

Biological Threat Fact Sheets

Anthrax

Agent: *Bacillus anthracis*

There are three clinical forms of *B. anthracis* which are determined by route of entry:

- Pulmonary or Inhalation—BT implications
- Cutaneous—most common
- Gastrointestinal

Key Characteristics:

- Aerobic or facultative anaerobe
- Spore-forming
- Gram-positive rods
- Non-hemolytic (gamma)
- Non-motile



Acceptable Specimens:

- Isolate
- Cutaneous anthrax: sterile swab from vesicular or eschar stage
- Gastrointestinal anthrax: Blood culture, stool (≥ 5 g) or rectal swab
- Inhalational anthrax: Blood culture, lower respiratory specimen (>1 ml)
- Environmental samples submitted by law enforcement personnel

Specimen Submission:

All specimens must be triple contained in accordance with federal shipping regulations. All clinical specimens must be accompanied by a specimen submission form (G-2B). Prior to submission, please call (512) 458-7185 or (888) 963-7111, ext. 7815 *toll free*.

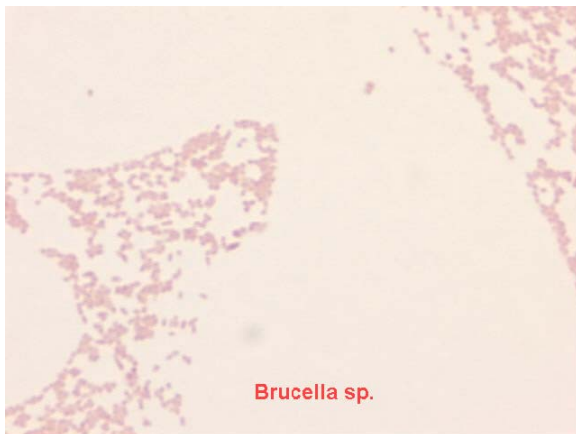
Brucellosis

Agent: *Brucella abortus*, *Brucella melitensis*, *Brucella suis*, and *Brucella canis*

- Aerosols of *Brucella* spp. are considered to be highly infectious.
- *B. melitensis* produces the most severe and acute form of disease.
- *B. abortus* produces a more chronic form of disease.
- *B. suis* may also cause severe acute disease, but is associated with osteomyelitis.
- *B. canis* rarely causes disease in humans.

Key Characteristics:

- Small gram-negative coccobacilli
- Slow-grower, colonies appear after 48-72 hrs of incubation
- Non-motile
- Oxidase positive
- Urease positive
- X and V factors not required



Acceptable Specimens:

- Isolate
- Blood culture
- Bone marrow
- Tissue sample
- Environmental samples submitted by law enforcement personnel

Specimen Submission:

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Botulism

Agent: *Clostridium botulinum*

There are three forms of botulism:

- Foodborne (classic form)
- Wound
- Intestinal (infant and adult)

Key Points:

- Please have physician consult with the Infectious Disease Control Unit (IDCU) prior to sample collection:
 - (800) 252-8239 (“press 1”)

Acceptable Specimens:

- Stool
 - 10-50 grams recommended for an adult
 - ≥5 grams recommended for an infant
 - Do not freeze
- Serum
 - 10ml minimum for an adult is recommended
 - Not recommended for infant testing
- Wound
 - Tissue from a biopsy or swab from deep in the wound
- Food
 - Only tested if associated with a confirmed botulism case

Shipping conditions:

- Stools and serum
 - Should be shipped cold (on cold packs, not dry ice) by overnight courier
- Wound
 - Ship tissue in anaerobic atmosphere
 - Swab in anaerobic transport for swabs
 - Ship without refrigeration
- Food
 - Should be shipped in original container under current storage conditions (Example: cold storage submitted cold; frozen storage submitted frozen; etc)

Specimen Submission:

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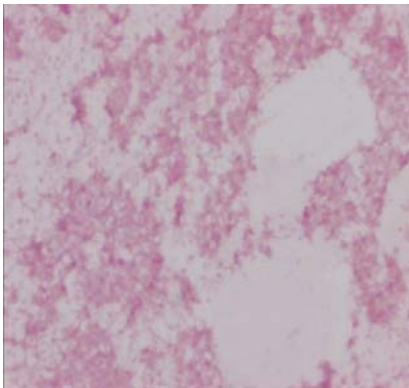
Tularemia

Agent: *Francisella tularensia*

- Aerosols of *F. tularensis*. are considered to be highly infectious.
- Two subspecies cause human disease:
 - *F. tularensis* subsp. *tularensis* (highly virulent)
 - *F. tularensis* subsp. *holarctica* (less virulent)

Key Characteristics:

- Tiny gram-negative coccobacilli
- Slow-grower, colonies appear after 48-72 hrs of incubation
- Usually requires cysteine supplementation
- Non-motile
- Oxidase negative
- Urease negative
- Beta-lactamase positive
- X and V factors not required



Acceptable Specimens:

- Isolate
- Blood culture
- Biopsied tissue or scraping of an ulcer (preferable)
- Swab of an ulcer (acceptable alternative)
- Tissue aspirate
- Environmental samples submitted by law enforcement personnel

Specimen Submission:

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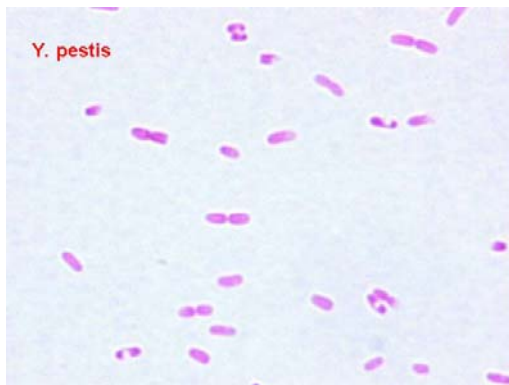
Plague

Agent: *Yersinia pestis*

- Three forms of plague:
 - Bubonic: infected lymph nodes
 - Septicemic: blood-borne organisms
 - Pneumonic: transmissible person-to-person; deadliest

Key Characteristics:

- Gram-negative coccobacilli with bipolar staining
- Colonies appear after 24-48 hrs of incubation
- Grows better at 22-25°C
- Non-motile
- Oxidase negative
- Urease negative



Acceptable Specimens:

- Isolate
- Bubonic: Aspirate of involved tissue (bubonic) or biopsied specimen: Tissue or aspirates that can be obtained for culture include liver, spleen, bone marrow, lymph node, and/or lung
- Septicemic: blood
- Pneumonic: Bronchial wash or transtracheal aspirate (>1 ml)
- Environmental samples submitted by law enforcement personnel

Specimen Submission:

All specimens must be triple contained in accordance with federal shipping regulations. All clinical specimens must be accompanied by a specimen submission form (G-2B). Prior to submission, please call (512) 458-7185 or (888) 963-7111, ext. 7815 *toll free*.

Melioidosis Glanders

Agent: *Burkholderia pseudomallei* and *Burkholderia mallei*

- *B. pseudomallei*- causative agent of melioidosis
- *B. mallei* – causative agent of glanders

Key Characteristics:

- *B. pseudomallei*
 - Gram-negative rods with bipolar staining
 - Oxidase positive
 - Indole negative
 - Motile
 - Resistant to colistin/polymyxin B
- *B. mallei*
 - Faintly staining, gram-negative coccobacilli
 - Oxidase variable
 - Indole negative
 - Non-motile
 - Resistant to colistin/polymyxin B

Acceptable Specimens:

- Isolate
- Blood
- Urine
- Abscesses, tissue aspirates, fluids
- Environmental samples submitted by law enforcement personnel

Specimen Submission:

All specimens must be triple contained in accordance with federal shipping regulations. All clinical specimens must be accompanied by a specimen submission form (G-2B). Prior to submission, please call (512) 458-7185 or (888) 963-7111, ext. 7815 *toll free*.

Ricin Toxin

Agent: Ricin toxin

- Ricin toxin is derived from castor beans, *Ricinus communis*.
- Medical tests to confirm that a person has been exposed to ricin are not widely available.
- No antidote exists for ricin.



Acceptable Specimens:

- Clinical:
 - **Texas Department of State Health Services, Austin, does not currently accept clinical samples for ricin toxin testing.**
 - Serum (acute and convalescent – 2 weeks apart) testing is performed at the CDC
 - Not indicated unless a known exposure has occurred
- Environmental: food, beverage, soil, water, powder, swabs, wipes, paper, plant material
 - Submitted by law enforcement personnel only

Specimen collection:

- Collect specimens in plastic containers and be triple contained in accordance with federal shipping
- Store specimens at room temperature or refrigerate
- NEVER freeze or heat samples suspected of containing ricin toxin, as this will denature the toxin

Specimen Submission:

Prior to submission, please call (512) 458-7185 or (888) 963-7111, ext. 7815 *toll free*.

Staphylococcal Enterotoxin B (SEB)

Agent: Staphylococcal enterotoxin B (SEB)

- SEB is one of several exotoxins produced by *Staphylococcus aureus*.
- SEB is the enterotoxin that most commonly causes classic food poisoning.

Acceptable Specimens:

- Clinical: **Texas Department of State Health Services, Austin, does not currently accept clinical sample for SEB testing.**
- Environmental: paper, powder, swabs, wipes, water, soil, food, beverage
 - Submitted by law enforcement personnel only

Specimen Submission:

Prior to submission, please call (512) 458-7185 or (888) 963-7111, ext. 7815 *toll free*.

Q Fever

Agent: *Coxiella burnetii*

- *C. burnetii* is an obligate intracellular organism and cannot be cultured on routine bacteriologic media.
- Due to the extreme infectivity of *C. burnetii*, Level A (Sentinel) laboratories should not attempt to culture this organism.

Acceptable Specimens:

- Blood - Collect blood in EDTA (lavender) or sodium citrate (blue) and maintain at 4°C for storage and shipping for PCR or special cultures

Specimen Submission:

All specimens must be triple contained in accordance with federal shipping regulations. All clinical specimens must be accompanied by a specimen submission form (G-2B). Please call (512) 458-7185 prior to submission.