

Exposure Response Plan for Laboratory Handling of *Listeria monocytogenes*

Background Information

Listeria monocytogenes is a motile, gram-positive rod that causes disease in both humans and animals, as well as asymptomatic carriage. It has been isolated from soil, animal feed, contaminated human food, and food-processing surfaces. The disease it causes is **listeriosis**.

Most human infections result from ingestion of contaminated food; refrigeration does not significantly slow its growth. Occupational infections have occurred from skin and eye contact with contaminated material. Transplacental transmission can result in miscarriage, premature delivery, stillbirth, or neonatal death.

High-risk groups include pregnant women, newborns, older adults, and individuals with weakened immune systems.

Pregnancy-associated listeriosis most often occurs during the third trimester. It may present as a mild, flu-like illness with fever, chills, malaise, joint pain, back pain, and diarrhea. In many cases the infection may be subclinical or go unnoticed, but intrauterine infection can lead to severe outcomes including miscarriage, fetal death, premature delivery, or the death of the newborn shortly after birth. Surviving infants may develop either early- or late-onset disease. Early-onset neonatal listeriosis, resulting from transplacental infection, typically presents as pneumonia or sepsis and can progress to widespread granulomas known as *granulomatosis infantisepticum*. Late-onset disease occurs from exposure during delivery, with affected newborns developing meningitis one to several weeks after birth. The mortality rate for both early- and late-onset neonatal listeriosis is estimated at 20 to 30 percent.

Listeriosis of the central nervous system (CNS) is another serious form of the disease, with meningitis being the most common presentation. Symptoms can include high fever, stiff neck, tremors, ataxia, and seizures. In some cases, non-meningitic CNS involvement occurs as encephalitis, particularly affecting the brainstem (rhombencephalitis).

Febrile gastroenteritis is a non-invasive form of listeriosis that appears as a typical gastrointestinal illness. It usually causes fever, diarrhea, and vomiting, and is often linked to ingestion of contaminated food.

Glandular listeriosis resembles infectious mononucleosis, presenting with swelling of the salivary glands and cervical lymph nodes. Although less common, it may lead to misdiagnosis due to its similarity with other glandular illnesses.

Local listeriosis can occur after direct contact with infectious material. In these cases, papules or pustules may form on the hands or arms, sometimes accompanied by systemic symptoms such as fever, muscle aches, or headache.

Typhoid-like listeriosis is characterized by a high, sustained fever and is seen most frequently in immunocompromised individuals. This presentation is particularly concerning in patients with weakened immune systems due to other underlying conditions.

Atypical listeriosis is rare but has been documented in case reports. Presentations may include endocarditis, pleural effusions with mononuclear exudates, pneumonia, urethritis, and abscesses. These forms are uncommon but highlight the diverse and sometimes unpredictable nature of *Listeria monocytogenes* infections.

Special Considerations

Pregnant or immunocompromised workers should be evaluated with high priority due to risk of severe disease and neonatal transmission. For more information contact [Occupational Health](#) or call (951) 827-5528.

UC Riverside – Occupational Health Pre-Exposure Health Screening for *Listeria monocytogenes*

Before beginning work with or around *Listeria monocytogenes*, the Principal Investigator (PI) and/or UCR BSO or UC Riverside Occupational Health will review the risks of exposure and the signs and symptoms of listeriosis with the worker. Listeriosis is of greatest concern for older adults, pregnant women, newborns, and individuals with weakened immune systems. Because of the seriousness of potential outcomes, pregnant workers are strongly encouraged to avoid occupational exposure.

Any worker who has questions about their personal health risks or pre-existing medical conditions is encouraged to schedule a confidential consultation with UCR Occupational Health. Appointments can be arranged by contacting **UCR Occupational Health at (951) 827-5528 or ehsocchealth@ucr.edu**. At this time, there is no immunization available for *Listeria*.

Medical Conditions and Treatments That Increase Risk

Certain medical conditions and therapies are associated with immunosuppression and a higher risk of serious listeriosis infection. These include:

- Glucocorticoid therapy
- Hematologic malignancies
- Solid tumors
- Organ transplantation (especially renal)
- HIV/AIDS

- Treatment with tumor necrosis factor-alpha (TNF- α) antagonists
- Diabetes mellitus
- End-stage renal disease (including hemodialysis and peritoneal dialysis)
- Iron overload
- Collagen-vascular diseases
- Other serious chronic non-malignant diseases
- Liver disease and alcoholism

Special Considerations for Pregnancy

Pregnant women are estimated to be 20 times more likely to develop listeriosis than healthy non-pregnant adults. Infection can occur at any time during pregnancy but is most common during the third trimester when immune function is somewhat reduced. Even mild illness in the mother may result in serious complications for the fetus, including miscarriage, stillbirth, premature delivery, or neonatal death. For this reason, it is recommended that pregnant workers discuss their risks directly with a healthcare provider.

Additional risk factors include the use of antacids and other medications that reduce gastric acid, which can increase susceptibility to infection. Workers are encouraged to self-identify if they have concerns and to consult with UCR Occupational Health for further guidance.

Laboratory Precautions

- PPE: Lab coat, gloves, and eye protection are required.
- Engineering Controls:
 - Conduct aerosol-generating procedures in a Biological Safety Cabinet (BSC).
 - Minimize use of sharps (needles, syringes, scalpels).
- Animal Work: When handling animals infected with *Listeria monocytogenes* or working with large-scale cultures, additional safety measures are required. All such activities must be conducted under Animal Biosafety Level 2 (ABSL-2) conditions.
- Waste Disposal: All contaminated material must be autoclaved or disinfected using an EPA-approved disinfectant effective against *Listeria*.

Exposure Incident Definition

An exposure incident includes:

- Contact of *L. monocytogenes* with eyes, nose, or mouth.
- Contact with non-intact skin.
- Inhalation of aerosols.

Diagnosis may be delayed due to similarity of symptoms with other infections. Any worker who suspects exposure should inform their healthcare provider of potential laboratory contact with *Listeria*.

Immediate Response Following Exposure

- Needlestick, bite, or laceration: Wash thoroughly with soap and water.
- Mucous membrane exposure (eyes, nose, mouth): Flush eyes for 10–15 minutes with clean water; rinse mouth thoroughly without swallowing.
- Inhalation/aerosol exposure: Inhalation/aerosol exposure: Move to fresh air. Rinse mouth twice and expel without swallowing.

Reporting Exposure Incidents

Any exposure incident—such as contact of *Listeria* with eyes, nose, mouth, broken skin, or inhalation of aerosols—must be **immediately reported** to:

- **Your PI or laboratory supervisor**
- **UCR Biosafety Officer (BSO) and EHSRM at (951) 827-5528.**
- **Occupational Health [Occupational Health](#)**
- **You may contact the [UCI Medical Center Infectious Disease Fellow on call at 714-456-6011 for immediate counseling and guidance](#). UCR maintains an agreement with the UCI Center for Occupational and Environmental Health (COEH) Clinic, which serves as our Occupational Health provider and reviews UCR's Animal Occupational Health Program.**
- All exposures, injuries, or near-misses must also be documented through the [Injury Reporting Form](#) available on the EH&S website. This documentation is required under the UCR Injury and Illness Prevention Program (IIPP) and Cal/OSHA regulations.

Undergraduate Student Employees report your injury to your supervisor (or go to [Employee Injuries](#)).

For life-threatening injuries, call **911 immediately**.

For all other injury types, seek Medical Treatment at UCR's preferred Occupational Clinics. Visit the [Medical Treatment Facilities](#) webpage to learn more about where to seek medical treatment.

Signs and Symptoms of Concern

- General: fever, chills, muscle aches, nausea, vomiting

- CNS involvement: stiff neck, disorientation, convulsions
- Pregnancy-related: mild flu-like illness, which may precede severe outcomes for the fetus

Note: The incubation period is highly variable, ranging from 3 to 70 days (median ~3 weeks). Workers must remain alert for symptoms weeks after exposure and seek prompt medical evaluation if they occur.

Laboratory testing: Diagnosis can be confirmed through laboratory tests, including culture or PCR of:

- Feces (to detect intestinal carriage or shedding)
- Cerebrospinal fluid (CSF) (for CNS infections/meningitis)
- Blood samples (for septicemia or systemic infection)

Post-Exposure Prophylaxis

No pre-symptom prophylaxis is available for listeriosis. Treatment decisions will be made by the healthcare provider, typically involving antibiotics if infection is suspected.

The primary treatment for human listeriosis is ampicillin or amoxicillin, often combined with gentamicin or erythromycin. The usual course of therapy is ampicillin administered for 2 to 4 weeks. In immunocompromised patients, the addition of gentamicin for approximately 2 weeks is recommended. For individuals with a β -lactam allergy, intravenous co-trimoxazole is considered an effective alternative.

Reporting Requirements

- Listeriosis is a the [California Department of Public Health \(CDPH\)](#).
- If diagnosed, it must be reported immediately to the within a day of identification [Riverside County Department of Public Health](#).
- National notification is also required through [CDC reporting systems](#).
- At UC Riverside, all suspected or confirmed cases of laboratory-acquired listeriosis must be reported to:
 - The PI or lab supervisor
 - The UCR Biosafety Officer or Occupational Health

Biosafety References

- Centers for Disease Control and Prevention (CDC) & National Institutes of Health (NIH). (2020). *Biosafety in Microbiological and Biomedical Laboratories (BMBL)* (6th ed.). U.S. Department of Health and Human Services. https://www.cdc.gov/labs/pdf/safety/BMBL6_2020.pdf
- California Department of Public Health (CDPH). (n.d.). *Listeriosis – Disease Information for Providers*. <https://www.cdph.ca.gov>
- Riverside University Health System – Public Health. (2025). *Communicable Disease Reporting Requirements*. Riverside County, CA. <https://www.ruhealth.org/public-health/disease-control/communicable-disease-reporting>
- Centers for Disease Control and Prevention (CDC). (2025). *National Notifiable Diseases Surveillance System (NNDSS): Listeriosis*. <https://www.cdc.gov/nndss/infectious-disease/index.html>

Agent-Specific Reference Sheets (examples from other institutions)

- Cornell University Environmental Health & Safety. (2025). *Biological Agent Reference Sheet: Listeria monocytogenes*. <https://ehs.cornell.edu/research-safety/biosafety-biosecurity/biological-safety-manuals-and-other-documents/bars-other/listeria-monocytogenes>
- George Washington University Research Safety. (2025). *Pathogen Data Sheet: Listeria monocytogenes*. <https://researchsafety.gwu.edu/pathogen-data-sheets/listeria-monocytogenes>
- Emory University Environmental Health & Safety Office. (2025). *Biological Agent Reference Sheet: Listeria monocytogenes*. <https://ehso.emory.edu/sso/bars/listeria-monocytogenes.html>

Veterinary/Animal Work References

- World Organization for Animal Health (WOAH). (2021). *Listeriosis (Infection with Listeria monocytogenes)*. Terrestrial Manual. <https://www.woah.org>
- Radostits, O. M., Gay, C. C., Hinchcliff, K. W., & Constable, P. D. (2007). *Veterinary Medicine: A Textbook of the Diseases of Cattle, Horses, Sheep, Pigs and Goats* (10th ed.). Saunders Elsevier.

Acknowledgement of Working with *Listeria monocytogenes*

By signing below, I confirm that I have reviewed and understood the requirements for working with *Listeria monocytogenes*. I agree to comply with all outlined responsibilities, including:

- Following safe laboratory practices and use of appropriate PPE
- Applying proper first aid and decontamination procedures in the event of an exposure
- Promptly reporting any exposures, incidents, or safety concerns to my supervisor, Biosafety Officer, and Occupational Health

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*Identification: Provide your UCR Student ID, Employee ID, UCR NetID, UCR Email, or Date of Birth.