



## Introduction

The following treatment guidelines have been developed by the Illinois Poison Center (IPC), the Illinois Chapter of the American Academy of Pediatrics and the Illinois Department of Public Health (IDPH). In all cases of suspected bioterrorism activity, immediately notify your local department of public health and IDPH. If you suspect a poisoning exposure from any of the following agents, call the IPC at 1-800-222-1222.



### Pediatric-Specific Information

There is pediatric-specific information contained in several of the guidelines. These sections are noted by the Emergency Medical Services for Children logo (the teddy bear seen at left); the information also is italicized.

These guidelines were developed to assist in familiarizing health care providers with early recognition, reporting and treatment for a broad range of biological, chemical and nuclear events. Patients may require none, some or all of the recommendations described in this document. These guidelines should not be construed to prohibit such flexibility.



## How to Recognize the Epidemiological Signs of a Potential Bioterrorism Event

**Look for the following clues that may suggest a bioterrorism event has occurred:**

- An unusual increase or clustering of patients presenting with unexplained illness and any of the following:
  - Sepsis
  - Pneumonia
  - Flacid muscle paralysis
  - GI illness
  - Bleeding disorders
  - Severe flu-like illness
  - Rash
  - Encephalitis/meningitis
- An unusual or impossible pathogen for your region in a patient without a travel history to an endemic area (e.g., a case of plague in a patient that does not live in, or has not traveled to, the southwest region of the U.S.).
- An unusual temporal and/or geographical clustering of illness (example: persons who attended the same public event or gathering).
- Simultaneous disease outbreaks in human and animal populations.

### Agent Characteristics

	Transmit person to person	Incubation period	Lethality (approx case fatality rate)
Inhalational Anthrax	No	Usually 1-7 days; may be over 43 days in rare cases	45-90%
Botulism	No	12-72 hours	<10% with ventilation support
Brucellosis	Rare	5 days-6 months	<5% untreated
Cholera	Rare	4 hrs -5 days	Low with treatment, high without (50%)
Glanders	Low	10-14 days	>50%
Pneumonic Plague	High	Adults: 1-6 days Peds: 3-4 days	High unless treated in 12-24 hours (~ 60%)
Q Fever	Rare	10-40 days	Very low
Ricin	No	ARDS can start 12-24 hrs; death within 36-48 hrs	High
Smallpox	Moderate to high	7-17 days	Variola Major: ~ 30% Variola Minor: ~ 1%
Staph Enterotoxin B	No	3-12 hrs	<1% (depends on dose)
T-2 Mycotoxins	No	2-4 hrs	Moderate (depends on dose)
Pneumonic Tularemia	No	3-5 days; range 1-14 days	Moderate if untreated (30-60%)
Venezuelan Equine Encephalitis	No	1-6 days for VEE; 4-15 days for WEE and EEE	<1%
Viral Hemorrhagic Fevers	Moderate	2-21 days	Depends on virus; Low-90%

Source: Centers for the Study of Bioterrorism & Emerging Infections 3/02

**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.**



## Clinical Guidance Regarding Testing and Prophylaxis for Anthrax

### **Asymptomatic patient WITHOUT credible exposure or risk**

- Provide reassurance about rarity of infection without known exposure.
- No screening test is available.
- Nasopharyngeal swabs and blood cultures should NOT be used.

### **Asymptomatic patient WITH credible exposure**

*No screening tests are available for diagnosing of anthrax in asymptomatic patients.*

- Conduct individual risk assessment (responsibility of investigative team).
- Environmental samples may be collected to determine risk to patient (must be approved by CDC and/or investigators prior to collection).
- If within 12-24 hrs and/or if they have not showered or changed their clothing since time of exposure, direct patient to change clothing and shower with soap and water ASAP (place clothes in bag or sealed container).
- Provide post-exposure prophylaxis as soon as possible after exposure is known or suspected and continue for 60 days or until exposure is ruled out.

## CUTANEOUS ANTHRAX

### Background:

Causative organism is *Bacillus anthracis*, an encapsulated, aerobic, gram-positive spore-forming rod-shaped bacterium. Humans become infected by ingestion 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 about 7 days post exposure with a range of 1 to 12 days.



### Signs/Symptoms:

- 1) May have localized itching initially
- 2) Usually 7 days post exposure, a painless papule will develop, which may resemble an insect or spider bite
- 3) Within 1 to 2 days, the papule will enlarge and develop a central vesicle with surrounding non-pitting edema
- 4) About 7 to 10 days after the initial papule formation, a **painless** central black eschar will have formed

### Laboratory and Diagnostic Testing:

Call the local department of public health and IDPH to inform the state of a possible anthrax exposure and to obtain additional instructions before testing.

Testing for cutaneous anthrax may include:

- 1) Swab exudates for gram stain and culture:
  - a) If vesicles are present, soak two dry, sterile synthetic-tipped swabs (e.g., dacron or rayon) in vesicular fluid from previously unopened vesicle.
  - b) If eschar is present, lift edge of eschar and rotate two swabs beneath the eschar without removing the eschar.
  - c) If no vesicle or eschar is present, swab the base of the ulcer with sterile, moist synthetic swabs.
- 2) Punch biopsy (full thickness) of lesion for histology, immunochemistry and polymerase chain reaction (PCR) tests. A second sterile specimen may be obtained for gram stain and culture if indicated.
- 3) 5 ml red-top tube for anthrax serology testing;  2 ml for pediatrics
- 4) 5 ml purple-top tube for PCR testing for CDC;  2 ml for pediatrics
- 5) Blood cultures from febrile or hospitalized patients

It is important to have diagnostic testing done before starting antibiotic treatment. Obtain specimens for culture **before** initiating antimicrobial therapy.

### Treatment:

Standard isolation from contact with skin lesions.

(see tables, next page)



**Table 1:**

Treatment of cutaneous anthrax in patients **without** systemic signs, extensive edema or lesions located on head and neck. If any of the preceding occurs, go to Table 2.

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*

\*Previous treatment guidelines for cutaneous 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.

**Table 2:**

Treatment of cutaneous anthrax in patients **with** systemic signs, extensive edema or lesions on the head and neck.

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> <b>or</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.

## GASTROINTESTINAL ANTHRAX

### Background:

Causative organism is *Bacillus anthracis*, an encapsulated, aerobic, gram-positive spore-forming rod-shaped bacterium. Humans become infected by ingestion 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 about 7 days after exposure to spores, with a range of 1 to 12 days.

### Signs/Symptoms:

- 1) Nausea, anorexia, vomiting and fever progressing to severe abdominal pain, bloody emesis and diarrhea (usually bloody)
- 2) Acute abdominal pain with peritoneal signs may develop
- 3) About 2 to 4 days after onset of symptoms, ascites may develop as abdominal pain decreases
- 4) Shock and death 2 to 5 days after onset of symptoms



5) *The case-fatality rate for pediatrics is estimated to be between 25 percent and 60 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) Ascitic fluid: gram-positive bacilli on gram stain of unspun fluid
- 4) Pharyngeal swab: if symptoms/ulcers present (dacron or rayon swabs)
- 5) CT Scan: mesenteric adenopathy may be present
- 6) CXR: widened mediastinum may be present

### Treatment:

Standard isolation from contact with skin lesions.

*(see tables, next page)*

**Table 1:**

<b>Category</b>	<b>Initial Therapy (Oral)</b>	<b>Duration</b>
Adults (including pregnant women and pregnant adolescents)	Ciprofloxacin 400 mg IV every 12 hrs <i>or</i> Doxycycline 100 mg IV every 12 hrs <i>and</i> 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) <i>or</i> Doxycycline: >8 yrs and >45 kg: 100 mg every 12 hrs <i>and</i> One or two additional antimicrobials* All other children: 2.2 mg/kg every 12 hrs <i>and</i> 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.

\*\*Previous treatment guidelines for gastrointestinal 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.**

## 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 <i>or</i> Doxycycline 100 mg IV every 12 hrs <i>and</i> 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) <i>or</i> Doxycycline: >8 yrs and >45 kg: 100 mg every 12 hrs <i>and</i> One or two additional antimicrobials* All other children: 2.2 mg/kg every 12 hrs <i>and</i> 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 <i>or</i> Doxycycline 100 mg BID	60 days*
Children	Ciprofloxacin 10-15 mg/kg every 12 hrs (not to exceed 1 g/day) <i>or</i> 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 ≥ 20 kg 500 mg PO every 8 hrs < 20 kg 40mg/kg PO in 3 doses every 8 hrs
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.**

## OROPHARYNGEAL ANTHRAX


### Background:

Causative organism is *Bacillus anthracis*, an encapsulated, aerobic, gram-positive spore-forming rod-shaped bacterium. Humans become infected by exposure to spores from infected animals (e.g., sheep, goats or cattle), animal products, such as hides or hair, or intentional malicious acts of bioterrorism. The oropharyngeal form of anthrax is extremely rare. 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 exposure to spores; germination may be prolonged for up to two months.

### Signs/Symptoms:

- 1) Fever and marked unilateral or bilateral neck swelling caused by regional lymphadenopathy
- 2) Severe dysphagia (  *oropharyngeal pain in pediatrics*)
- 3) Ulcers at base of tongue which initially may be edematous or hyperemic
- 4) Ulcers may progress to necrosis
- 5) There may be airway compromise from increased swelling

### 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) Pharyngeal swab for culture (Dacron or rayon swabs)

*(see tables, next page)*

**Treatment:**

**Table 1:**

<b>Category</b>	<b>Initial Therapy (Oral)</b>	<b>Duration</b>
Adults (including pregnant women and pregnant adolescents)	Ciprofloxacin 400 mg IV every 12 hrs <i>or</i> Doxycycline 100 mg IV every 12 hrs <i>and</i> 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) <i>or</i> Doxycycline: >8 yrs and >45 kg: 100 mg every 12 hrs <i>and</i> One or two additional antimicrobials* All other children: 2.2 mg/kg every 12 hrs <i>and</i> 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

Treatment of oropharyngeal anthrax in patients *with* systemic signs, extensive edema or lesions on the head and neck.

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

\*\*Previous treatment guidelines for oropharyngeal 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.***

## BOTULISM

### Background:

Botulinum toxin is a neurotoxin produced by *Clostridium botulinum*, an anaerobic gram-positive bacillus, and is the most potent toxin known to humans with an estimated lethal dose of one ng/kg. The toxin inhibits release of acetylcholine and can produce a profound flaccid paralysis. Death usually results from hypoxia secondary to respiratory muscle paralysis. In 1999, infant botulism was the most common form reported to the CDC, followed by wound botulism; food-borne botulism was the least commonly reported. Inhalational exposure to botulinum toxin also is possible, but was not reported to the CDC during that time period. A bioterrorist incident may involve food-borne exposure, but inhalational exposure is the most likely form of exposure in a malicious attack. Botulism cannot be transmitted from person to person.

### Incubation Period:


- 1) Infant botulism: The incubation period is 2 to 4 weeks.
- 2) Food-borne exposure: GI tract symptoms usually occur first, beginning 18 to 36 hours after ingestion (range 2 hours to 8 days). Neurologic symptoms may develop 12 to 36 hours after ingestion, with the cranial nerves usually affected first.
- 3) Wound botulism: The incubation period is 4 to 14 days. Neurologic symptoms may occur hours after exposure.
- 4) Inhalational exposure: Neurologic symptoms may occur 24 to 72 hours after aerosol exposure.

### Signs/Symptoms:

- 1) Infant: Onset ranges from insidious to abrupt. First signs of the illness are in the cranial nerves. The weakness increases over 1 to 4 days. Generalized hypotonia, listlessness, lethargy and poor feeding soon ensue. Descending paralysis is symmetrical. The typical patient has an expressionless face, feeble cry and poor head control. The gag, suck and swallow reflexes are impaired, as well as the corneal reflex, if tested repetitively.
- 2) Food borne: Nausea and vomiting seen early in the course of the disease followed by symmetrical cranial neuropathies (e.g., ptosis, diplopia, blurred vision, mydriasis, sore throat, dysphagia, dysphonia) and descending weakness and paralysis, including involvement of respiratory muscles with respiratory distress leading to respiratory failure. Patients typically are afebrile and do not have an altered level of consciousness.
- 3) Wound: Same as food-borne but without the GI symptoms.
- 4) Inhalational: Same as food-borne but without the GI symptoms.

### Laboratory and Diagnostic Testing:

Call the local department of public health and IDPH immediately to inform the state of a possible botulism exposure and to obtain additional instructions before testing. Routine laboratory tests are of limited value.

- 1) Testing available at CDC, and state and municipal public health laboratories
- 2) Draw 5 ml (  2 ml for pediatrics) in red top tube, also send samples of stool, gastric aspirate and vomitus
- 3) Obtain samples before antitoxin is administered

(continued, next page)



4) *Monitor vital capacity and maintain > 12 ml/kg for pediatrics*


**Treatment:**

Supportive care, including respiratory support and botulinum antitoxin, are the basics of therapy for poisoned individuals.

Your local department of public health and IDPH must be informed immediately as soon as the diagnosis is suspected. The antitoxin is available only from the CDC; IDPH can help coordinate delivery of the antitoxin. **The CDC recommends that only one 10 ml vial of the trivalent antitoxin be administered to poisoned patients.**

## BUBONIC PLAGUE

### Background:

Plague is caused by *Yersinia pestis*, a naturally occurring pathogen with a long history of profound impact on human life. When the disease occurs from natural infections, it is usually associated with poor sanitary conditions, overcrowding and rodents affected by fleas which bite both humans and rodents. As a biological weapon, plague can potentially be distributed by aerosol of *Y. pestis* or by airborne dispersion of fleas infected with plague. It is assumed that a modern biological attack would involve such a scenario. The ensuing outbreak would be almost entirely pneumonic plague.  *Approximately 60 percent of reported cases occur in individuals younger than 20 years.*

### Clinical syndromes of plague include:

- 1) **Bubonic Plague** - characteristic buboes in the femoral area, groin, axillary or cervical lymph nodes
- 2) **Septicemic Plague** - occurs as a primary disease or secondary to bubonic plague with purpura, DIC and necrosis (perhaps the "Black Plague" of medieval times)
- 3) **Pneumonic Plague** - primarily from inhalation of aerosols
- 4) **Plague Meningitis** - found mainly in children
- 5) **Pharyngeal Plague** - asymptomatic carriers occur in contacts of plague patients
- 6) **Cutaneous Plague** - ulcer or pustule at inoculation site from flea bite

### Incubation Period:

Adults: Usually 1 to 8 days after exposure to pathogen

 *Pediatrics: Usually 3 to 4 days, with a range of several hours to 10 days*

### Signs/Symptoms:

- 1) Initial presenting symptoms are non-specific and may include sudden high fever, chills, headache, malaise, nausea, vomiting, mental status changes, abdominal pain, cough or chest pain.
- 2) Bubo formation will occur several hours after onset of initial symptoms. Buboes are large, erythematous, tender lymph nodes and most commonly present in the femoral region, followed by inguinal, axillary and then cervical lesions in descending order of frequency. A bubo may be aspirated for diagnostic purposes and to relieve pain and swelling. A bubo should not undergo incision and drainage because of the infectious potential of the contained material and resultant draining wound.
- 3) Later findings of septicemic plague may be seen with purpura, DIC and acral necrosis of digits and nose.
- 4) Respiratory symptoms from secondary or primary pneumonic involvement may be seen.

### Laboratory and Diagnostic Testing:

Call the local department of public health and IDPH to inform the state of a possible plague-infected patient and to obtain additional instructions for testing, treatment and isolation. Specimen collection should occur before the administration of antibiotics.

- 1) CXR may show non-specific bilateral infiltrates or consolidation if respiratory symptoms are present.
- 2) CSF specimens are needed if meningeal symptoms are present.
- 3) Obtain multiple blood cultures from different sites 10 to 30 minutes apart.
- 4) Aspirated material from affected bubo should be sent for culture and microscopic examination (for adults only).
- 5) Sputum and throat specimens for microscopy for specialized stains (gram negative bacilli on Wright, Giemsa or Wayson stains) and fluorescent antibody tests.

*(continued, next page)*

**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.**

**BUBONIC PLAGUE, p.2**

- 6) Skin scraping of cutaneous lesions (for adults only).
- 7) Tracheal/bronchial washings may be necessary as an inpatient.
- 8) Serum for serologic testing to include *Yersinia pestis* F1 antigen and antibody to F1 antigen.  
Acute and recovery phase will be needed.

**Treatment:**

Infected patients with respiratory signs and symptoms should be kept in isolation. Health care workers should wear masks because of the potential of transmission of concomitant pneumonic plague by aerosolized droplets.

**Recommended Therapy for a Contained Casualty Setting** – One antimicrobial agent should be selected. Therapy should be continued for 10 days.

<p><b>Adults: Preferred Choices</b> Streptomycin: 1 g IM twice daily <i>or</i> Gentamicin: 5 mg/kg IM or IV once daily or 2 mg/kg loading dose followed by 1.7 mg/kg IM or IV 3 times daily</p>	<p><i>Alternative Choices</i> Doxycycline: 100 mg IV twice daily or 200 mg IV once daily <i>or</i> Ciprofloxacin: 400 mg IV twice daily <i>or</i> Chloramphenicol: 25 mg/kg IV 4 times daily</p>
<p><b>Children: Preferred Choices</b> Streptomycin: 15 mg/kg IM twice daily (maximum daily dose, 2 g) <i>or</i> Gentamicin: 2.5 mg/kg IM or IV 3 times daily</p>	<p><i>Alternative Choices</i> Doxycycline: If ≥45 kg, use adult dosage If &lt;45 kg, 2.2 mg/kg IV twice daily (maximum, 200 mg/d) <i>or</i> Chloramphenicol: 25 mg/kg IV 4 times daily <i>or</i> Ciprofloxacin: 15 mg/kg IV twice daily (max dose 1 gm/day)</p>
<p><b>Pregnant women and adolescents:</b> <i>Preferred Choices</i> Gentamicin: 5 mg/kg IM or IV once daily or 2 mg/kg loading dose followed by 1.7 mg/kg IM or IV 3 times daily</p>	<p><i>Alternative Choices</i> Doxycycline: 100 mg IV twice daily (for adults and adolescents) <i>or</i> 200 mg IV once daily (for adults only) Ciprofloxacin: 400 mg IV twice daily</p>
<p><b>Immunocompromised individuals:</b> <i>Preferred Choices</i> Same as non-immunocompromised individuals</p>	<p><i>Alternative Choices</i> Same as non-immunocompromised individuals</p>

**Mass Casualty Setting and Post-Exposure Prophylaxis** – Duration of treatment of plague in mass casualty setting is 10 days. Duration of post-exposure prophylaxis to prevent plague infection is 7 days.

<p><b>Adults: Preferred Choices</b> Doxycycline: 100 mg orally twice daily Ciprofloxacin: 500 mg orally twice daily</p>	<p><i>Alternative Choices</i> Chloramphenicol: 25 mg/kg orally 4 times daily</p>
<p><b>Children: Preferred Choices</b> Doxycycline: If ≥45 kg, use adult dosage If &lt;45 kg, 2.2 mg/kg orally twice daily Ciprofloxacin: 20 mg/kg orally twice daily (max dose 1 gm/day)</p>	<p><i>Alternative Choices</i> Chloramphenicol: 25 mg/kg orally 4 times daily</p>
<p><b>Pregnant women and adolescents:</b> <i>Preferred Choices</i> Doxycycline: 100 mg orally twice daily Ciprofloxacin: 500 mg orally twice daily (max dose for adolescents 1 gm/day)</p>	<p><i>Alternative Choices</i> Chloramphenicol: 25 mg/kg orally 4 times daily</p>

**Precautions:** Droplet isolation is necessary. Standard respiratory droplet precautions (gown, gloves and eye protection). Large number of affected patients may be cohorted. Patients being transported should wear a mask.

Consensus recommendations of the Working Group on Civilian Biodefense, JAMA, June 6, 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.**

## PNEUMONIC PLAGUE

### Background:

Plague is caused by *Yersinia pestis*, a naturally occurring pathogen with a long history of profound impact on human life. When the disease occurs from natural infections, it is usually associated with poor sanitary conditions, overcrowding and rodents affected by fleas which bite both humans and rodents. As a biological weapon, plague can potentially be distributed by aerosol of *Y. pestis* or by airborne dispersion of fleas infected with plague. It is assumed that a modern biological attack would involve such a scenario. The ensuing outbreak would be almost entirely pneumonic plague.

### Clinical syndromes of plague include:

- 1) **Bubonic Plague** - characteristic buboes in the femoral area, groin, axillary or cervical lymph nodes
- 2) **Septicemic Plague** - occurs as a primary disease or secondary to bubonic plague with purpura, DIC and necrosis (perhaps the "Black Plague" of medieval times)
- 3) **Pneumonic Plague** - primarily from inhalation of aerosols
- 4) **Plague Meningitis** - found mainly in children
- 5) **Pharyngeal Plague** - asymptomatic carriers occur in contacts of plague patients
- 6) **Cutaneous Plague** - ulcer or pustule at inoculation site from flea bite

### Incubation Period:

Adults: Usually 1 to 6 days after exposure to pathogen after an aerosolized exposure



*Pediatrics: Usually 3 to 4 days, with a range of several hours to 10 days*

### Signs/Symptoms:

- 1) Patients primarily manifest fever and respiratory symptoms, including cough, hemoptysis and chest pain. Tachypnea, dyspnea and cyanosis may be present. Early hemoptysis is an important clue in differentiating plague from other inhaled agents of bioterrorism.
- 2) Thin, watery, blood-tinged sputum becomes frankly bloody and mucopurulent as the disease rapidly progresses (suggesting plague).
- 3) Plague bacillus can be cultured from sputum, and disease transmission is thought to occur up to 2 meters from a coughing patient.
- 4) Sepsis, shock and multi-organ failure; purpura and necrotic digits in advanced cases.
- 5) Gastrointestinal symptoms common (e.g., nausea, vomiting, abdominal pain and diarrhea). Patients may have a fulminant course with high mortality.

### Laboratory and Diagnostic Testing:

Call the local department of public health and IDPH to inform the state of a possible plague-infected patient and to obtain additional instructions for testing, treatment and isolation. Specimen collection should occur before the administration of antibiotics.

- 1) CXR may show bilateral infiltrates or consolidation.
- 2) CSF specimens are needed if meningeal symptoms are present.
- 3) Multiple blood cultures from different sites 10 to 30 minutes apart.
- 4) Sputum and throat specimens for microscopy for specialized stains (gram negative bacilli on Wright, Giemsa or Wayson stains) and fluorescent antibody tests.

*(continued, next page)*

- 5) Tracheal/bronchial washings may be necessary as an inpatient.
- 6) Serum for serologic testing to include *Yersinia pestis* F1 antigen and antibody to F1 antigen.  
Acute and recovery phase will be needed.

**Treatment:**

Infected patients should be kept in isolation and health care workers should wear masks because of the potential of transmission of pneumonic plague by aerosolized droplets.

**Recommended Therapy for a Contained Casualty Setting** — One antimicrobial agent should be selected. Therapy should be continued for 10 days.

<p><b>Adults: Preferred Choices</b> Streptomycin: 1 g IM twice daily <b>or</b> Gentamicin: 5 mg/kg IM or IV once daily <b>or</b> 2 mg/kg loading dose followed by 1.7 mg/kg IM or IV 3 times daily</p>	<p><b>Alternative Choices</b> Doxycycline: 100 mg IV twice daily <b>or</b> 200 mg IV once daily <b>or</b> Ciprofloxacin: 400 mg IV twice daily <b>or</b> Chloramphenicol: 25 mg/kg IV 4 times daily</p>
<p><b>Children: Preferred Choices</b> Streptomycin: 15 mg/kg IM twice daily (maximum daily dose, 2 g) <b>or</b> Gentamicin: 2.5 mg/kg IM or IV 3 times daily</p>	<p><b>Alternative Choices</b> Doxycycline: If ≥45 kg, use adult dosage If &lt;45 kg, 2.2 mg/kg IV twice daily (maximum dose 200 mg/d) <b>or</b> Ciprofloxacin: 15 mg/kg IV twice daily <b>or</b> Chloramphenicol: 25 mg/kg IV 4 times daily</p>
<p><b>Pregnant women and adolescents:</b> <i>Preferred Choice</i> Gentamicin: 5 mg/kg IM or IV once daily or 2 mg/kg loading dose followed by 1.7 mg/kg IM or IV 3 times daily</p>	<p><b>Alternative Choices</b> Doxycycline: 100 mg IV twice daily <b>or</b> 200 mg IV once daily <b>or</b> Ciprofloxacin: 400 mg IV twice daily</p>

**Mass Casualty Setting and Post-Exposure Prophylaxis** — Duration of treatment of plague in mass casualty setting is 10 days. Duration of post exposure prophylaxis to prevent plague infection is 7 days.

<p><b>Adults: Preferred Choices</b> Doxycycline: 100 mg orally twice daily <b>or</b> Ciprofloxacin: 500 mg orally twice daily</p>	<p><b>Alternative Choices</b> Chloramphenicol: 25 mg/kg orally 4 times daily</p>
<p><b>Children: Preferred Choices</b> Doxycycline: If ≥45 kg, use adult dosage If &lt;45 kg, 2.2 mg/kg orally twice daily <b>or</b> Ciprofloxacin: 20 mg/kg orally twice daily</p>	<p><b>Alternative Choices</b> Chloramphenicol: 25 mg/kg orally 4 times daily</p>
<p><b>Pregnant women and adolescents:</b> <i>Preferred Choices</i> Doxycycline: 100 mg orally twice daily <b>or</b> Ciprofloxacin: 500 mg orally twice daily</p>	<p><b>Alternative Choices</b> Chloramphenicol: 25 mg/kg orally 4 times daily</p>

## SEPTICEMIC PLAGUE

### Background:


Plague is caused by *Yersinia pestis*, a naturally occurring pathogen with a long history of profound impact on human life. Septicemic plague can occur as a primary infection without buboes or as a secondary process from other forms of plague infection. When the disease occurs from natural infections, it is usually associated with poor sanitary conditions, overcrowding, and rodents affected by fleas which bite both humans and rodents. As a biological weapon, plague can potentially be distributed by aerosol of *Y. pestis* or by airborne dispersion of fleas infected with plague.

### Clinical syndromes of plague include:

- 1) **Bubonic Plague** - characteristic buboes in the femoral area, groin, axillary or cervical lymph nodes
- 2) **Septicemic Plague** - occurs as a primary disease or secondary to bubonic plague with purpura, DIC and necrosis (perhaps the "Black Plague" of medieval times)
- 3) **Pneumonic Plague** - primarily from inhalation of aerosols
- 4) **Plague Meningitis** - found mainly in children
- 5) **Pharyngeal Plague** - asymptomatic carriers occur in contacts of plague patients
- 6) **Cutaneous Plague** - ulcer or pustule at inoculation site from flea bite

### Incubation Period:

Adults: Usually 1 to 8 days after exposure to pathogen

 *Pediatrics: Usually 3 to 4 days, with a range of several hours to 10 days*

### Signs/Symptoms:

- 1) Initial presenting symptoms are non-specific and may include sudden high fever, chills, headache, malaise, nausea, vomiting, mental status changes, abdominal pain, cough or chest pain.
- 2) Purpura, DIC and necrosis; the purpura may be widespread and cover most of the body. Necrosis is usually on digits, extremities and nose.

### Laboratory and Diagnostic Testing:

Call the local department of public health and IDPH to inform the state of a possible plague-infected patient and to obtain additional instructions for testing, treatment and isolation. Specimen collection should occur before the administration of antibiotics.

- 1) CXR may show infiltrates or consolidation if respiratory symptoms are present.
- 2) CSF if meningeal symptoms are present.
- 3) Multiple blood cultures from different sites 10 to 30 minutes apart.
- 4) Material from affected bubo should be sent for culture and microscopic examination.
- 5) Sputum and throat specimens for microscopy for specialized stains (gram negative bacilli on Wright, Giemsa or Wayson stains) and fluorescent antibody tests.
- 6) Skin scraping of cutaneous lesions.
- 7) Tracheal/bronchial washings may be necessary as an inpatient.
- 8) Serum for serologic testing to include *Yersinia pestis* F1 antigen and antibody to F1 antigen. Acute and recovery phase will be needed.

*(continued, next page)*

**Treatment:**

Infected patients with respiratory signs and symptoms should be kept in isolation. Health care workers should wear masks because of the potential of transmission of concomitant pneumonic plague by aerosolized droplets.

**Recommended Therapy for a Contained Casualty Setting** — One antimicrobial agent should be selected. Therapy should be continued for 10 days.

<p><b>Adults: Preferred Choices</b>                  Streptomycin: 1 g IM twice daily <b>or</b>                  Gentamicin: 5 mg/kg IM or IV once daily or 2 mg/kg loading dose followed by 1.7 mg/kg IM or IV 3 times daily</p>	<p><b>Alternative Choices</b>                  Doxycycline: 100 mg IV twice daily or 200 mg IV once daily <b>or</b>                  Ciprofloxacin: 400 mg IV twice daily <b>or</b>                  Chloramphenicol: 25 mg/kg IV 4 times daily</p>
<p><b>Children: Preferred Choices</b>                  Streptomycin: 15 mg/kg IM twice daily (maximum daily dose, 2 g) <b>or</b>                  Gentamicin: 2.5 mg/kg IM or IV 3 times daily</p>	<p><b>Alternative Choices</b>                  Doxycycline:                  If ≥45 kg, use adult dosage                  If &lt;45 kg, 2.2 mg/kg IV twice daily (maximum dose 200 mg/d) <b>or</b>                  Ciprofloxacin: 15 mg/kg IV twice daily <b>or</b>                  Chloramphenicol: 25 mg/kg IV 4 times daily</p>
<p><b>Pregnant women and adolescents:</b>  <b>Preferred Choices</b>                  Gentamicin: 5 mg/kg IM or IV once daily or 2 mg/kg loading dose followed by 1.7 mg/kg IM or IV 3 times daily</p>	<p><b>Alternative Choices</b>                  Doxycycline: 100 mg IV twice daily <b>or</b>                  200 mg IV once daily <b>or</b>                  Ciprofloxacin: 400 mg IV twice daily</p>

**Mass Casualty Setting and Post-Exposure Prophylaxis** — Duration of treatment of plague in mass casualty setting is 10 days. Duration of post-exposure prophylaxis to prevent plague infection is 7 days.

<p><b>Adults: Preferred Choices</b>                  Doxycycline: 100 mg orally twice daily <b>or</b>                  Ciprofloxacin: 500 mg orally twice daily</p>	<p><b>Alternative Choice</b>                  Chloramphenicol: 25 mg/kg orally 4 times daily</p>
<p><b>Children: Preferred Choices</b>                  Doxycycline:                  If ≥45 kg, use adult dosage                  If &lt;45 kg, 2.2 mg/kg orally twice daily <b>or</b>                  Ciprofloxacin: 20 mg/kg orally twice daily</p>	<p><b>Alternative Choice</b>                  Chloramphenicol: 25 mg/kg orally 4 times daily</p>
<p><b>Pregnant women and adolescents:</b>  <b>Preferred Choices</b>                  Doxycycline: 100 mg orally twice daily <b>or</b>                  Ciprofloxacin: 500 mg orally twice daily</p>	<p><b>Alternative Choice</b>                  Chloramphenicol: 25 mg/kg orally 4 times daily</p>

# SMALLPOX

**Background:**

Smallpox is a serious, highly contagious, and sometimes fatal infectious disease. There is no specific treatment for smallpox disease. There are two clinical forms of the disease, Variola major and Variola minor. Variola major is the severe form of smallpox and has a historical case-fatality rate of about 30 percent. Uncommon variations of Variola major, such as flat and hemorrhagic smallpox, are almost always fatal. Hemorrhagic smallpox has a much shorter incubation period and is likely not to be initially recognized as smallpox when presenting to medical care.

**Chart of Incubation Period and Signs/Symptoms:**

Incubation Period (Range: 7 to 17 days) <b>Not contagious</b>	Exposure to the virus is followed by incubation period. Patients do not have any symptoms and may feel fine. This period averages about 12 to 14 days but can range from 7 to 17 days. During this time, patients are not contagious.
Initial Symptoms (Lasts 2 to 4 days) <i>Prodrome</i> <b>Sometimes contagious</b>	The first symptoms include fever, malaise, head and body aches, sometimes vomiting. Fever is usually high (101°F to 104°F). Patients are too sick to carry on normal activities.
Early Rash (Days 1 to 5) <b>Contagious</b>	<p><b>Macular rash</b> appears on the tongue and mouth. Sores develop; break open, spreading virus into the oral cavity.</p> <p>Rash appears on the face and spreads to the arms, legs, hands and feet. The rash spreads to all parts of the body within 24 hours. As the rash appears, fever falls and the patient may feel better.</p> <p>Day three rash becomes <b>papular</b>. By day four, papules become <b>vesicles</b> filled with thick, opaque fluid with a depression in the center that looks like a belly-button (major distinguishing characteristic of smallpox.) At this time fever rises until scabs form.</p>
Pustular Rash (Days 5 to 10) <b>Very contagious</b>	The vesicles become <b>pustules</b> , sharply raised, usually round and firm to the touch. They feel like there is a small round object under the skin; it has been described as if there is a BB pellet embedded under the skin.
Pustules/Scabs (Days 11 to 14) <b>Contagious</b>	The pustules form a crust and then <b>scab</b> . Two weeks after the rash appeared, many of the lesions have scabbed over.
Resolving Scabs (Days 15 to 21) <b>Contagious</b>	The scabs begin to fall off; leaving marks on the skin that eventually become <b>pitted scars</b> . Three weeks after the rash appeared most scabs have fallen off. The patient is contagious until all of the scabs have fallen off.
Scabs resolved (Day 21 and beyond) <b>Not contagious</b>	Scabs fall off. Patient is no longer contagious.
Isolation	Airborne and contact.

*(continued, next page)*

**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.**



**Laboratory and Diagnostic Testing:**

Call the local department of health and IDPH to inform the state of a smallpox-infected patient and to obtain additional instructions for testing, treatment and isolation.

Smallpox infection can be rapidly confirmed in the laboratory by electron microscope examination or PCR testing of vesicular or pustular fluid or scabs.

**Treatment:**

Supportive care, along with antibiotics as indicated for treatment of occasional secondary bacterial infections is the mainstay of treatment. Infected patients should be kept in isolation and health care workers should use isolation precautions because of the potential for transmission of smallpox.

## Differentiating Smallpox From Varicella (Chicken Pox)

	Smallpox	Varicella
<b>Prodrome</b>	High fever (>102° F) and systemic symptoms (prostration, severe headache, backache, abdominal pain, or vomiting) 1-4 days <b>before</b> rash onset	No or mild prodrome before rash onset
<b>Location of First Lesion(s)</b>	Oral mucosa/palate (enanthem); followed by examthem (rash) on face or forearm	Trunk (occasionally face)
<b>Characteristics of Rash</b>	Deep, firm, well-circumscribed pustules; may be confluent or umbilicated	Typically superficial vesicles
	Concentrated on face and distal extremities (centrifugal)	Concentrated on trunk and proximal extremities (+/- face, scalp)
	Lesions in same stage of evolution on any one part of the body	Rash appears in crops so lesions are in different stages of evolution (papules, vesicles, scabs) on any one part of the body
	Lesions on palms and soles (seen in >50% of cases)	Very uncommon for lesions to appear on palms and soles
	Lesions may itch at scabbing stage	Lesions generally intensely itchy
	Lesions evolve from papule ➡ pustule in days	Lesions generally evolve from macules to papules to vesicles to scabs in <24 hours
<b>Duration of Illness</b>	Illness lasts 14-21 days	Illness lasts 4-7 days

## TULAREMIA


### Background:

Tularemia is caused by *Francisella tularensis*, one of the most infective agents known to man, with an exposure of as little as 10 to 50 organisms able to cause disease. If *F. tularensis* is used as a bioweapon, it most likely would be used as an airborne agent with infection via the inhalational route.

### Incubation Period:


Usually 3 to 5 days, with a range of 1 to 14 days.

### Signs/Symptoms:

- 1) Initial presenting symptoms are non-specific and may include sudden high fever, chills, headache, malaise, myalgias, arthralgias and progressive weakness.  *Acute febrile illness, progressing to pharyngitis, bronchiolitis, pneumonitis, pleuritis and lymphadenitis may occur in pediatric patients.* There is little evidence of respiratory disease initially.
- 2) The respiratory component of inhalational tularemia is a slow, indolent course with a dry cough and progressive symptoms over weeks to months with progressive debilitation including sepsis, pneumonia (evidenced by chest pain, dyspnea, bloody sputum) and respiratory failure.

### Laboratory and Diagnostic Testing:

Call the local department of public health and IDPH to inform the state of a possible case of tularemia and to obtain additional instructions for testing and treatment. Specimen collection should occur before the administration of antibiotics.

- 1) CXR may show peribronchial infiltrates, lobar consolidation (may be multilobar), pleural effusions and hilar adenopathy.
- 2) CSF specimens are needed if meningeal symptoms are present.
- 3) Obtain multiple blood cultures from different sites 10 to 30 minutes apart.
- 4) Sputum specimens for microscopy (fluorescent antibody staining or immunohistochemical stains) for specialized cultures.
- 5) Sputum and/or pharyngeal washings for specialized cultures using cysteine-enriched medium.
-  6) *Sputum, tracheobronchial secretions, and blood should be cultured in pediatric patients.*
- 7) Serum for serologic testing to tularemia to compare acute and recovery phases.

### Treatment:

Infected patients do not need isolation as person-to-person spread is not expected with this disease.

*(see tables, next page)*

**Recommended Therapy For A Contained Casualty Setting** — Persons beginning treatment with intramuscular (IM) or intravenous (IV) doxycycline, ciprofloxacin, or chloramphenicol can switch to oral antibiotic administration when clinically indicated.

<p><b>Adults: Preferred Choices</b>                  Streptomycin: 1 g IM twice daily x 10 days <i>or</i>                  Gentamicin: 5 mg/kg IM or IV once daily x 10 days</p>	<p><i>Alternative Choices</i>                  Doxycycline: 100 mg IV twice daily x 14 days <i>or</i>                  Chloramphenicol: 15 mg/kg IV 4 times daily x 14 days <i>or</i>                  Ciprofloxacin: 400 mg IV twice daily x 10 days</p>
<p><b>Children: Preferred Choices</b>                  Streptomycin: 15 mg/kg IM twice daily (should not exceed 2 g/d) x 10 days <i>or</i>                  Gentamicin: 2.5 mg/kg IM or IV 3 times daily x 10 days</p>	<p><i>Alternative Choices</i>                  Doxycycline:                  If weight ≥ 45 kg, 100 mg IV twice daily x 14 to 21 days                  If weight &lt;45 kg, 2.2 mg/kg IV twice daily x 14 to 21 days <i>or</i>                  Chloramphenicol: 15 mg/kg IV 4 times daily x 14 days <i>or</i>                  Ciprofloxacin: 15 mg/kg IV twice daily x 10 days</p>
<p><b>Pregnant women and adolescents: Preferred Choices</b>                  Gentamicin: 5 mg/kg IM or IV once daily x 10 days <i>or</i>                  Streptomycin: 1g IM twice daily x 10 days</p>	<p><i>Alternative Choices</i>                  Doxycycline: 100 mg IV twice daily x 14 to 21 days <i>or</i>                  Ciprofloxacin: 400 mg IV twice daily x 10 days</p>
<p><b>Immunocompromised individuals: Preferred Choices</b>                  Same as non-immunocompromised adults</p>	<p><i>Alternative Choices</i>                  Same as non-immunocompromised adults</p>

**Mass Casualty Setting and Post-Exposure Prophylaxis** — One antibiotic, appropriate for patient age, should be chosen from among alternatives.

<p><b>Adults</b>                  Doxycycline: 100 mg orally twice daily x 14 days <i>or</i>                  Ciprofloxacin: 500 mg orally twice daily x 14 days</p>
<p><b>Children</b>                  Doxycycline: If ≥ 45 kg, 100 mg orally twice daily; If &lt;45 kg, 2.2 mg/kg orally twice daily x 14 to 21 days <i>or</i>                  Ciprofloxacin: 15 mg/kg IV orally twice daily (not to exceed 1 gm/day) x 10 days</p>
<p><b>Pregnant women and adolescents</b>                  Doxycycline: 100 mg orally twice daily x 14 to 21 days <i>or</i>                  Ciprofloxacin: 500 mg orally twice daily x 10 days (maximum dose for adolescents is 1 gm/day)</p>

**Precautions:** Decontamination with 10 percent bleach solution followed by 70 percent alcohol solution for contaminated surfaces. If workers come in contact with powder or liquid aerosol containing tularemia, wash body surfaces and clothing with soap and water.

## VIRAL HEMORRHAGIC FEVER

### Background:

VHFs are diseases caused by viruses of four distinct families: arenaviruses, filoviruses, bunyaviruses and flaviviruses. Some types can cause relatively mild illnesses; many can cause severe, life-threatening disease. Transmission can occur from contact with infected animals and animal body fluids (urine, fecal matter, saliva or other body excretions), arthropod vectors, such as being bitten by infected mosquitoes or ticks, person-to-person transfer from close contact, or body fluid exposure.

### Incubation Period:

Usually ranges from 2 days to 3 weeks, depending on the etiology of the VHF.

### Signs/Symptoms:

- 1) Specific signs and symptoms vary by the type of VHF, but initial signs and symptoms often include: marked fever, fatigue, dizziness, muscle aches, loss of strength and exhaustion.
- 2) Patients with severe cases of VHF often show signs of bleeding under the skin, in internal organs, or from body orifices like the mouth, eyes or ears. Although patients may bleed from many sites around the body, patients rarely die because of blood loss. Severely ill patient cases also may show shock, nervous system malfunction, coma, delirium and seizures. Some types of VHF are associated with renal (kidney) failure.

### Laboratory and Diagnostic Testing:

Definitive diagnosis rests on specific virological techniques. Report all suspected cases of VHFs immediately to the local department of public health, IDPH and the CDC. Call IDPH for instructions and handling of specimens. Specimens that may be requested include:

- 1) Blood cultures
- 2) Viral cultures
- 3) Serology tests (acute and recovery phase)
- 4) Stool — especially if patient has copious diarrhea
- 5) Nasopharyngeal swab in viral transport medium
- 6) CBC, DIC panel as clinically indicated

### Treatment:

Please note: Ribavirin is **NOT** FDA-approved. Ribavirin should be administered to individuals believed to have VHF after a bioterrorist attack, and to those who develop symptoms after a VHF contact with other sick persons. However, if the causative virus is ultimately identified as a Filoviridae or a Flaviviridae, ribavirin will not be useful in those infections and should not be continued.

*(see tables, next page)*

Category	Contained Casualty Setting	Mass Casualty Setting and Post-Exposure Prophylaxis
Adults (including pregnant women)	<i>Ribavirin</i> Loading dose: 30 mg/kg IV once (max dose 2 gm); Then 16 mg/kg IV every 6 hrs x 4 days (max dose 1 gm); Then 8 mg/kg IV every 8 hrs x 6 days (max dose 500 mg)	<i>Ribavirin</i> Loading Dose: 30 mg/kg PO once If > 75 kg, 1,200 mg/day PO in 2 divided doses x 10 days If ≤ 75 kg, 1,000 mg/day PO in divided doses. (400 mg in AM; 600 mg in PM) x 10 days
Children	<i>Ribavirin</i> Loading dose: 30 mg/kg IV (max dose 2 gm); Then 16 mg/kg IV every 6 hrs x 4 days (max dose 1 gm); Followed by 8 mg/kg IV every 8 hrs x 6 days (max dose 500 mg)	<i>Ribavirin</i> Loading Dose: 30 mg/kg PO once; Then 15 mg/kg/day PO in 2 divided doses x 10 days
Pregnant Adolescent	Same as for children	Same as for children
Immunocompromised patients	Same as for non-immunocompromised patients	Same as for non-immunocompromised patients

**Precautions:**

- 1) Isolation (airborne precautions, contact precautions) should be utilized to contain the disease in addition to standard precautions:
  - a) Appropriate barrier precautions during entire hospital stay. Notify clinical and laboratory personnel for appropriate handling of patient and specimens.
  - b) Patients with these symptoms should be placed in a negative-pressure room.
  - c) Face shields and goggles, double gloves, impermeable gowns, leg and shoe coverings should be worn when in contact with patient.
  - d) After patient contact, health care workers should remove gown, leg and shoe coverings, and gloves, and immediately clean their hands. Hands should be clean prior to the removal of facial protective equipment (e.g., personal respirators, face shields and goggles) to minimize exposure of mucous membranes with potentially contaminated hands, and once again after the removal of all personal protective equipment.
  - e) N-95 masks or powered air-purifying respirators, and a negative isolation room with 6-12 air changes per hour, as required by Healthcare Infection Control Practices Advisory Committee standards for airborne precautions.
  - f) Restricted access of nonessential staff and visitors to patient's room, dedicated medical equipment, such as stethoscopes, glucose monitors, and, if available, point-of-care analyzers.
  - g) If patient dies, handling of the body should be minimal. The state health department and CDC should be consulted regarding appropriate precautions.
  - h) Environmental disinfection with an Environmental Protection Agency-registered hospital disinfectant or a 1:100 dilution of household bleach.
- 2) No post exposure vaccine prophylaxis is available with the exception of yellow fever and Argentine hemorrhagic fever.
- 3) Supportive care is the mainstay of therapy.
- 4) Ribavirin, an anti-viral drug, may possibly be effective in treating some individuals exposed to arenaviruses or bunyaviruses.
- 5) Treatment with convalescent-phase plasma has been used with success in some patients with Argentine hemorrhagic fever.

Criteria adapted from the World Health Organization's surveillance standards for Hemorrhagic Fever Syndrome

**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.**

## ALPHAVIRUSES

### (Equine Encephalitides)

#### Background:

Venezuelan equine encephalomyelitis, eastern equine encephalomyelitis and western equine encephalomyelitis (VEE, EEE and WEE) are mosquito-borne viral infections found in North and South America. VEE occurs in many areas of South and Central America, and outbreaks have occurred in North America. EEE occurs primarily along the eastern and gulf coasts of the United States and the case-fatality rate can be as high as 50 to 70 percent. WEE viruses are found primarily west of the Mississippi. Outbreaks occur primarily in the summertime. These alphaviruses are limited in their geographic distribution by the mosquito vector, so finding these viruses outside the endemic areas should arouse suspicion of an intentional release. These viruses are considered highly infectious by aerosol. Because they are stable during storage and can be produced in large amounts, they are considered to be agents that are easily weaponized. Reports of ill horses in the vicinity would suggest a natural epidemic, or the release of an equine encephalitis virus.

#### Signs/Symptoms:

Most infections with these viruses result in nonspecific symptoms of fever, headache and myalgia. Only a fraction of those individuals infected will progress to frank encephalitis. Infants and the elderly are more prone to developing encephalitis.

- 1) CNS: The initial viral prodrome may be followed by confusion and somnolence, which may progress to coma.
  - a) EEE is the most severe of these infections, with high mortality rates and high rates of neurologic sequelae.
  - b) WEE and VEE have lower rates of progression to neurologic symptoms. Peripheral blood counts often reveal a leukopenia in the early stages of illness that can progress to leukocytosis. Cerebrospinal fluid (CSF) protein is elevated, and a lymphocytic pleocytosis is usually present.

It is not known whether aerosol exposure in a BT event would lead to a different pattern of symptoms than the mosquito-borne illness.

#### Laboratory and Diagnostic Testing:

Contact the local department of health and IDPH for additional instructions for possible Alphavirus-infected patients:

- 1) **Viral culture:** The virus may be isolated from blood during the early stages of illness, but viremia has usually resolved by the time symptoms of encephalitis develop. The virus can sometimes be isolated from CSF viral cultures.
- 2) **Immunoassays:** The viral pathogen may be identified by serology testing of the CSF or serum. Virus-specific IgM antibodies can be detected by ELISA. Subsequent testing of convalescent serum may confirm the diagnosis but will not be helpful in initial management. Physicians should attempt to obtain CSF for specialized testing if encephalitis is a diagnostic possibility. Experimental PCR assays have been developed for several viral pathogens and they may become commercially available in the future.

#### Treatment:

There is no specific treatment for these viral encephalitides and treatment is supportive.

*(continued, next page)*

**Prophylaxis:**

- 1) Inactivated vaccines are available for EEE, WEE and VEE. None is in widespread use because of problems with poor immunogenicity and need for multiple doses.
- 2) A live attenuated vaccine is available for VEE but has a high incidence of side effects such as fever, headache and malaise.
- 3) New vaccines using recombinant technology are currently in development.

## BRUCELLOSIS

### **Background:**

Brucellosis is usually a zoonotic disease caused by one of four species of *Brucella*: *B. abortus*, *B. canis*, *B. melitensis* and *B. suis*. The most common route of exposure in the United States is by ingestion of contaminated milk and dairy products. Cutaneous transmission through abrasions is possible. Weaponized *Brucella* species would involve an inhalational exposure.

### **Incubation Period:**

Usually ranges from 5 days to more than 6 months post exposure (usually 5 to 30 days).

### **Signs/Symptoms:**

The clinical features of brucellosis are extremely variable and differ based on which category of infection is present. Categories can be divided into acute, undulant and chronic forms.

- 1) Acute Form (<8 weeks from onset): "flu-like" symptoms including fever, profuse sweating, malaise, anorexia, headache, myalgia and back pain. Neurologic infection and pericarditis or endocarditis may occur in severe cases.
- 2) Undulant Form (<1 year from onset): may display undulant fevers, arthritis and orchiepididymitis in young males.
- 3) Chronic Form (>1 year from onset): symptoms may mimic chronic fatigue syndrome, with episodes of depression.

### **Laboratory and Diagnostic Testing:**

Call the local department of health and IDPH with any suspected *Brucella* exposure and for further diagnostic testing recommendations.

- 1) A serum agglutination test for anti-brucella antibodies is the usual diagnostic method. This test should be repeated two weeks after blood draw.
- 2) Brucellosis can also be diagnosed by blood or bone marrow cultures.

### **Treatment:**

Chemoprophylaxis for the exposed, asymptomatic patient is not recommended. No human vaccine for brucellosis is available.

*(see tables, next page)*



Category	Initial Treatment	Duration
Adults	Doxycycline: 200 mg/day PO q d <b>and</b> Streptomycin: 1 g IM per day <b>or</b> Rifampin: 600 mg PO per day	Doxycycline: 6 weeks Streptomycin: 2 to 3 weeks Rifampin: 6 weeks
Children >8 years	Doxycycline: 2-4 mg/kg/d PO QID or divided BID; not to exceed 200 mg/d <b>and</b> Streptomycin: 1 g IM per day <b>or</b> Rifampin: 15-20 mg/kg/d PO	4 to 6 weeks
Children ≤ 8 years	Trimethoprim-sulfamethoxazole (TMP-SMX): 8-10 mg/kg/d (based on trimethoprim); not to exceed 2 double-strength tab/d <b>and</b> Rifampin: 15-20 mg/kg/d PO	45 days
Children >8 y with meningitis,* endocarditis, or osteomyelitis	Doxycycline: 2-4 mg/kg/d PO QD or divided BID; not to exceed 200 mg/d <b>and</b> Streptomycin: 20 mg/kg/d IM; not to exceed 1 g/d <b>or</b> Gentamicin: 3-5 mg/kg/d IM/IV divided q8h	Doxycycline: 4 to 6 months Streptomycin: 1 to 2 weeks Gentamicin: 1 to 2 months
Children ≤ 8 y with meningitis,* endocarditis, or osteomyelitis	TMP-SMX: 8-10 mg/kg/d PO divided BID (based on TMP component) Rifampin: 15-20 mg/kg/d PO	4 to 6 months
Pregnant adults and adolescents	TMP/SMX: 200 mg/day PO once daily <b>and</b> Streptomycin: 1 g IM per day <b>or</b> Rifampin: 600 mg PO per day	TMP/SMX: 6 weeks Streptomycin: 2 to 3 weeks Rifampin: 6 weeks

\*Use of corticosteroids as adjunctive therapy to antibiotics may be of benefit in culture-proven meningitis.

### Surgical Care:

Surgical intervention may be required to drain pyogenic joint effusions or rare paraspinal abscesses.

Adapted from World Health Organization's guidelines on treatment of Brucellosis.

**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.**

## CLOSTRIDIUM PERFRINGENS TOXINS

### **Background:**

Toxins purified from *Clostridium perfringens* may be used in biochemical warfare. The epsilon toxins are most likely to be delivered as an aerosol, although water-borne disease is conceivable. The epsilon toxins change cell membrane integrity and cause intracellular electrolyte disturbances, which lead to cell dysfunction and death. All suspected or confirmed cases of *clostridium perfringens* must be reported to the local department of public health and the Illinois Department of Public Health (IDPH).

### **Incubation Period:**

Usually 1 to 6 hours post exposure.

### **Signs/Symptoms:**

- 1) Pulmonary: May see respiratory irritation, cough, bronchospasm, with severe cases developing ARDS and respiratory failure.
- 2) Cardiac: Tachycardia and/or hypotension may be seen.
- 3) GI: Nausea, vomiting and diarrhea may potentially be seen with food/water-borne contamination (much like *C. perfringens*-induced food poisoning).
- 4) CNS: The *C. perfringens* epsilon toxin is a potent neurotoxin which can cause vacuoles to form in nerve and brain cells resulting in dysfunction and death. Weakness, dizziness, ataxia, and coma leading to death may occur.
- 5) Pancytopenia may be a late complication of severe exposure with resultant bleeding, bruising and immunosuppression.

### **Treatment:**

No antidote exists for these toxins. Standard supportive care with airway precautions is the mainstay of treatment.

## FOOD-AND WATER-BORNE ILLNESSES


### Background:

Although most agents considered likely to be used for BT would be disseminated by way of aerosol, it also is possible to use food-borne or water-borne agents. The use of these agents is less likely than air-borne agents for a large-scale attack because it is difficult to expose many people. Standard treatment of municipal water supplies would preclude survival of most biological agents. *Salmonella* species, *Shigella dysenteriae*, *Escherichia coli* O157:H7 and *Vibrio cholerae* are all bacterial agents, which could be used to cause food-borne gastroenteritis. *Cryptosporidium parvum* (*C. parvum*) is a protozoal organism that also may be used as a biological agent. All suspected or confirmed cases of food- and water-borne illnesses must be reported to the local department of public health and the Illinois Department of Public Health (IDPH).

### Incubation Period:

Usually 1 to 3 days post exposure.

### Signs/Symptoms:

- 1) GI: These infections generally present as diarrhea and can be associated with nausea, vomiting, fever and abdominal cramps.
  - a) Gastroenteritis caused by *Shigella* often is associated with blood or mucus in the stool.
  - b) Cholera is associated with severe watery diarrhea that can cause death from dehydration within hours.
  - c) *E. coli* O157:H7 is associated with bloody diarrhea.
  - d) *Salmonella* or *Shigella* also can be associated with bloody diarrhea.
  - e) *Salmonella typhi* and *S. paratyphi* can produce a typhoidal syndrome with gradual onset of fever, headache, malaise, myalgias and constipation; diarrhea is uncommon.
  - f) *C. parvum* typically causes watery diarrhea associated with crampy abdominal pain. The incubation period is usually approximately one week but can sometimes extend to several weeks. Illness sometimes can last for many weeks.
- 2) Renal: *E. coli* O157:H7 produces a shiga toxin associated with development of hemolytic uremic syndrome (HUS). HUS is characterized by hemolytic anemia, thrombocytopenia and renal insufficiency. Approximately 6 percent of people with bloody diarrhea caused by *E. coli* O157:H7 develop HUS.  *In children younger than 10 years of age, the rate is higher (approximately 10 percent).* The mortality associated with HUS is 3 to 5 percent.

### Laboratory and Diagnostic Testing:

- 1) Routine stool cultures will identify agents such as *Salmonella* and *Shigella*. Many laboratories do not routinely test for *E. coli* O157:H7, so the laboratory should be notified if this agent is suspected (e.g., if the patient has bloody diarrhea).
- 2) *E. coli* O157:H7 appears as a colorless colony on sorbitol MacConkey agar. These colonies can be tested for O157 antigen using a commercial kit. It also is possible to test stool cultures directly for shiga toxin using a commercial kit.
- 3) *V. cholerae* requires special media to grow, so the laboratory should be notified if cholera is suspected.
- 4) *C. parvum* can be identified with a modified acid-fast stain of stool.

(continued, next page)

**Treatment:**

Treatment of these infections is generally supportive.

- 1) Most infections with *Salmonella* and *Shigella* are self-limited and will resolve without specific treatment within a few days. If patients have severe or persistent symptoms, antimicrobial treatment may reduce the duration and severity of symptoms.
  - a) *Salmonella* is susceptible to quinolones, azithromycin and third-generation cephalosporins. Resistance to Trimethoprim-sulfamethoxazole (TMP/SMX) seems to be increasing and probably should not be used for treatment of salmonella infections.
  - b) *Shigella* is susceptible to quinolones, TMP/SMX and azithromycin.
- 2) *E. coli* O157:H7 infection should not be treated with antimicrobials or antimotility agents because treatment may increase toxin production and thereby increase the risk for HUS.
- 3) Treatment of cholera typically requires large amounts of intravenous fluids and replacement of electrolytes. Oral administration of ciprofloxacin or doxycycline is effective for cholera.
- 4) No antimicrobial agent has proven efficacy for *C. parvum* infection, although paromomycin and azithromycin have been used in AIDS patients with chronic diarrhea caused by this organism.

## GLANDERS

### Background:

Glanders is caused by *Burkholderia mallei*, a gram-negative bacillus. This is a zoonotic disease of horses, mules and donkeys. Human infection has occurred almost exclusively in occupations which have contact with animals or work in laboratories (e.g., veterinarians, equine butchers and pathologists). Glanders has not occurred in the United States since the 1940s. As a bioweapon, it would be dispersed as an aerosol. Glanders can occur from a cutaneous infection, upper respiratory infection and/or pulmonary infection. Human cases may have a combination of all three syndromes.

### Incubation Period:

Usually 10 to 14 days after inhalational exposure of the organism.

### Signs/Symptoms:

- 1) Cutaneous infection: Caused by invasion of abraded or lacerated skin; the patient will have nodules and ulcerations at site of infection. A chronic form of this disease may have lymphangitis with eruptions and ulcers along the lymphatic system. This form may spread to develop the septicemic form.
- 2) Upper respiratory infection: The patient will present with mucopurulent discharge from the oral, nasal and/or conjunctival mucosa. There may be nodules and ulcers on the septum and turbinates. This form may spread to develop the septicemic form.
- 3) Pulmonary infection: Patients will have dyspnea, bronchopneumonia, lobar or segmental pneumonia and necrotizing nodular lesions.
- 4) Septicemic form: This stage begins suddenly with fever, rigors, sweats, myalgias, pleuritic chest pain, photophobia, lacrimation and diarrhea. Physical examination may reveal fever, tachycardia, cervical adenopathy and mild splenomegaly. Blood cultures are usually negative until the patient is extremely ill. Mild leukocytosis with a shift to the left or leukopenia may occur. This form usually is fatal within 7 to 10 days.

### Laboratory and Diagnostic Testing:

Call the local department of health and IDPH to inform the state of a possible glanders-infected patient and to obtain additional instructions for diagnostic testing. Specimen collection should occur before the administration of antibiotics.

- 1) Chest x-ray: Look for miliary nodules (0.5-1.0 cm), small multiple lung abscesses, bronchopneumonia, lobar pneumonia, necrotizing nodular lesions.
- 2) Labs:
  - a) Gram stain of lesion exudates may reveal scant small bacilli with methylene blue stain.
  - b) Blood, sputum or urine culture (may grow rapidly on meat nutrient mediums and other specialized mediums).
  - c) CBC - mild leukocytosis with left shift (and bandemia) may be seen.
  - d) Erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) may be elevated.

### Treatment:

Isolation of infected individuals will be necessary to prevent human-to-human spread. Treatment is based on animal and in vitro studies, as naturally-occurring human disease is so rare. Various isolates may have marked variability in resistance pattern and treatment will need to be amended as necessary.

*(continued, next page)*

**Localized disease without systemic symptoms:**

Can use either:

- 1) Amoxicillin/Clavulanate 60 mg/kg/dose divided TID (for local disease or mild toxicity)  
**or**
- 2) TMP/SMX (Trimethoprim/sulfamethoxazole) with TMP 4 mg/kg/dose and SMX 20 mg/kg/dose divided BID  
**or**
- 3) Tetracycline 40 mg/kg/day divided TID (for adults and children > 8 years old)

The duration of treatment should be 60 to 150 days.

**Localized disease with mild systemic symptoms:**

- 1) Using a combination of two of the above oral regimens is recommended for 30 days, followed by monotherapy with either amoxicillin/clavulanate or TMP/SMX for 60 to 150 days.
- 2) If extra-pulmonary suppurative disease is present, therapy should continue for 6 to 12 months. Surgical drainage of abscesses may be required.

**For severe systemic disease:**

- 1) Ceftazidime IV, 120 mg/kg/day divided TID combined **with**
- 2) TMP/SMX (TMP 8 mg/kg/day and SMX 40 mg/kg/day) divided QID for 2 weeks. This regimen should be followed by 6 months of oral therapy.

Animal models show that doxycycline, rifampin and ciprofloxacin may also be effective in the treatment of glanders.

**Prophylaxis:**

No vaccine exists for glanders. Prophylaxis may be attempted with TMP/SMX, but efficacy of treatment, as well as dose and duration treatment, is unknown.

# Q FEVER


**Background:**

Q fever is a zoonotic disease caused by the bacteria *Coxiella burnetii*, a rickettsial agent. Cattle, sheep and goats are the primary reservoirs in naturally-occurring illness and infection occurs from inhalation of organisms during handling and processing of animals. As a bio-weapon, Q fever would be an incapacitating agent and would not be expected to cause a high percentage of fatalities. Person-to-person transmission is not expected to occur.

**Incubation Period:**

Usually 10 to 40 days

**Signs/Symptoms:**

- 1) One-half of all exposed individuals will be asymptomatic (seroconversion only).
- 2) Acute cases may resemble a flu-like illness or atypical pneumonia and include high fever, severe headache (retro-orbital pain), general malaise, myalgias, confusion, sore throat, chills, sweats, nonproductive cough, nausea, vomiting, diarrhea, abdominal pain and chest pain  (*meningismus in children*).
- 3) The fever may last 1 to 2 weeks.
- 4) Pneumonia may develop in 30 to 50 percent of symptomatic patients.
- 5) Abnormal liver function tests may be seen.
- 6) Most patients recover without treatment.
- 7) Chronic infection is uncommon but may occur with resulting endocarditis.
- 8) Mortality rate is low (1 to 2 percent).

**Laboratory and Diagnostic Testing:**

Call the local department of public health and IDPH with all suspected cases of *Coxiella burnetii* infection. Confirmation is made by specialized antibody testing by ELISA or fluorescent antibody testing.

**Treatment:**

There is not a commercially-available vaccine for Q fever.

Category	Initial Therapy	Duration
Adults	Doxycycline: 100 mg PO, BID <i>or</i> Tetracycline: 500 mg PO, QID <i>Quinilones, chloramphenicol and trimethoprim-sulfamethoxazole also are probably effective</i>	15 to 21 days
Children > 8 years old	Doxycycline: If ≥ 45 kg, 100 mg PO, BID If < 45 kg, 2-5 mg/kg BID (maximum dose 200 mg/d)	15 to 21 days
≤ 8 years old	Co-trimoxazole: 4 mg/kg BID <i>or</i> Chloramphenicol: 12.5 mg/kg PO, BID	15 to 21 days

*(continued, next page)*

Category	Prophylaxis	Duration
Adults	Doxycycline: 100 mg PO, BID <i>or</i> Tetracycline: 500 mg PO, QID	Treat for 5 to 10 days. Treatment may be started 8 to 12 days after exposure. If started prior to this time, onset of illness may be delayed, but not prevented.
Children	Doxycycline: 100 mg PO, BID <i>or</i> Tetracycline: 25-50 mg/kg PO, QID	Treat for 7 to 14 days. Treatment may be started 8 to 12 days after exposure. If started prior to this time, onset of illness may be delayed, but not prevented.

If a patient develops endocarditis, a multiple antibiotic regimen to include a tetracycline is recommended.



## RICIN

### **Background:**

Ricin is manufactured from the castor bean, and can be formed from the waste products of castor oil production or made in clandestine laboratories. It is thought that ricin works by disrupting protein synthesis at the ribosomal level. Fast growing cells will be most affected initially. It can be inhaled in a powder or mist form, ingested if it is put in food or water supply, or injected IM/SQ.

### **Signs/Symptoms:**

- 1) Inhalational Exposure: Symptoms occur a few hours after an inhalational exposure, and may include cough, chest tightness, dyspnea, nausea and myalgias. Severe exposures can develop into pulmonary edema and/or ARDS within 12 to 24 hours.
- 2) Ingestion: Severe gastroenteritis can be seen with ricin toxicity with profound vomiting, severe abdominal pain, cramping and diarrhea. GI bleeding may be noted. Death is from multi-system organ failure.
- 3) Injection: At low doses, IM injection may produce flu-like symptoms, myalgias, nausea, vomiting, and localized pain and swelling. Injection of a lethal amount of ricin will cause local tissue necrosis, massive gastroenteritis, GI bleeding and multi-system organ failure.

Death from ricin poisoning could occur within 36 to 48 hours after exposure. If the patient survives 5 days, they should survive the poisoning.

### **Laboratory and Diagnostic Testing:**

No specific hospital-based laboratory testing is available. Call the local department of health and IDPH for any suspected malicious event involving ricin.

Confirmation of ricin exposure can be made by ELISA analysis of a swab sample from nasal mucosa. Ricin can be identified for up to 24 hours after exposure. Patients may have neutrophilic leukocytosis, hypoxemia, and bilateral infiltrates on chest radiograph.

### **Treatment:**

There is no specific treatment for ricin poisoning. The cornerstone of treatment is basic supportive care including fluids for management of gastroenteritis and airway/pulmonary management for treatment of inhalational exposure. In addition, pressor support may be necessary for patients with hypotension.

## STAPHYLOCOCCAL ENTEROTOXIN B

### Background:

Staphylococcal enterotoxin B (SEB) is part of a family of enterotoxins commonly implicated in food poisoning. SEB has been weaponized in the past and has an estimated effective incapacitating dose (ED<sub>50</sub>) of 0.0004 ug/kg and an estimated LD<sub>50</sub> of 0.02 ug/kg by inhalational route of exposure.

### Incubation Period:

Since this is an inhaled toxin, there is not a true incubation period. The onset of action is estimated to be 3 to 4 hours, after which the victim may be severely incapacitated by illness.

### Signs/Symptoms:

- 1) Constitutional: Fever and myalgias may occur 8 to 20 hours after exposure.
- 2) Pulmonary: Cough, dyspnea, rales, pulmonary edema and pleuritic chest pain may occur 4 to 15 hours after exposure.
- 3) Cardiac: Tachycardia may be seen and closely parallels fever.
- 4) CNS: Headache is a common symptom of a significant exposure.
- 5) GI: Nausea, anorexia and vomiting are common symptoms from inhalational exposure.
- 6) Severe exposures may lead to septic shock and death.

### Laboratory and Diagnostic Testing:

Notify the local department of public health and IDPH of any suspected SEB release and to receive further instructions.

- 1) CXR for possible pulmonary edema, baseline labs
- 2) 12 to 24 hours post exposure, enterotoxin may be identifiable from nasal swabs of affected patients.
- 3) Diagnosis may be confirmed by specialized immunosorbant assays on tissue or body fluid samples. The assays test for the presence of enterotoxin.

### Treatment:

There is no antidote for SEB. Supportive care is the mainstay of treatment.

- 1) Fever: Antipyretics.
- 2) Pulmonary: Standard therapy including oxygen, bronchodilators, diuretics and airway support and control as needed.
- 3) GI: Fluids and anti-emetics as needed.

## ACUTE RADIATION EXPOSURE

### Background:

Radiation injury can be divided into local radiation injury (LRI) and acute radiation syndrome (ARS) from high-dose whole body exposures. ARS is caused by irradiation of the entire body (or most of the body) by a high dose of penetrating radiation (gamma rays, certain x-rays and neutrons) in a very short period of time (usually a matter of minutes). The major cause of this syndrome is depletion of immature parenchymal stem cells in specific tissues. Examples of persons who suffered from ARS are the survivors of the Hiroshima and Nagasaki atomic bombs and the first-response firefighters to the 1986 Chernobyl Nuclear Power Plant event. All suspected or confirmed cases of acute radiation exposure must be reported to the local department of public health and the Illinois Department of Public Health (IDPH).

### Signs/Symptoms:

LRI can cause loss of body hair on exposed parts, erythema, desquamation, blisters and local necrosis. For ARS, there are four distinct stages. There also are three classic ARS syndromes described.

### ARS Stages:

- 1) Prodromal stage (N-V-D stage): The classic symptoms for this stage are nausea, vomiting and possibly diarrhea (depending on dose) that occur from minutes to days following exposure. The symptoms may last (episodically) for minutes up to several days. Symptoms which begin soon after exposure indicate a higher exposure and a poor prognosis of the patient.
- 2) Latent stage: In this stage the patient generally looks and feels healthy for a few hours or even up to a few weeks.
- 3) Manifest illness stage: In this stage, the symptoms depend on the specific syndrome and last from hours up to several months.
- 4) Recovery or death: Most patients who do not recover will die within days to several months after exposure. The recovery process may last from several weeks up to two years.

### ARS Syndromes:

- 1) Bone Marrow Syndrome (also referred to as hematopoietic syndrome): The full syndrome usually will occur with a dose between 0.7 and 10 Gy (70 - 1000 rads) though mild symptoms may occur as low as 0.3 Gy or 30 rads. The survival rate of patients with this syndrome decreases with increasing dose. The primary cause of death is the destruction of the bone marrow, resulting in sepsis and hemorrhage.
- 2) Gastrointestinal (GI) syndrome: The full syndrome usually will occur with a dose between 10 and 100 Gy (1000 - 10,000 rads) though some symptoms may occur as low as 6 Gy or 600 rads. Survival is extremely low with this syndrome. Destructive and irreparable changes in the GI tract and bone marrow usually cause infection, dehydration and electrolyte imbalance. Death usually occurs within 2 weeks.
- 3) Central Nervous System (CNS) syndrome: The full syndrome usually will occur with a dose greater than 50 Gy (5000 rads) though some symptoms may occur as low as 20 Gy or 2000 rads. Patients experience confusion, disorientation, seizures, cerebral edema and coma. Death occurs within 3 days.

### Laboratory and Diagnostic Testing:

- 1) CBC, basic blood chemistries. Monitor CBC (especially the lymphocyte count) every 2 to 3 hours for the first 8 to 12 hours following exposure (and every 4 to 6 hours for the following 2 or 3 days). Prognosis can be determined from Andrew's Curve (see end of guideline).

*(continued, next page)*

**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.**

- 2) Geiger counter: Individuals exposed to ionizing radiation only will not register. Individuals contaminated with radioactive liquids or solids will register with the Geiger counter.


**Treatment:**

Call the Radiation Emergency Assistance Center/Training Site (REAC/TS) at (865) 576-3131 (M-F, 8 am to 4:30 am EST) or (865) 576-1005 (after hours) to record the incident in the Radiation Accident Registry System.

**Decontamination:**

Individuals exposed to ionizing radiation only do not need decontamination. Individuals contaminated with radioactive liquid or solids will need removal of clothes and irrigation. Success of decontamination can be measured with a Geiger counter.

**Antidotal Therapy:**

- 1) Potassium Iodide (KI): KI is used for individuals exposed to radioactive iodine (such as fallout from a nuclear power plant). It is used as prophylaxis to decrease the incidence of thyroid cancer. A one-time dose is usually all that is needed.  *Children are the most susceptible to the dangerous effects of radioactive iodine. The FDA and the World Health Organization (WHO) recommend that children from newborn to 18 years of age take KI unless they have a known allergy to iodine.*

Adults	130 mg tablet
Children ≥ 68 kg	130 mg tablet
Children 3-18 years old < 68 kg	One-half of a 130 mg tablet (65 mg)
Children 1 month to 3 years old	One-quarter of a 130 mg tablet (32 mg)
Infants from birth to one month of age	One eighth of a 130 mg tablet (16 mg)

Breastfeeding women should take the adult dose and their children should take the recommended infant dose.

Taking extra KI will not add extra protection and may cause severe illness or death in cases of allergy. The high concentration of iodine in KI can be harmful to some people. People should not take KI if they:

- a. have ever had thyroid disease (such as hyperthyroidism, thyroid nodules or goiter).
- b. know they are allergic to iodine (if you are allergic to shellfish, ask your doctor or pharmacist about taking KI).
- c. have certain skin disorders (such as dermatitis herpetiformis or urticaria vasculitis).

- 2) Prussian Blue: Used to treat internal contamination with particles of radioactive cesium or thallium. It only is available through REAC/TS. Consult IDPH or the Illinois Poison Center for assistance in procurement of this antidote.

**Supportive Care:**

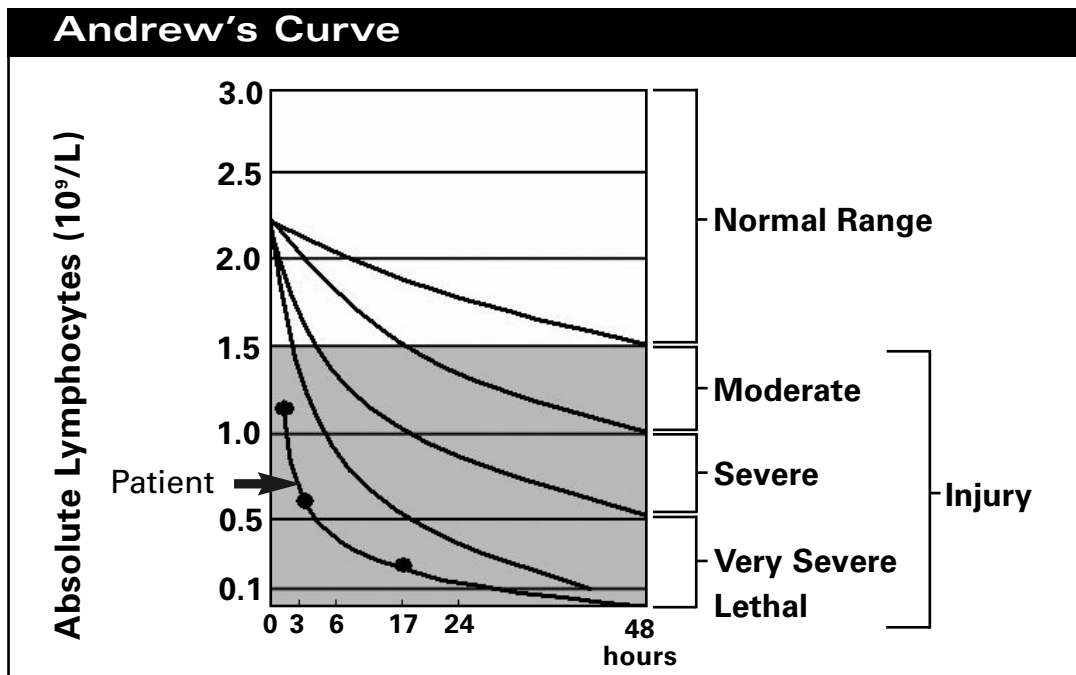
Treat associated traumatic injuries first.

- 1) Treat vomiting with antiemetics and IVF.
- 2) Record all clinical symptoms, particularly nausea, vomiting, diarrhea, and itching, reddening or blistering of the skin (especially the time of onset).
- 3) Consider tissue, blood typing, and initiating prophylaxis for infectious agents if warranted.
- 4) Consult with radiation, hematology and radiotherapy experts in regards to dosimetry, prognosis and treatment options.

*(continued, next page)*

After consultation, consider:

- a) supportive care in a clean environment (e.g., burn unit)
- b) prevention and treatment of infections
- c) stimulation of hematopoiesis by use of growth factors
- d) stem cell transfusions or platelet transfusions (if platelet count is too low)
- e) psychological support
- f) confirmation of initial dose estimate using chromosome aberration cytogenetic bioassay when possible. Though resource intensive, this is the "gold standard" for dose assessment following acute exposures.



## T-2 MYCOTOXIN

### (Trichothecene Mycotoxin)

#### **Background:**

Trichothecene mycotoxin (T-2) may be used to produce morbidity and mortality when dispersed in aerosol form. T-2 also can enter the body through the skin and digestive tract epithelium, without being inhaled, and quickly inhibit protein and nucleic acid synthesis. This toxin may have been used in Laos and Cambodia during the Vietnam War (yellow rain), Afghanistan and during the Iran-Iraq war. Significant T-2 exposure should be considered when multiple patients present with similar clinical syndromes and report exposure to "yellow rain" or if droplets of yellow fluid contaminate clothing or the environment.

#### **Signs/Symptoms:**

##### **Acute symptoms:**

- 1) Skin: Pruritis, redness, vesicles, necrosis, epidermal sloughing
- 2) CNS: Dysesthesias (distortion of any of the senses), ataxia
- 3) GI: Nausea, vomiting and diarrhea
- 4) Airway: Nose and throat pain, nasal discharge, itching and sneezing
- 5) Pulmonary: Cough, dyspnea, wheezing, chest pain and hemoptysis
- 6) Cardiovascular: Severe poisoning can cause weakness, decreased cardiac output, shock and death
- 7) Heme: Bleeding disorders; may develop neutropenia as longer term sequelae

#### **Laboratory and Diagnostic Testing:**

Call the local department of public health and IDPH to inform the state of a possible T-2 exposure(s) and to obtain additional instructions for testing and treatment. Specialized tests utilizing gas-liquid and high pressure liquid chromatography exist for the detection of the toxin.

- 1) Nasal or throat swabs and induced respiratory secretions may be needed for HPLC/GLC/MS and immunoassay.
- 2) Blood for serum may be collected in a tiger-top (SST) or red top tube for toxin assays.
- 3) Urine may be collected with 0.1 ml concentrated hydrochloric acid (HCl) added per 100 ml of urine for recent exposure.
- 4) If several days have elapsed since exposure, a 24-hour urine collection with HCl added may be requested.

*Supportive Tests:* CBC may show a transient leukocytosis. Leukopenia may occur several days after exposure.

#### **Treatment:**

##### **Decontamination:**

Outer clothing should be removed and exposed skin should be decontaminated with soap and water. Eye exposure should be treated with copious saline irrigation. There is no specific treatment for T-2 mycotoxin poisoning.

##### **Supportive Care:**

There is no antidotal therapy available for this toxin. The cornerstone of treatment is basic supportive care including fluids for management of gastroenteritis and insensible skin losses, as well as airway/pulmonary management for treatment of inhalational exposure.

## AMMONIA

### Background:

Ammonia exposures occur from contact with liquefied gas, gas or aqueous solution. Anhydrous ammonia is transported and stored under pressure as liquefied gas but is a gas at room temperature and pressure. Aqueous ammonia solutions range in concentration from 5 percent (household use) to 25 percent or greater (commercial use). When ammonia comes in contact with water, it forms ammonium hydroxide, a potent, alkaline-corrosive solution. Ammonia gas or concentrated solution can cause severe corrosive burns on contact. The extent of injury will be dependent upon the duration of exposure and the ammonia concentration of the gas or liquid.

### Signs/Symptoms:


- 1) Airway: Burning sensation of the mouth, nose and pharynx can occur. Serious exposures (gas or ingestion) can result in swelling of the upper airway and larynx with stridor, muffled voice or aphonia as signs of impending occlusion.
- 2) Pulmonary: Bronchospasm, wheezing, cough
- 3) Cardiovascular: No direct cardiovascular effects; may have secondary effects from hypoxia
- 4) CNS: No direct CNS effects; may have secondary effects from hypoxia
- 5) Dermal: Burning and irritation from concentrated solutions and gases. In addition, frostbite injury from contact from liquefied anhydrous ammonia is possible.
- 6) GI: Severe mucosal, esophageal and intestinal injury possible from ingestion of alkaline-corrosive solution
- 7) Ocular: Burning, irritation and swelling from gas or liquid exposure

### Treatment:

#### Decontamination:

- 1) Skin: Gas exposures usually do not need decontamination. Patients exposed to liquefied gas or large amounts of aqueous solution should have clothing removed and be decontaminated with water for at least five minutes.
- 2) Eyes: For symptomatic exposures, irrigate eyes for 30 minutes with water or saline. Check pH of conjunctiva post irrigation; it should be 7.
- 3) Ingestion:
  - a) Gastric lavage generally not considered
  - b) Activated charcoal usually not considered for alkaline corrosive ingestions
  - c) Consider dilution, initially with a small amount of milk or water

#### Supportive care:

- 1) Support airway as clinically indicated
- 2) Treat bronchospasm with bronchodilators
-  3) Consider racemic epinephrine for pediatric patients with stridor from gas exposures
- 4) GI consult for significant ammonia ingestions
- 5) Ophthalmology consult for symptomatic eye exposures
- 6) Treat burns as clinically indicated

*(continued, next page)*

**Disposition:**

Consider admission for patients with evidence of respiratory abnormalities or distress, significant GI symptoms, or significant dermal burns, as well as those who have ingested concentrated ammonia solution.



## HYDROFLUORIC ACID

### Dermal Exposure

#### Background:

Hydrofluoric acid (HF) is a relatively weak acid because the hydrogen and fluoride create a tightly bound molecule. HF readily penetrates the skin and mucous membranes because of its tight binding (uncharged). In the tissue, the fluoride portion will avidly bind to divalent cations such as calcium and magnesium, causing deep tissue destruction. The deep tissue destruction causes the severe unrelenting pain experienced by affected patients. Severity and timing of effects depends on the concentration, duration of exposure, and penetrability of the exposed tissue; pain may be delayed. Life threatening systemic toxicity may follow dermal exposure with minimal external tissue damage.

#### Incubation Period:

Timing of pain following dermal exposure to HF will vary according to concentration. Generally:

- 1) < 20 percent concentration - erythema and pain may be delayed for 24 hours and often is not reported until significant tissue injury has occurred.
- 2) 20 to 50 percent concentration - erythema and pain may be delayed for 8 hours and often is not reported until tissue injury has occurred.
- 3) >50 percent concentration - may produce immediate pain and erythema, rapid destruction of tissues and acute systemic toxicity.

#### Signs/Symptoms:

- 1) Airway: Upper airway and mucosal irritation may occur from fumes.
- 2) Cardiovascular: Hypocalcemia and hypomagnesemia are associated with prolonged QTc and ventricular dysrhythmias, such as torsades de pointes, ventricular tachycardia and ventricular fibrillation.
- 3) Pulmonary: Dyspnea, bronchospasm chemical pneumonitis, pulmonary edema (possibly hemorrhagic), tracheobronchitis, upper airway obstruction, chemical burns (larynx, trachea and bronchi) and ARDS may occur following severe inhalational exposure.
- 4) Metabolic: Hypocalcemia, hypomagnesemia, hyperkalemia and acidosis.
- 5) Dermal: A hallmark of dermal exposure to low concentrations of HF is pain that is out of proportion to the physical examination. Severe pain may be obvious, while only erythema of the exposed skin is observed. More severe burns may exhibit erythema, central blanching with peripheral erythema, swelling, vesiculation, serous crusting, ulceration, blue-gray discoloration and necrosis.
- 6) Eyes: Pain, conjunctival injection, corneal abrasion and corneal ulceration may be seen initially with a strong liquid exposure. Progressive corneal vascularization, scarring and corneal opacification may occur in a delayed fashion.

#### Laboratory and Diagnostic Testing:

Low concentration exposures or late presenting patients may need pain control and antidotal treatment only. In patients with exposure to higher concentrations, or who are chronically ill or symptomatic, consider a calcium level, magnesium level, chem-7, EKG, and monitoring for dysrhythmias.

*(continued, next page)*

**Treatment:**

**Decontamination:**

Remove all exposed clothing and jewelry and irrigate all exposed areas with copious amounts of water for 30 minutes (acute exposures).

**Enhanced Elimination:**

No methods of enhanced elimination are available for HF burns.

**Antidotal Therapy:**

- 1) Topical calcium and parenteral calcium are the mainstays of treatment of dermal burns.
- 2) Calcium gel: Apply and massage gel into the affected area. Any coagulum that is present must be removed prior to gel application so that the antidote may penetrate the area. There are two methods of making gel in the ED if calcium gluconate or carbonate gel is not available from the pharmacy:
  - a) Calcium gluconate: Add 3.5 grams of calcium gluconate powder to a 5-ounce tube of water-soluble surgical lubricant, such as K-Y Jelly. Calcium chloride is not recommended due to its potential for irritation.
  - b) Calcium carbonate: 32.5 percent slurry used for treatment of hand or finger burns can be prepared by grinding ten (10-grain) tablets into a fine powder and adding to 20 milliliters of a water-soluble lubricant gel, such as K-Y Jelly. Alternatively, calcium carbonate powder can be added to K-Y Jelly until a spreadable gel is produced.
- 3) Local infiltration: Consider local infiltration with calcium gluconate if higher concentration HF exposure results in immediate tissue damage or erythema and pain persist following adequate irrigation. Infiltrate each square centimeter of the affected (painful) skin and subcutaneous tissue with about 0.5 milliliter of 10 percent calcium gluconate using a 30-gauge needle. Repeat as needed to control pain. This procedure is generally not recommended for fingers or toes due to potential for tissue injury from increased pressure (compartment syndrome).
- 4) Intravenous: Regional intravenous infusion of calcium gluconate, using a technique similar to the Bier block, is an option for HF burns of the forearm, hand or digits **and** topical or local infiltration therapy has failed.
  - a) Insert an IV into the dorsum of the affected hand. Exsanguinate the superficial veins by raising the arm for 5 minutes or applying an esmarch bandage. When exsanguination is complete, inflate a blood pressure cuff to just above the systolic blood pressure to prevent the arm from refilling with blood. Lower the arm or remove the bandage. Infuse 10 to 20 mL of 10 percent calcium gluconate solution diluted to 30 to 40 mL with 0.9 percent saline solution. Maintain ischemia 25 to 30 minutes; then sequentially release the blood pressure cuff over 5 minutes. IV therapy is considered successful if there is absence of pain and tenderness during the hour following treatment.
- 5) Intra-arterial infusion: This technique is an option for treatment of digit burns and topical therapy has failed.
  - a) Following satisfactory placement of the arterial line, a dilute preparation of calcium gluconate (10 mL of a 10 percent solution mixed in 40 to 50 mL 5 percent dextrose **or** 20 mL of a 10 percent solution mixed in a 250 cc of 5 percent dextrose) is infused with a pump apparatus into the catheter over 4 hours. If pain recurs in 4 hours, repeat calcium infusion one time. Perform frequent neurovascular checks of the hand during and after the procedure.

*(continued, next page)*

**Supportive Care:**

- 1) Pain control: Administer NSAIDS and narcotics as needed to control pain.
- 2) Electrolytes: Treat hypocalcemia, hypomagnesemia and hyperkalemia as necessary.
- 3) Cardiac effects: Mainly due to the above, treat electrolyte imbalances with calcium gluconate or calcium chloride IV push. Correct hyperkalemia emergently with insulin, dextrose and sodium bicarbonate. Consider administration of magnesium sulfate.

**Disposition:**

Admit patients with high concentration exposures and cardio-respiratory signs/symptoms to the ICU and observe with continuous EKG monitoring.

Patients who need invasive procedures such as arterial administration of calcium gluconate should be admitted to a monitored setting with frequent neurovascular checks.

Patients who have adequate pain control after irrigation and/or antidotal treatment may be discharged home with close follow up.

## HYDROGEN CYANIDE

### Background:

Hydrogen cyanide (HCN) is a pale-blue liquid at 78°F; at higher temperatures it is a colorless gas. It has a 'bitter almond' odor; however, 20 to 40 percent of individuals cannot detect the odor of HCN. Cyanide is well absorbed by inhalation and can cause death within minutes. Substantial absorption can occur through intact skin. Cyanide inhibits cytochrome oxidase and prevents oxidative phosphorylation and ATP production. The inhibition of the cytochrome oxidase increases the need for anaerobic glycolysis and leads to profound acid-base disorders. All suspected or confirmed cases of hydrogen cyanide intoxication must be reported to the local department of public health and the Illinois Department of Public Health (IDHP).

### Signs/Symptoms:

In general, the clinical signs of significant intoxication would be rapid knockdown, bradycardia, hypotension and tachypnea. Diagnostic studies will show a profound metabolic acidosis from elevated lactate.

- 1) CNS: Excitement, dizziness, nausea, vomiting and headache may be noted initially. Severe symptoms may include coma and seizures.
- 2) Cardiovascular: Early findings may include hypertension and tachycardia. Bradycardia and hypotension are more commonly seen and are considered later findings.
- 3) Pulmonary: Dyspnea, chest tightness, tachypnea, progressing to cyanosis and pulmonary edema may occur.
- 4) Metabolic: High anion gap metabolic acidosis secondary to a lactic acidosis.

### Laboratory and Diagnostic Testing:

- 1) Laboratory tests: CBC, Chem-7 (calculate anion gap), ABG, lactic acid, cyanide level
- 2) EKG: monitor (may see dysrhythmias and/or bradycardia)
- 3) CXR (may have pulmonary edema in severe poisoning)
- 4) CT scan if severe neurological effects present and exposure is not definitively confirmed

### Treatment:

#### Decontamination:

Patients who have been exposed to gas only and do not have skin or ocular irritation, do not need decontamination. Patients who have been exposed to cyanide-containing liquid or solution should be decontaminated with water; a mild soap may be used as well but is not essential. Liquid cyanide can off-gas and patients should be decontaminated prior to entry to the hospital.

#### Antidotal Therapy:

Taylor Cyanide Antidote Kit®: Contains three separate components – amyl nitrite perles, sodium nitrite and sodium thiosulfate.

#### Dosing:

##### Amyl Nitrite


- 1) Use if IV access is delayed or not possible
- 2) Crush 1-2 capsules into gauze
- 3) Have patient inhale amyl nitrite through gauze, or place gauze within facemask, over intake valve of bag-valve-mask device or port access to ET tube during assisted ventilation
- 4) Alternate every 30 seconds with 100 percent oxygen
- 5) Discontinue use when IV access obtained and sodium nitrite given. If no IV access within 3 minutes, give second capsule

*(continued, next page)*

**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.**

**Sodium Nitrite**

1) Adult: 300 mg over 5 minutes or more (10 mL of a 3 percent solution)

 2) *Pediatrics: 0.19 to 0.39 mL/kg of a 3 percent solution, or if the hemoglobin is known, use the following pediatric table:*

Hemoglobin (grams)	Sodium Nitrite (mg/kg)	3 Percent Sodium Nitrite Solution (mL/kg)
7.0	5.8	0.19
8.0	6.6	0.22
9.0	7.5	0.25
10.0	8.3	0.27
11.0	9.1	0.30
12.0	10.0	0.33
13.0	10.8	0.36
14.0	11.6	0.39

**Sodium Thiosulfate**

1) Adult: 12.5 g over 10 minutes (50 mL of a 25 percent solution)

 2) *Pediatrics: 1.65 mL/kg of a 25 percent solution*

**Sodium thiosulfate may be considered as a single agent for treatment of cyanide poisoning, especially in suspected cases that have not been confirmed.**

**Adverse Effects:**

**Nitrites**

- 1) Severe methemoglobinemia  $\geq 30$  percent possible
- 2) Hypotension
- 3) Hypernatremia

**Sodium Thiosulfate**

- 1) Hypernatremia
- 2) Sulfa allergic reaction

**Cautions:**

- 1) Check methemoglobin levels 30 minutes after nitrite administration. If levels  $>30$  percent, do not use methylene blue, consider exchange transfusion.
- 2) Nitrite-induced methemoglobinemia may be detrimental in any condition with poor oxygen-carrying capacity (anemia, cardiac disease, lung disease, carbon monoxide poisoning, fire victims).
- 3) Monitor blood pressure and slow infusion rate of sodium nitrite if hypotension develops.
- 4) Asymptomatic patients should not be treated with the entire cyanide antidote kit because of inherent toxicity of nitrite-containing antidotes.

**Supportive Care:**

Monitor and support patient per standard ACLS and emergency medicine practices.

---

**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.**

## METHYL BROMIDE

(Bromomethane, monobromomethane, isobrome and methyl fume)

### Background:

Methyl bromide, a colorless gas at room temperature, is used primarily as a pesticide to fumigate soil, structures and commodities. It usually is shipped as a liquefied, compressed gas. It is odorless and nonirritating at low concentrations and has a musty or fruity odor at high concentrations. Because methyl bromide lacks adequate physiologic warning properties, chloropicrin, a lacrimator, often is added to prevent significant exposure. Methyl bromide is three times heavier than air and can accumulate in poorly ventilated or low-lying areas. All suspected or confirmed cases of methyl bromide intoxication must be reported to the local department of public health and the Illinois Department of Public Health (IDPH).

### Signs/symptoms:

Methyl bromide methylates the sulfhydryl groups of enzymes, causing disruption at the cellular level. It is primarily a neurotoxic gas.

- 1) Skin: High concentrations may cause erythema, pain and blisters. 🧸 *Because of their relatively larger surface area: body-weight ratio, children are more vulnerable to toxicants absorbed through the skin.*
- 2) HEENT: Mucosal irritation and burns of eyes, mouth and nose may occur.
- 3) GI: Nausea, vomiting and diarrhea may occur after exposure. Elevated liver enzymes may be noted.
- 4) Renal: Transient renal insufficiency may occur.
- 5) Pulmonary: Upper respiratory tract irritation, cough and chest tightness may be seen. Prolonged, increased exposure may cause pulmonary edema. Pulmonary edema may be delayed up to 4 to 5 days. 🧸 *Children may be more vulnerable because of relatively increased minute ventilation per kg and failure to evacuate an area promptly when exposed.*
- 6) Cardiovascular: High concentrations may cause tachycardia and hypotension.
- 7) CNS: The most common signs/symptoms of acute intoxication are neurologic and may include dizziness, headache, confusion, lethargy, seizures and coma. Late sequelae of exposure may include organic brain syndrome and extrapyramidal effects.

### Laboratory and Diagnostic Testing:

- 1) Bromide exposures may be used to prove that an exposure occurred, but not to predict clinical outcome
- 2) CBC, Chem-7 and liver function tests
- 3) CXR
- 4) Pulse ox
- 5) Head CT if uncertain that mental status changes are from chemical exposure

### Treatment:


#### Decontamination:

Patients exposed only to methyl bromide gas pose no risk of secondary contamination and need only removal of clothing. Patients whose skin or clothing is contaminated with liquid methyl bromide can secondarily contaminate staff by direct contact or through off-gassing of vapors. These patients must have clothing removed and be decontaminated with soap and water.

*(continued, next page)*

### Supportive Care:

There is no specific antidotal therapy for methyl bromide poisoning. The cornerstone of treatment is basic supportive care.

- 1) IVF: Management of fluid losses from emesis and hypotension.
- 2) Airway/pulmonary: Consider bronchodilators and steroids for wheezing/bronchospasm. Consider racemic epinephrine with patients  (*especially children*) with stridor. Intubate the patient as clinically indicated.
- 3) CNS/Seizures: Attempt initial control with benzodiazepines. If seizures persist or recur, administer phenobarbital. Monitor for respiratory depression, hypotension, dysrhythmias and the need for endotracheal intubation.

## METHYL ISOCYANATE

(isocyanomethane, isocyanatomethane, methylcarbylamine, MIC)

### Background:

Methyl isocyanate (MIC) has multiple uses in the pesticide and plastics industries. It usually is handled and transported as a liquid, which is flammable and explosive. MIC evaporates rapidly in air; the most common route of exposure is inhalational. It has a pungent odor, however, health effects have been reported below the odor threshold; therefore lack of odor is not a reliable indicator of non-exposure. MIC is 1.4 times heavier than air and will 'pool' in low-lying areas. All suspected or confirmed cases of MIC poisoning must be reported to the local department of public health and the Illinois Department of Public Health (IDPH).

### Signs/Symptoms:

- 1) Skin: Irritation, burning sensation, chemical burns.
- 2) HEENT: May cause permanent damage with cataract formation or chronic blepharitis.
- 3) Pulmonary: Low concentrations may produce mild respiratory irritation. High concentrations can cause cough, dyspnea, increase secretions, chest pain, tightness and asthmatic episodes. Pulmonary edema and/or ARDS may develop in some cases.
- 4) CNS: Acute lung injury-induced hypoxia may produce CNS depression.
- 5) GI: GI irritation, vomiting and/or defecation may occur.



*Children exposed to the same levels of MIC as adults may receive larger doses because they have relatively greater lung surface area: body-weight ratios and higher minute volume: weight ratios. In addition, they may be exposed to higher levels than adults in the same location because of their short stature and higher levels of MIC are found nearer to the ground.*

### Laboratory and Diagnostic Testing:


- 1) Routine blood and chemistry tests
- 2) CXR
- 3) Pulse ox
- 4) Consider ABG

### Treatment:

#### Decontamination:

Patients exposed only to MIC gas pose no risk of secondary contamination and need only removal of clothing. Patients whose skin or clothing is contaminated with liquid MIC can secondarily contaminate staff by direct contact or through off-gassing of vapors. These patients must have clothing removed and be decontaminated with soap and water.

#### Supportive Care:

There is no specific antidotal therapy for MIC poisoning. The cornerstone of treatment is basic supportive care including fluids for management of emesis and airway/pulmonary management for treatment of inhalational exposure. Consider bronchodilators and steroids for wheezing/bronchospasm. Consider racemic epinephrine with patients  (especially children) with stridor.



## NERVE AGENTS

(e.g., Sarin, Soman, Tabun, VX)

### Background:

Nerve agents inhibit acetylcholinesterase. When inhibition of acetylcholinesterase occurs, there is a build up of acetylcholine, a neurotransmitter found at the neuromuscular junction and pre-ganglionic synapses in the sympathetic and parasympathetic nervous system. This leads to classic muscarinic, nicotinic and central effects. Muscarinic effects (DUMBBELS) include diarrhea, urination, miosis, bradycardia, bronchorrhea, emesis, lacrimation and salivation. Nicotinic effects (M T W H F) include mydriasis, tachycardia, weakness, hypertension and fasciculations. Central effects may include anxiety, agitation, confusion, seizures and coma. Nerve agent poisoning can occur from ingestion, inhalational or dermal exposure. All suspected or confirmed cases of nerve agent poisoning must be reported to the local department of public health and the Illinois Department of Public Health (IDPH).

### Onset of Action:

- 1) Vapor or gas exposure: Seconds to minutes
- 2) Dermal liquid exposure: Minutes to hours

### Signs/Symptoms:

- 1) Motor: Ranges from diffuse muscle cramping and fasciculations (early) to flaccid paralysis (late)
- 2) Pulmonary: Rales, wheezing, poor inspiration from muscle weakness
- 3) Cardiac: Bradycardia or tachycardia and hypotension or hypertension may be seen
- 4) GI: Nausea, vomiting, diarrhea, abdominal cramping
- 5) GU: Urinary incontinence
- 6) Skin: Diaphoresis
- 7) HEENT: Miosis or rarely mydriasis, tearing of eyes, excessive salivation
- 8) CNS: Confusion, agitation, seizures, coma


### Laboratory and Diagnostic Testing:

Diagnostic tests may include CBC, Chem-7, continuous pulse oximetry, ABG, CXR and an RBC cholinesterase level.

### Treatment:

#### Decontamination:

Generally, gas/vapor exposures only need removal of clothes and jewelry. Seal all articles in impervious plastic bags and save for the authorities. Patients exposed to gas/vapor do not always need dermal decontamination as secondary decontamination is negligible once the clothing is removed. Liquid or unknown exposures **MUST** have universal, thorough decontamination.

- 1) Dermal exposure: Remove all clothes and jewelry. Wash patient with copious amounts of mild soap or bleach and water as per hospital guidelines.  *Soap and water may be preferable for infants and small children.* Use chemical resistant gloves (e.g., neoprene) if possible.
- 2) Ingestion: May consider lavage and charcoal, but copious emesis usually makes gastric decontamination unnecessary and charcoal difficult to administer.
- 3) If a cluster of patients has cholinergic signs from an **unknown** exposure, assume it is a dermal liquid exposure or VX, and thoroughly decontaminate all patients. If it is a **known** exposure to a **gaseous** form of nerve agent, consider abbreviated decontamination by removing clothing only, or using a shorter decontamination period.

(continued, next page)

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.

### Antidotal Therapy:


Antidotal therapy, especially pralidoxime (2-PAM), should be started as soon after exposure as possible to prevent irreversible binding to the acetylcholinesterase enzyme.

- 1) Mark Kits: Each kit contains 600 mg of 2-PAM and 2 mg of atropine
  - a) Initial bolus:
    - a. One Mark 1 kit for mild symptoms such as ambulating, miosis, eye pain, blurred vision, rhinorrhea, mild dyspnea, sweating at exposure site, if dermal exposure
    - b. Two Mark 1 kits for moderate symptoms such as unable to ambulate, nausea, vomiting, wheezing, dyspnea or large scale fasciculations
    - c. Three Mark 1 kits for severe symptoms such as extremis, loss of consciousness, flaccid paralysis, seizures, cardiac or respiratory arrest
  - b) Maintenance: 1 Mark kit injection every hour for three hours

### If Mark kits are unavailable or IV access has been obtained:

#### 1) Atropine:

Adults: Start with 1-2 mg IV (IM without access). Repeat every 5 minutes until tracheobronchial secretions have cleared.


 Pediatrics: Start with 0.05 mg/kg IV (IM without access). Repeat every 5 minutes until there is clearing of tracheobronchial secretions.

**Note:** Tachycardia is not a contraindication to utilization of atropine in these poisonings. Typically, patients with acute organophosphate poisoning who have received atropine should also receive pralidoxime.

#### 2) Pralidoxime (2-PAM)

Adults: Loading Dose: 1-2 gm diluted in 100-150 cc NS infused over 30 minutes.

Maintenance Infusion: Up to 500 mg per hour (maximum of 12 gm/day)


 Pediatrics: Loading Dose: 25-40 mg/kg (maximum one gram) as a 5 percent solution in NS infused over 30 minutes. Maintenance Infusion: 10-20 mg/kg/hr of a 5 percent solution in NS

### Supportive Care:

1) Seizures: Control seizures with benzodiazepines (diazepam or lorazepam). Consider phenobarbital for intractable seizures.

#### a) Diazepam:

Adults: 5 to 10 mg IV, repeat every 5 to 10 minutes prn. Consider a second agent if seizures persist or recur after 30 mg have been administered.

 Pediatrics: 0.2 to 0.5 mg/kg IV, repeat every 5 to 10 minutes prn. Consider a second agent if seizures persist or recur after diazepam 10 mg in children over 5 years or 5 mg in children under 5 years of age.

Rectal Diazepam: If IV access is unavailable, diazepam may be given per rectum (generally use twice the usual initial dose because of decreased absorption). Rectal formulations are available in fixed, unit doses of 5, 10, 15 and 20 mg. Recommended dose is 0.2 to 0.5 mg/kg.

#### b) Lorazepam:


Adults: 2 to 4 mg IV/IM, repeat every 5 to 10 minutes if seizures persist

 Pediatrics: 0.05 to 0.1 mg/kg IV/IM. (Maximum four mg/dose), repeat every 5 to 10 minutes prn.

#### c) Phenobarbital:

Adult: Loading dose: 600 to 1200 mg phenobarbital IV (10 to 20 mg/kg) diluted in NS. Infuse at 25 to 50 mg per minute.

Maintenance dose: Additional doses of 120 to 240 mg may be given every 20 minutes.

 Pediatrics: Loading dose: 15 to 20 mg/kg of phenobarbital, IV infusion at a rate of 25 to 50 milligrams per minute.

Maintenance Dose: Repeat doses of 5 to 10 mg/kg may be given every 20 minutes.

(continued, next page)

**NERVE AGENTS, p.3**

- 2) Airway: Support airway with standard measures. Atropine and bronchodilators for wheezing and bronchospasm.
- 3) Hypotension: Standard supportive measures with IVF boluses and pressors if needed.

## PHOSGENE

### Background:

Phosgene is produced commercially by chlorinating carbon monoxide. It is used as a chemical intermediate in the manufacture of chemicals such as isocyanates, polyurethane, polycarbonates, dyes, pesticides and pharmaceuticals. It also is a by-product of burning or heating most volatile chlorinated compounds such as Freon, certain solvents, dry-cleaning agents and paint removers. Phosgene is a colorless, fuming liquid at 47°F, and is a gas at room temperature. At a low concentration, it may have the odor of newly mown hay; however, the odor threshold is 5 times the OSHA permissible exposure limit (PEL), so detection of odor correlates with a potentially significant exposure. Phosgene is slightly soluble in water and hydrolyzes to hydrochloric acid. Its main toxicity is from inhalation; toxicity is determined by concentration of phosgene in the air and length of exposure. Phosgene is heavier than air and may cause asphyxiation in poorly ventilated, enclosed spaces. All suspected or confirmed cases of phosgene intoxication must be reported to the local department of public health and the Illinois Department of Public Health (IDPH).


### Signs/Symptoms:

- 1) Airway: Upper airway irritation may not be present or may have mild irritation if a large exposure has occurred. Phosgene is a slightly water soluble gas and exerts most of its damage in the lower respiratory tree.
- 2) Pulmonary: Usually asymptomatic initially; however 30 minutes to 72 hours later, patients may develop respiratory problems such as cough, dyspnea, tachypnea progressing to pulmonary edema and ARDS. Patients who survive 48 hours usually survive to discharge. Phosgene exposure also has been associated with chemical-induced asthma.
- 3) Cardiovascular: Instability can be caused by hypoxia and respiratory collapse.
- 4) Dermal: If the skin is wet or moist, may develop irritation and erythema.
- 5) Eyes: Tearing and irritation not uncommon; opacification of the cornea may occur in rare instances.
- 6) GI: May have hepatic and/or renal necrosis from direct phosgene effects on end organs. Nausea and vomiting may be seen post exposure.

### Diagnostic Studies:

- 1) CXR (may show changes consistent with pulmonary edema or ARDS)
- 2) ABG (may show hypoxia, possible hypercarbia)
- 3) Continuous pulse oximetry

### Treatment:

- 1) Decontamination:
  - a) Fluid exposure will need dermal decontamination.
  - b) Gas exposures without eye or skin complaints do not need decontamination.
  - c) For symptomatic ocular exposures, flush eyes for 15 minutes.
- 2) Treat bronchospasm with aerosolized bronchodilators.
- 3) Consider steroids for treatment of pulmonary damage.
-  4) Consider racemic epinephrine for pediatric patients with stridor.
- 5) Support airway as clinically indicated with PEEP in intubated patients and CPAP in non-intubated patients for patients with pulmonary edema or ARDS.

*(continued, next page)*

**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.**

**Disposition:**

Admission and observation should be considered for all patients with a known phosgene exposure for a minimum of 23 hours. All symptomatic patients with signs of pulmonary edema or ARDS should be admitted to the ICU.

# ISOLATION GUIDELINES

<b>Patient Management</b> Negative Pressure Rooms are:  <b>IMPORTANT PHONE NUMBERS</b> Illinois Poison Center 1-800-222-1222 Infection Control _____ - _____ ER _____ - _____ Local Health Department _____ - _____ USAMRIID 301-619-2833 The local health department will notify IDPH.	BACTERIAL AGENTS									VIRUSES				BIOLOGICAL TOXINS			
	Anthrax	Brucellosis	Cholera	Giardiasis	Bubonic Plague	Pneumonic Plague	Tularemia	Q. Fever	Smallpox	Venez. Equine Encephalitis	Viral Encephalitis	Viral Hemorrhagic Fever	Botulism	Ricin	T-2 Mycotoxins	Staph. Enterotoxin B	
Standard Precautions for all aspects of patient care	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Contact Precautions (gown & gloves; wash hands after each patient encounter)			X**	X*	X*				X		X				X*		
Airborne Precautions (negative pressure room & N95 masks for all individuals entering the room)									X		X**						
Droplet Precautions (surgical mask)					X						X**						
<b>Patient Placement</b>																	
No restrictions	X	X	X	X			X	X		X	X		X	X	X	X	
Cohort 'like' patients when private room unavailable			X**	X*	X	X			X		X				X*		
Private Room			X**	X*	X*	X			X		X				X*		
Negative Pressure									X		X**						
Door closed at all times									X		X**						
<b>Patient Transport</b>																	
No restrictions	X	X	X	X	X		X	X		X	X		X	X	X	X	
Limit movement to essential medical purposes only			X**	X*	X*	X			X		X				X*		
Place mask on patient to minimize dispersal of droplets						X			X		X**						
<b>Cleaning and Disinfection</b>																	
Routine cleaning of room with hospital-approved disinfectant	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	
Disinfect surfaces with 10% bleach solution or phenolic disinfectant											X						
Dedicated equipment (disinfect prior to leaving room)			X**	X*	X*				X		X				X*		
Linen management as with all other patients	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	
Linens autoclaved before laundering in hot water with bleach added									X								
<b>Post-mortem Care</b>																	
Follow principles of Standard Precautions	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Droplet Precautions (surgical mask)					X												
Contact Precautions (gown & gloves)				X*	X*				X		X				X*		
Avoid autopsy or use Airborne Precautions & HEPA filter					X				X		X**						
Routine terminal cleaning of room with hospital-approved disinfectant	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	
Disinfect surfaces with 10% bleach solution or phenolic disinfectant											X						
Minimal handling of body; deal body in leak-proof material											X						
Cremate body whenever possible									X								
<b>Discontinuation of Isolation</b>																	
48 hrs. of appropriate antibiotic and clinical improvement					X												
Until all scabs separate									X								
Until skin decontamination completed (1 hr. contact time)															X		
Duration of illness			X**	X*	X*						X						
<b>STANDARD PRECAUTIONS</b> - Standard Precautions prevent direct contact with all body fluids (including blood), secretions, excretions, non-intact skin (including rashes) and mucous membranes. Standard Precautions routinely practiced by healthcare providers include: splash/spray, and gowns to protect skin and clothing during procedures.																	

\* Contact precautions needed only if the patient has skin involvement (bubonic plague: draining bubo) or until decontamination of skin is complete (T-2 Mycotoxins).  
 \*\* A surgical mask and eye protection should be worn if you come within 3 feet of patient. Airborne precautions are needed if patient has cough, vomiting, diarrhea or hemorrhage.  
 \*\*\* Contact precautions needed only if the patient is diapered or incontinent.

**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.**

## Transmission Routes of Potential Bioterrorism Agents

### Inhalational

These agents can be transmitted through the air. It is thought that a bioterrorist attack will most likely involve inhalational exposure.

- |  |   |   |
|--|---|---|
| <ul style="list-style-type: none"> <li># <b>Anthrax</b><br/><i>Bacillus anthracis</i></li> <li># <b>Botulism</b><br/><i>Clostridium botulinum</i> toxin</li> <li># <b>Plague</b><br/><i>Yersinia pestis</i></li> <li># <b>Tularemia</b><br/><i>Francisella tularensis</i></li> </ul> | <ul style="list-style-type: none"> <li># <b>Brucellosis</b><br/><i>Brucella</i> spp.</li> <li># <b>Glanders</b><br/><i>Burkholderia mallei</i></li> <li># <b>Melioidosis</b><br/><i>Burkholderia pseudomallei</i></li> <li># <b>Psittacosis</b><br/><i>Chlamydomphila psittaci</i></li> </ul> | <ul style="list-style-type: none"> <li># <b>Q Fever</b><br/><i>Coxiella burnettii</i></li> <li># <b>Toxins</b><br/><i>Clostridium perfringens</i><br/><i>Ricinus communis</i><br/><i>Staph. aureus</i></li> </ul> |
|--|---|---|

### Vector

These agents can be transmitted by an arthropod vector.

- |   |  |  |
|---|--|--|
| <ul style="list-style-type: none"> <li># <b>Fleas</b> <ul style="list-style-type: none"> <li># <b>Plague</b><br/><i>Yersinia pestis</i></li> </ul> </li> <li># <b>Lice</b> <ul style="list-style-type: none"> <li># <b>Typhus</b><br/><i>Rickettsia prowazekii</i></li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li># <b>Ticks</b> <ul style="list-style-type: none"> <li># <b>Tularemia</b><br/><i>Francisella tularensis</i></li> <li># <b>Q Fever</b><br/><i>Coxiella burnettii</i></li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li># <b>Mosquitoes</b> <ul style="list-style-type: none"> <li># <b>Tularemia</b><br/><i>Francisella tularensis</i></li> <li># <b>Viral encephalitis</b><br/>VEE, EEE, WEE</li> <li># <b>West Nile Fever virus</b></li> <li># <b>Rift Valley Fever virus</b></li> </ul> </li> </ul> |
|---|--|--|

### Direct Contact

These agents can be acquired by directly touching a person or animal or by contact with fluids (urine, feces, vomit, saliva) or tissues from an infected person or animal.

- |  |  |  |
|--|--|--|
| <ul style="list-style-type: none"> <li># <b>Anthrax</b><br/><i>Bacillus anthracis</i></li> <li># <b>Plague</b><br/><i>Yersinia pestis</i></li> <li># <b>Smallpox</b><br/><i>Variola major</i></li> <li># <b>Tularemia</b><br/><i>Francisella tularensis</i></li> </ul> | <ul style="list-style-type: none"> <li># <b>Brucellosis</b><br/><i>Brucella</i> spp.</li> <li># <b>Glanders</b><br/><i>Burkholderia mallei</i></li> <li># <b>Melioidosis</b><br/><i>Burkholderia pseudomallei</i></li> <li># <b>Q Fever</b><br/><i>Coxiella burnettii</i></li> </ul> | <ul style="list-style-type: none"> <li># <b>Nipah Virus</b></li> <li># <b>Hendra Virus</b></li> <li># <b>Rift Valley Fever</b><br/><i>Phlebovirus</i></li> </ul> |
|--|--|--|

### Respiratory Contact

These agents may be spread from person to person by respiratory contact (e.g., sneezing or coughing).

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li># <b>Plague</b><br/><i>Yersinia pestis</i></li> <li># <b>Smallpox</b><br/><i>Variola major</i></li> </ul> | <ul style="list-style-type: none"> <li># <b>Viral Hemorrhagic Fever</b></li> <li># <b>Glanders</b><br/><i>Burkholderia mallei</i></li> </ul> |
|--|--|

### Food

These agents can potentially be spread through a food source (ingestion). Many agents are killed by heat and therefore proper cooking measures can help to prevent disease through this route.

- |  |  |  |
|--|--|--|
| <ul style="list-style-type: none"> <li># <b>Anthrax</b><br/><i>Bacillus anthracis</i></li> <li># <b>Botulism</b><br/><i>Clostridium botulinum</i> toxin</li> <li># <b>Tularemia</b><br/><i>Francisella tularensis</i></li> </ul> | <ul style="list-style-type: none"> <li># <b>Brucellosis</b><br/><i>Brucella</i> spp.</li> <li># <b>Toxins</b><br/><i>Clostridium perfringens</i><br/><i>Ricinus communis</i><br/><i>Staph. aureus</i></li> </ul> | <ul style="list-style-type: none"> <li># <b>Food Safety</b><br/><i>Salmonella</i> spp.<br/><i>E. coli</i> O157:H7<br/><i>Campylobacter</i> spp.</li> </ul> |
|--|--|--|

### Water

These agents can potentially be spread through a water source. This includes contact with contaminated water (e.g., open wounds) as well as drinking contaminated water.

- |   |   |   |
|---|---|---|
| <ul style="list-style-type: none"> <li># <b>Melioidosis</b><br/><i>Burkholderia pseudomallei</i></li> <li># <b>Tularemia</b><br/><i>Francisella tularensis</i></li> </ul> | <ul style="list-style-type: none"> <li># <b>Toxins</b><br/><i>Clostridium perfringens</i><br/><i>Ricinus communis</i><br/><i>Staph. aureus</i></li> </ul> | <ul style="list-style-type: none"> <li># <b>Brucellosis</b><br/><i>Brucella</i> spp.</li> <li># <b>Water Safety</b><br/><i>Cryptosporidium parvum</i><br/><i>Vibrio cholerae</i></li> </ul> |
|---|---|---|

Note: Bioterrorism pathogens may have atypical routes of transmission and clinical manifestations. The agents are listed by currently known means of transmission. Much is still to be learned about many of the agents so other routes may be possible.

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.



**Local Health Department Phone Numbers**

**Champaign Region**

**IDPH Champaign Regional Office**

**217-278-5900**

---

**Champaign County Public Health Department**  
**217-352-7961**

---

**Clark County Health Department**  
**217-382-4207**  
**Toll Free: 1-888-382-4207**

---

**Coles County Health Department**  
**217-348-0530**

---

**Cumberland County Health Department**  
**217-849-3211**

---

**DeWitt-Piatt Bi-County Health Department**  
**217-935-3427 or 217-935-8416**

---

**Douglas County Health Department**  
**217-253-4137**

---

**Edgar County Health Department**  
**217-465-2212**

---

**Ford-Iroquois Public Health Department**  
**815-432-2483**

---

**Livingston County Health Department**  
**815-844-7174**

---

**Macon County Health Department**  
**217-423-6988**

---

**McLean County Health Department**  
**309-888-5450**

*(continued, next page)*



**Moultrie County Health Department**  
217-728-4114

---

**Shelby County Health Department**  
217-774-9555

---

**Vermilion County Health Department**  
217-431-2662

---

## **Chicago Region**

### **IDPH Chicago Regional Office**

**312-793-3376 or**  
**708-544-5300**

---

**Chicago Department of Public Health**  
312-747-9872

---

**Cook County Department of Public Health**  
708-492-2000  
TTY (Hearing Impaired): 708-492-2002

---

**Evanston Health Department**  
847-866-2969

---

**Oak Park Department of Public Health**  
708-358-6400 ext. 5482

---

**Skokie Health Department**  
847-933-8252

---

**Stickney Public Health District**  
708-424-9200



**Local Health Department Phone Numbers**

**Edwardsville Region**

**IDPH Edwardsville Regional Office**

**618-656-6680**

---

**Bond County Health Department  
618-664-1442**

---

**Calhoun County Health Department  
618-576-2428**

---

**Christian County Health Department  
217-824-4113**

---

**Clinton County Health Department  
618-594-2723**

---

**East Side Health District  
618-271-8722**

**Clinic  
618-874-4713**

---

**Greene County Health Department  
217-942-6961 or 942-6962**

---

**Jersey County Health Department  
618-498-9565**

---

**Macoupin County Health Department  
217-854-3223**

---

**Madison County Health Department  
618-692-8954**

---

**Monroe-Randolph Bi-County Health Department  
618-826-5007**

**Environmental Office  
618-939-3871**

**Montgomery County Health Department**  
217-532-2001

---

**Morgan County Health Department**  
217-245-5111

---

**Pike County Health Department**  
217-285-4407

---

**Sangamon County Department of Public Health**  
217-535-3100

---

**Scott County Health Department**  
217-742-8203

---

**Springfield Department of Public Health**  
217-789-2182

---

**St. Clair County Health Department**  
618-233-7703

---

**Washington County Health Department**  
618-327-3644

---

## **Marion Region**

**IDPH Marion Regional Office**  
618-993-7010

---

**Clay County Health Department**  
618-662-4406

---

**Crawford County Health Department**  
618-544-8798

---

**Edwards County**  
No Local Health Department

---

**Effingham County Health Department**  
217-342-9237

---



**Local Health Department Phone Numbers**

**Egyptian Health Department  
(Gallatin, Saline and White Counties)  
618-273-3326**

---

**Fayette County Health Department  
618-283-1044**

---

**Franklin-Williamson Bi-County Health Department  
618-993-8111**

---

**Hamilton County Health Department  
618-643-3522**

---

**Jackson County Health Department  
618-684-3143**

---

**Jasper County Health Department  
618-783-4436**

---

**Jefferson County Health Department  
618-244-7134**

---

**Lawrence County Health Department  
618-943-3302**

---

**Marion County Health Department  
618-548-3878**

---

**Perry County Health Department  
618-357-5371**

---

**Richland County  
No Local Health Department**

---

**Southern Seven Health Department  
(Alexander, Hardin, Johnson, Massac, Pope, Pulaski  
and Union Counties)  
618-634-2297**

**Wabash County Health Department**  
**618-263-3873**

---

**Wayne County Health Department**  
**618-842-5166**

---

**Peoria Region**

**IDPH Peoria Regional Office**  
**309-691-2985**

---

**Adams County Health Department**  
**217-222-8440**

---

**Brown County Health Department**  
**217-773-2714**

---

**Bureau County Health Department**  
**815-872-5091**

---

**Cass County Health Department**  
**217-452-3057**

---

**Fulton County Health Department**  
**309-647-1134**

---

**Hancock County Health Department**  
**217-357-2171**

---

**Henderson County Health Department**  
**309-627-2812**

---

**Henry County Health Department**  
**309-852-0197**

---

**Knox County Health Department**  
**309-344-2224**

---



**Local Health Department Phone Numbers**

**LaSalle County Health Department  
815-433-3366**

---

**Logan County Health Department  
217-735-2317**

---

**Marshall County Health Department  
309-679-6000**

---

**Mason County Health Department  
309-543-2201**

---

**McDonough County Health Department  
309-837-9951**

---

**Menard County Health Department  
217-632-7864**

**Administrative Office  
217-632-3283**

**Home Health Officer  
217-632-7864**

**Public Health Office  
217-636-7694**

---

**Mercer County Health Department  
309-582-3759**

---

**Peoria City/County Health Department  
309-679-6000**

---

**Putnam County Health Department  
815-872-5091**

---

**Rock Island County Health Department  
309-793-1955**

---

**Schuyler County Health Department  
217-322-4373**

*(continued, next page)*

**Stark County Health Department**  
309-852-3115

---

**Tazewell County Health Department**  
309-925-5511 or 477-2223

---

**Warren County**  
No Local Health Department

---

**Woodford County Health Department**  
309-467-3064

---

## **Rockford Region**

**IDPH Rockford Regional Office**  
815-987-7511

---

**Boone County Health Department**  
815-544-2951

---

**Carroll County**  
No Local Health Department

---

**DeKalb County Health Department**  
815-758-6673

---

**Jo Daviess County Health Department**  
815-777-0263

---

**Lee County Health Department**  
815-284-3371

---

**Ogle County Health Department**  
815-732-3201, Ext. 247

---

**Stephenson County Health Department**  
815-235-8271

---

**Whiteside County Health Department**  
815-772-7411 Ext. 16  
24 hour: 815-772-4213

---



**Local Health Department Phone Numbers**

Winnebago County Health Department  
815-962-5092

---

**West Chicago Region**

IDPH West Chicago Regional Office  
630-293-6800

---

DuPage County Health Department  
630-682-7400

---

Grundy County Health Department  
815-941-3113

---

Kane County Health Department  
630-208-3801

Personal Health  
630-897-1124

Prenatal Care  
847-695-0848

---

Kankakee County Health Department  
815-937-3560

---

Kendall County  
Department of Health & Human Services  
630-553-9100

---

Lake County Health Department  
847-377-8328

---

McHenry County Health Department  
815-334-4510

---

Will County Health Department  
815-727-8485