Tufts University/Tufts Medical Center

Exposure Response Plan for the Laboratories Handling *Listeria monocytogenes*

**Background Information**

*L. monocytogenes* is a motile gram-positive rod. It produces disease and asymptomatic carriers in both humans and animals. The organism has been isolated from soil, animal feed as well as contaminated human food and surfaces of food processing equipment. The disease is termed listeriosis. Most human infections follow consumption of contaminated raw foods. Refrigeration does not slow growth of bacteria significantly. Hospital care is needed in about 85% of the symptomatic infections. Skin and eye contact have led to occupationally acquired infections. Transplacental infections can result in miscarriage, premature delivery, stillbirth or neonatal death.

*Exposure Incident:* Any exposure of the agent to the eyes, nose or mouth, nonintact skin or inhalation of aerosols. Diagnosis is often delayed because symptoms are similar to other agents. If you work with or around this agent, bring this to your healthcare provider’s attention. The infectious dose is unknown and is believed to vary with both strain and host susceptibility. Lab acquired infections have rarely been reported.

*Reporting Exposure Incidents:* Report all exposures to the Principal Investigator/lab supervisor and seek immediate medical evaluation. If help is needed with injuries or clean up, members of the University will contact the police at 6-6911 and members of the Tufts Medical Center will contact security at 6-5100. Whenever there is an accident involving *Listeria*, the Biosafety Officer must be notified.

**Pre-exposure Health Screening:**

Prior to beginning work with or around *Listeria*, the PI or an Employee Health Professional will inform each person of the risks s/he takes and of the symptoms s/he may experience following exposure. Listeriosis primarily affects older adults, pregnant women, newborns, and adults with weakened immune systems. Based on the seriousness of the effects, pregnant women may want to avoid occupational exposure.

**Before an Exposure Incident Occurs:**

Immunization for *Listeria* is not available.

All immunocompromised employees who might potentially be exposed to *Listeria* during routine work should be advised to self-identify to Employee Health Clinic (Boston) or Occupational Medical Clinics (Grafton/Medford) for further evaluation and discussion of the specific risks associated with immunodeficiency and exposure to *Listeria*. The following diseases and medications are risk factors for Listeria infection, most of which are associated with at least some degree of immunosuppression:
• Glucocorticoid therapy
• Hematologic malignancies
• Solid tumors
• Organ transplantation (especially renal)
• AIDS
• Treatment with tumor necrosis factor-alpha antagonists
• Diabetes mellitus
• End-stage renal disease (including hemodialysis and peritoneal dialysis)
• Iron overload
• Collagen-vascular diseases
• Other serious chronic nonmalignant diseases
• Liver disease and alcoholism

Pregnant women are 20 times more likely to become infected than non-pregnant healthy adults. Infection can occur at any time during pregnancy, but it is most common during the third trimester when the immune system is somewhat suppressed. Discussion with a healthcare provider is recommended.

Use of antacids and medications that block gastric acid production increases the risk of infection. Self identification and subsequent discussion as noted above should be considered.

**After an Exposure Incident Occurs: Immediate Action by Route of Exposure**

**Needlestick, Animal Bite or Laceration**: Wash the area with soap and running water.

**Mucous membranes (eye, nose, mouth)**: If contaminated material is splashed or sprayed contaminating the eyes, nose or mouth: Flush the eyes for 10-15 minutes. Rinse mouth out with clean water and do not swallow.

**Inhalation**: If contaminated materials are aerosolized outside of primary containment and potentially inhaled, rinse mouth twice expelling the rinsate. Do not swallow.

**After an Exposure Incident Occurs: Medical Evaluation and Follow-up**:

Following immediate post exposure 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 evaluation, diagnosis and treatment if needed.

During this appointment, the exposed individual will be informed of the signs and symptoms of listeriosis, and will be instructed to watch for the development of these signs and symptoms. Serological tests are unreliable. Bacteria are usually isolated from a normally sterile body site or fluid like blood. Most healthy people will not show symptoms, or may have a febrile gastroenteritis that resolves spontaneously.
**Signs and Symptoms of Listeriosis include:**
- Influenza like symptoms including fever and chills
- Nausea/vomiting
- Pregnant women may experience mild flu-like symptoms, headaches, muscle aches, fever, nausea, and vomiting. If the infection spreads to the nervous system it can cause stiff neck, disorientation, or convulsions.

The incubation period is variable with a median of 3 weeks and a range of 3-70 days. PLEASE NOTE: Workers must be aware of the remarkably long incubation period of listeriosis, as symptoms may occur months after an exposure. If an exposed individual experiences signs or symptoms of listeriosis, s/he must immediately notify the PI and the campus Biosafety Officer. S/he also must be evaluated at TMC Employee Health Clinic (Boston), referred to an ID specialist by the TCSVM Occupational Health nurse (Grafton), or evaluated by a physician at the Mount Auburn Occupational Health Services (Medford).

The more serious cases of listeriosis may take one to six weeks to develop. These cases may result in meningitis (brain infections) and septicemia (bacteria in the bloodstream). Both have a high mortality rate.

**Post-exposure Prophylaxis:**

There is currently no post exposure pre-symptom prophylaxis for listeriosis.

Massachusetts Department of Public Health classifies listeriosis as a reportable disease. It must be reported to the Local Board of Health immediately by the attending physician. In accordance with Massachusetts regulation, any clinical laboratory identifying an infection caused by *Listeria* species may be reported to the Massachusetts Department of Public Health in accordance with disease-reporting regulations.

This disease is also reportable on the national level.

If an employee develops signs and symptoms associated with *Listeria* exposure in the absence of an exposure incident, the PI and Biosafety Officer shall be notified immediately. Isolated infection will be considered laboratory-acquired until proven otherwise.