Tufts University / Tufts Medical Center

Exposure Response Plan for Laboratory Handling of *Yersinia pseudotuberculosis*

**Background Information:**

*Yersinia pseudotuberculosis* is a gram-negative bacterium which primarily causes tuberculosis like symptoms in animals. Natural human infections are zoonotic typically acquired through a food borne route. Symptoms of infection can differ depending on the immune status of the host.

**Signs and Symptoms of Infection:**

Disease in healthy adults is self-limiting with a low case fatality rate. Sepsis associated illness in those with chronic liver diseases including hemochromatosis carries a mortality rate of approximately 75%. More severe disease is possible in individuals with a compromised immune system.

Within 3–10 days of exposure, you may develop pain and abdominal tenderness. Diarrhea may occur, but this is NOT typical. Abdominal pain is often on the right side (like appendicitis), but is due to swollen lymph nodes. Other typical symptoms include fever and skin rash. Less typically you may exhibit a very red tongue that looks like a strawberry, sore throat, headache, low blood pressure and swollen lymph nodes.

Your body may react by developing a red rash with firm, tender nodules on the shins, swollen or tender joints and eye inflammation.

**Pre-exposure Health Screening:** Employees must be given a copy of this information at the initiation of work in laboratories in which *Yersinia pseudotuberculosis* is used.

Immunizations and prophylaxis are not available.

Workers with concerns about pre-existing medical conditions should make an appointment with Occupational Health to discuss with physician. Persons with hemochromatosis are especially susceptible to infections with *Yersinia* species. Hemochromatosis is a disorder of iron metabolism. Excess iron accumulates in tissues and organs as the body has not mechanism for excess iron excretion. Diagnosis of this disease is often missed. The disease can have genetic or nongenetic causes. Men with genetic disease tend to become symptomatic in their 40’s and women about 15 years post menopause. A fatal lab acquired infection of *Y. pestis* occurred in 2009. Route of transmission is unclear. The strain was thought to be nonvirulent due to removal of the element related to iron absorption. It is believed that the undiagnosed man had such an iron overload that the strain overcame the deletion and acquired enough iron to become dangerous. As an insulin dependent diabetic he was also at increased risk. Screening for iron overload generally begins by measuring the protein that binds iron.

**Exposure Incident:** Any exposure of the agent to the eyes, nose or mouth. Percutaneous exposure via needle stick, bite or scratch. Cutaneous exposure via damaged skin. Inhalation of aerosols.

**Reporting Exposure Incidents:** All exposure incidents must be reported immediately to the supervisor, the Biosafety Officer and are reportable to the Massachusetts Department of Public Health.

**Before an Exposure Incident Occurs:**
Immunization is currently not available.

In the event of a non-overt exposure but the individual develops signs and symptoms consistent with *Y. pseudotuberculosis* infection, the individual must seek medical attention from the Tufts Occupational Medical Service provider or an emergency room.

**After an exposure incident occurs: immediate action by route of exposure**

- **Needle stick, laceration, bite, and contact with non-intact skin**: Wash the area with soap and running water. Do not apply bleach, alcohol or other disinfectant to the skin.

- **Mucous membranes (eye, nose, mouth)**: If contaminated material is ingested, rinse mouth out with clean water. If contaminated material is splashed or sprayed into the eyes, flush the eyes for 10-15 minutes.

- **Inhalation**: If contaminated materials are aerosolized outside of a biological safety cabinet and the cloud inhaled, rinse mouth twice expelling the rinsate. Do not swallow.

- **Contact with intact skin and clothing**: Remove contaminated clothing using gloves and process as medical waste. Wash skin with soap and water.

- **Ingestion of contaminated materials**: No specific treatment available. Monitor for symptoms.

Report all exposures to the Principal Investigator and seek medical evaluation.

**After an exposure incident occurs: medical evaluation and follow-up:**

Following immediate actions, contact the TMC Employee Health Clinic (Boston), TCSVM Occupational Medical Clinic (Grafton) or the Mt. Auburn Occupational Health Services (Medford) and arrange for medical diagnosis and treatment.

During this medical evaluation, the employee will be instructed on the signs or symptoms of infection and instructed how to identify specific signs and symptoms:

If exposed individual develops signs and symptoms of suspect infection, s/he must be evaluated in the Clinic or referred to a Specialist as soon as possible and within 24 hours. Any infection will be assumed to be laboratory acquired until proved otherwise.

**Post-exposure pre-symptom prophylaxis:**

The decision to implement post exposure prophylaxis will depend on a risk assessment made by the physician based on the risk of infection as compared with the risk of antimicrobial drugs.