



Post Exposure Plan for *Yersinia pseudotuberculosis*

Background Information:

Yersinia pseudotuberculosis is found worldwide and is most common in younger patients and immunocompromised individuals.

Yersinia pseudotuberculosis is a rare cause of acute enteric disease. Symptoms include abdominal pain, diarrhea, rash and fever. Because of this bacteria's ability to cause mesenteric lymph swelling, infection can mimic appendicitis. *Y.pseudotuberculosis* is rarely associated with invasive disease (sepsis) unless a patient also has pre-existing liver disease or has an iron-overload condition (e.g. venous congestion, hemochromatosis, cirrhosis, hemolytic anemia – including those caused by hemoglobin abnormalities); these patients are at slight increased likelihood for sepsis.

One to 3 weeks after the acute phase of the disease, post-infection complications can occur, such as reactive arthritis and erythema nodosum (inflammation of fat cells under the skin, resulting in tender red bumps typically found on the shins). Reactive arthritis can last up to 6 months and is more common in women vs. men. Complications from the disease include lesions on lymph nodes, spleen and liver, as well as blood poisoning in immunocompromised patients. In healthy individuals, this is generally a self-limiting disease.

The primary reservoir hosts are wild mammals, pigs, cattle, birds and pets. Human are incidental hosts.

The modes of transmission can be by fecal to oral transmission and spread from human-human, animal-human or through consumption of contaminated food or water. Additionally, contact with infectious soil can cause infection.

Laboratory-acquired infections are presumed to occur via exposure to splashes or aerosolized materials contaminated with bacteria particles. Also, via eating with bacteria-contaminated hands.

Primary hazards in the laboratory :

Creation of splashes or aerosols, exposure to mucous membranes, ingestion, and exposure to contaminated sharps.

Acceptable disinfectants:

Yersinia pseudotuberculosis is susceptible to 2-5% phenol, 1% sodium hypochlorite, 70% ethanol, 4% formaldehyde, 2% glutaraldehyde, 2% peracetic acid, 3-6% hydrogen peroxide and 0.16% iodine.

Exposure controls and personal protection:



Yersinia pseudotuberculosis is a Risk Group 2 organism. BSL-2 practices, containment equipment, and facilities are required when working with materials known or suspected of containing this agent.

Personal protective equipment such as lab coats and gloves must be worn when handling infected or potentially infected materials. Eye protection must be used when there is a known or potential risk of generating splashed or aerosols.

Procedures that may generate aerosols or splashes should be conducted in a certified biosafety cabinet.

Personnel should wash their hands frequently while working in and before leaving the laboratory. Personal items including water bottles, cell phones, car keys, etc., should be stored in such a way as to avoid contamination and should be accessed only when the laboratory exercise is completed, lab coats and gloves are removed, and hands are washed.

The Principal Investigator (PI), or their designee, must ensure that all personnel are adequately trained in safe laboratory practices, universal precautions, and proper surface and equipment disinfection before initiating any work with this agent. The PI must also ensure that all personnel are aware of the signs and symptoms of a potential infection with *Y. pseudotuberculosis* with an emphasis on the effects on the immunocompromised, children, young adults or anyone with an underlying condition that may predispose them to more severe disease.

At risk populations:

Children, young adults and immunocompromised individuals are at greatest risk of severe disease or death. Individuals with hemochromatosis (an iron metabolism disorder resulting in iron accumulation in tissues/organs) or any disease with a potential for iron overload are especially susceptible to infections with *Yersinia* species.

Immediate Action by Route of Exposure:

Needlestick, Animal Bite, Laceration: Wash area thoroughly with soap and running water. Do not apply disinfectant to the skin.

Mucous membranes (Eyes, nose, mouth): Flush the eyes for 10-15 minutes if eyes have been exposed to splash or spray containing bacteria. Rinse out mouth, without swallowing, after any exposure.

Inhalation: If contaminated materials are aerosolized and potentially inhaled, rinse mouth twice and spit. Do not swallow.

After First Aid:

Suspected infections related to research exposures must be reported to the University of Colorado, Boulder's Biosafety Officer at 303-492-2817. Please see below for complete instructions related to suspected research exposure. Treating medical providers should be informed of the possibility of *Y. pseudotuberculosis* infection. The incubation period for this disease ranges from 5-10 days but can be



as long as 21 days. Symptomatic individuals are recommended to be tested for *Y. pseudotuberculosis*. Definitive diagnosis is via culture but most commercial clinical labs in the U.S. cannot routinely detect this bacteria unless the treating health care provider specifically requests the lab look for this organism.

Post-exposure Prophylaxis:

Your health care provider can recommend appropriate treatment. The type and duration of antibiotic treatment will depend upon whether you show any signs of systemic infection.

Symptoms of infection in adults:

- Pain and tenderness in the abdomen
- Diarrhea
- Fever
- Potential reactive arthritis (generally post-infection)
- Potential skin rash

After First Aid – Treatment and Reporting:

University of Colorado Boulder: Procedures for Work-Related Injuries or Illness, Including Animal Bites, Severe Allergic Symptoms, and Sharps Exposures.

It is the policy of the University of Colorado at Boulder (UCB) that all incidents that result in an injury or severe illness to faculty, staff or students be appropriately documented and reported. If a work-related incident, accident, injury or illness occurs:

a) Medical Treatment

- In case of life or limb-threatening emergency call 911** or go immediately to the nearest emergent or urgent care facility. Immediately administer appropriate first aid, including thoroughly washing any wounds or exposed areas with soap and water, if at all possible.
- If you are an employee of the University and you need non-emergency care** for a work-related illness or injury that has occurred during regular weekday working hours, you must be treated at one of the UCB Designated Medical Providers (DMPs: shown below). **Boulder Community Hospital Emergency Department has the ability to rapidly test for work-related infectious disease or potential biological exposures; all other DMPs may not have this rapid capability.** Testing can be done on the exposed personnel; it may be difficult to test any source patient or sample at the DMP.
- After hours or while traveling**, go to the nearest urgent or emergent care facility.
- Sharps injuries** that include exposure to human blood, body fluids, tissues, tissue culture cells are considered to be injuries with a potential for transmitting bloodborne pathogens. Prompt evaluation and treatment is necessary for these injuries. (go to Boulder Community Hospital Emergency Department)



b) Reporting

- a. Report the work-related injury or illness to your supervisor immediately. You or your supervisor should notify the Biosafety Officer at 303-492-2817 or at Cher.Masini@colorado.edu . (The BSO may confer with IACUC administrator, veterinarian, or Occupational Health RN.)
- b. You must file a worker's compensation injury report form **within 4 days of the work-related injury** / exposure or illness onset. Report the incident on the URM website and use the on-line reporting form.
- c. Sharps injuries must be reported on the URM's needle stick exposure report form.
- d. All injury reporting forms can be found at the URM's website at <https://www.cu.edu/risk/file-claim>

c) Eligibility (who is eligible to be seen by UCB Designated Medical Providers?)

- a. All UCB employees, paid UCB staff, graduate students receiving a traineeship or stipend administered by UCB, undergraduate work-study students and paid undergraduate student assistants are eligible to be seen by UCB DMPs. If you are an UCB employee and you visit your regular primary care provider for a work-related injury and your visit is coded as a work-related injury, your primary insurance may not cover the cost of your visit or treatment with your primary care provider.

Some individuals are not covered by UCB Worker's Compensation: All visiting or resident scholars who do not receive payment via UCB (e.g., Howard Hughes Medical Institute Fellows) must follow the work-related exposure / illness or injury protocol outlined by their parent institution or outside funding source. Contract or consulting employees are also not covered by UCB Worker's Compensation; they need to follow the work-related exposure / illness or injury protocols established by their parent institution or consult with their personal health care provider. Volunteers, contract employees and students not paid by UCB are **not** covered by UCB Worker's Compensation and should be seen by their personal health care provider. If you are a student with a Wardenburg Health care plan, post-exposure lab tests are available and covered.

d) Payment and questions:

- a. All bills from medical providers must be sent to University Risk Management:
University Risk Management (<https://www.cu.edu/risk/file-claim>)
1800 Grant Street, Ste 700
Denver, CO 80203
Fax: 303-860-5680
- b. For further questions, contact URM at: 303-860-5682 or 888-812-9601

UCB Designated Medical Providers

This list changes frequently. For a current listing of DMPs, please refer to the University of Colorado's Risk Management website at: <https://www.cu.edu/risk/dmp>