible, noncritical patient care equipment should be dedicated to a single patient (or cohort of patients with smallpox).
- If use of common items is unavoidable, all contaminated, reusable equipment should not be used for the care of another patient until it has been appropriately cleaned and reprocessed.

**Discharge management**
In general, patients with smallpox will not be discharged until it is determined that they are no longer infectious. Patients are no longer infectious after all of their crusts have fallen off.

**Post-mortem care**
Airborne and Modified Contact Precautions should be used for post-mortem care. Bodies will be stored in the Rebecca Sealy Mortuary. The Galveston County Health District will provide directions for cremation. Family visitation will not be allowed.

**LABORATORY SUPPORT AND CONFIRMATION**

**Laboratory selection**
Clinical virology specimens may be sent to the UTMB Clinical Lab who in-turn will send the specimen to the CDC, and USAMRIID. Testing can be performed only in BSL - 4 laboratories. The FBI will coordinate collection of evidence and delivery of forensic specimens to FBI or Department of Defense laboratories.

**Transport requirements**
Specimen packaging and transport must be coordinated with local and state health departments, and the FBI. A chain of
custody document should accompany the specimen from the moment of collection. For specific instructions, contact the Bioterrorism Emergency Number at the CDC Emergency Response Office, 770/488-7100. Advance planning may include identification of appropriate packaging materials and transport media in collaboration with the clinical laboratory at individual facilities.

**Patient, Visitor, and Public Information**
Fact sheets for distribution will be available, including a clear description of symptoms and where to report for evaluation and care if such symptoms are recognized. Details about the type and duration of isolation will be included. Vaccination information that details who should receive the vaccine and possible side effects will also be provided.

**POST-EXPOSURE MANAGEMENT**

**Decontamination of patients / environment**
- Patient decontamination after exposure to smallpox is not indicated.
- Items potentially contaminated by infectious lesions should be handled using Modified Contact Precautions.
- The hospital grade disinfectants already in use in UTMB Hospitals will be effective for disinfection of surfaces contaminated with the smallpox virus.

**Prophylaxis and post-exposure immunization**
Recommendations for prophylaxis are subject to change. Up-to-date recommendations should be obtained in consultation with local and state health departments and CDC. Post-exposure immunization with smallpox vaccine (vaccinia virus) is available and effective. Vaccination alone is recommended if given within 3 days of exposure. Passive immunization is also available in the form of vaccinia immune-globulin (VIG) (0.6ml/kg IM). If greater than 3 days has elapsed since exposure, both vaccination and VIG are recommended.

VIG is maintained at USAMRIID, 301/619-2833. Vaccination is generally contraindicated in pregnant women, and persons with immunosuppression, HIV-infection, and eczema, who are at risk for disseminated vaccinia disease. However, the risk of smallpox vaccination should be weighed against the likelihood for developing smallpox following a known exposure. VIG should be given concomitantly with vaccination in these patients. Following prophylactic care, exposed individuals should be instructed to monitor themselves for development of flu-like symptoms or rash during the incubation period (i.e., for 7 to 17 days after exposure) and immediately report to designated care sites selected to minimize the risk of exposure to others.

Facilities should ensure that policies are in place to identify and manage healthcare workers exposed to infectious patients. In general, maintenance of accurate occupational health records will facilitate identification, contact, assessment, and delivery of post-exposure care to potentially exposed healthcare workers.

**Triage and management of large scale exposures / potential exposures**
Regardless of the number of patients who present to UTMB with smallpox, all patients will be cared for in the Rebecca Sealy Hospital. If the number of patients exceeds the patient care area on 3A-D, clinic space may be used. An ER/Triage area will be setup in the clinic space at the east end entrance. The OR/PACU space may be used for ICU care.
**Tularemia**

**DESCRIPTION OF AGENT / SYNDROME**

**Etiology**
Tularemia is an acute bacterial disease caused by a gram-negative bacillus *Francisella tularensis* which is transmitted by contact with infectious animal tissues and fluids, ingestion of contaminated water, food or soil, bites by infective anthropods and inhalation of infective aerosols. The six classic forms of tularemia are ulceroglandular, glandular, oculoglandular, pharyngeal, typhoidal and pneumonic. A bioterrorism-related outbreak may be expected to be airborne, causing pneumonic tularemia.

**Clinical Features**
Clinical features of pneumonic tularemia include:
- Fever, cough, pleuritic chest pain.
- Minimal sputum production.
- Substernal tightness.
- Hemoptysis may occur but is uncommon.
- Radiographic findings include subsegmental or lobar infiltrates, hilar adenopathy and pleural effusion.

**Modes of transmission**
- Tularemia is usually transmitted by contact with infective animal tissues, by bites of infective anthropods or by inhalation of infective aerosols.
- Bioterrorism-related outbreaks are likely to be transmitted through dispersion of an aerosol.
- There is no evidence for person-to-person transmission of tularemia.

**Incubation period**
The incubation period for pneumonic tularemia is usually 3 to 5 days with a range of 1 to 14 days.

**INFECTION CONTROL PRACTICES FOR PATIENT MANAGEMENT**

**Isolation precautions**
Universal Precautions are used for the care of patients with pneumonic tularemia.

**Patient placement**
Private room placement for patients with tularemia is not necessary. Airborne transmission of tularemia between patients does not occur.

**Patient transport**
Universal Precautions should be used for transport and movement of patients with tularemia.

**Cleaning, disinfection, and sterilization of equipment and environment**
Principles of Universal Precautions should be generally applied for the management of patient-care equipment and for environmental control.

**Discharge management**
No special discharge instructions are indicated. Home care providers should be taught to use Universal Precautions for all patient care.

**Post-mortem care**
Universal Precautions should be used for post-mortem care.

**TREATMENT**
Whenever possible, consultation with an Infectious Diseases Specialist is recommended. See Tables 1 and 2 for treatment and prophylaxis.
Table 1
Recommendations for Treatment of Patients with Tularemia in a Contained Casualty Setting*

<table>
<thead>
<tr>
<th>Contained Casualty Recommended Therapy</th>
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<tbody>
<tr>
<td><strong>Adults</strong></td>
</tr>
<tr>
<td>Preferred choices</td>
</tr>
<tr>
<td>Streptomycin, 1 g IM twice daily</td>
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<tr>
<td>Gentamicin, 5 mg/kg IM or IV once daily</td>
</tr>
<tr>
<td><strong>Alternative choices</strong></td>
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<tr>
<td>Doxycycline, 100 mg IV twice daily</td>
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<tr>
<td>Chloramphenicol, 15 mg/kg IV 4 times daily</td>
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<tr>
<td>Ciprofloxacin, 400 mg IV twice daily</td>
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<tr>
<td><strong>Children</strong></td>
</tr>
<tr>
<td>Preferred choices</td>
</tr>
<tr>
<td>Streptomycin, 15 mg/kg IM twice daily (should not exceed 2 g/d)</td>
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<tr>
<td>Gentamicin, 2.5 mg/kg IM or IV 3 times daily</td>
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<tr>
<td><strong>Alternative choices</strong></td>
</tr>
<tr>
<td>Doxycycline; if weight ≥ 45 kg, 100 mg IV twice daily; if weight &lt; 45 kg, give 2.2 mg/kg IV twice daily</td>
</tr>
<tr>
<td>Chloramphenicol, 15 mg/kg IV 4 times daily</td>
</tr>
<tr>
<td>Ciprofloxacin, 15 mg/kg IV twice daily</td>
</tr>
<tr>
<td><strong>Pregnant Women</strong></td>
</tr>
<tr>
<td>Preferred choices</td>
</tr>
<tr>
<td>Gentamicin, 5 mg/kg IM or IV once daily</td>
</tr>
<tr>
<td>Streptomycin, 1 g IM twice daily</td>
</tr>
<tr>
<td><strong>Alternative choices</strong></td>
</tr>
<tr>
<td>Doxycycline, 100 mg IV twice daily</td>
</tr>
<tr>
<td>Ciprofloxacin, 400 mg IV twice daily</td>
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</tbody>
</table>

*Treatment with streptomycin, gentamicin, or ciprofloxacin should be continued for 10 days; treatment with doxycycline or chloramphenicol should be continued for 14-21 days. Persons beginning treatment with intramuscular (IM) or intravenous (IV) doxycycline, ciprofloxacin, or chloramphenicol can switch to oral antibiotic administration when clinically indicated.
- Not a US Food and Drug Administration-approved use.
- Ciprofloxacin dosage should not exceed 1 g/d in children.

Table 2
Recommendations for Treatment of Patients with Tularemia in a Mass Casualty Setting and for Postexposure Prophylaxis*

<table>
<thead>
<tr>
<th>Mass Casualty Recommended Therapy</th>
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<tr>
<td><strong>Adults</strong></td>
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<tr>
<td>Preferred choices</td>
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<tr>
<td>Doxycycline; if &gt; or = 45 kg, give 100 mg orally twice daily; if &lt; 45 kg, give 2.2 mg/kg orally twice daily</td>
</tr>
<tr>
<td>Ciprofloxacin, 15 mg/kg orally twice daily</td>
</tr>
<tr>
<td><strong>Pregnant Women</strong></td>
</tr>
<tr>
<td>Preferred choices</td>
</tr>
<tr>
<td>Ciprofloxacin, 500 mg orally twice daily</td>
</tr>
<tr>
<td>Doxycycline, 100 mg orally twice daily</td>
</tr>
</tbody>
</table>

*One antibiotic, appropriate for patient age, should be chosen from among alternatives. The duration of all recommended therapies in Table 6 is 14 days.
Not a US Food and Drug Administration-approved use.
Ciprofloxacin dosage should not exceed 1 g/d in children.
LABORATORY SUPPORT AND CONFIRMATION
Diagnosis of tularemia is confirmed by aerobic culture performed in a BSL-2 laboratory.

Diagnostic samples
Diagnostic samples to obtain for culture include:
- Sputum
- Pharyngeal washings
- Fasting gastric aspirates
- Pleural fluid
- Blood

Laboratory selection
Handling of clinical specimens should be coordinated with local and state health departments, and undertaken in BSL-2 or 3 laboratories. The FBI will help coordinate collection of evidence and delivery of forensic specimens to FBI or Department of Defense laboratories.

Transport requirements
Specimen packaging and transport must be coordinated with local and state health departments, and the FBI. A chain of custody document should accompany the specimen from the moment of collection. For specific instructions, contact the Bioterrorism Emergency Number at the CDC Emergency Response Office, 770/488-7100. Advance planning may include identification of appropriate packaging materials and transport media in collaboration with the clinical laboratory at individual facilities.

PATIENT, VISITOR AND PUBLIC INFORMATION
Fact sheets for distribution will be prepared, including a clear description of the symptoms of tularemia, and instructions to report for evaluation and care if such symptoms are recognized. The difference between prophylactic antimicrobial therapy and treatment of an actual infection will be clarified. Decontamination by showering thoroughly with soap and water will be recommended.
References

English JF, Cundiff MY, Malone JD, Pfeiffer JA, Bell M, Steele L, Miller JM. Bioterrorism readiness plan: A template for healthcare facilities. Association for Professionals in Infection Control and Epidemiology and the Centers for Disease Control and Prevention, 1999.


