

# Listeriosis

## 1. DISEASE REPORTING

### A. Purpose of Reporting and Surveillance

1. To identify outbreaks and related cases.
2. To identify sources of contaminated food products and prevent further transmission from such sources.
3. To determine the public health impact of sources of contaminated food products.

### B. Legal Reporting Requirements

1. Health care providers: notifiable to local health jurisdiction within 24 hours.
2. Health care facilities: notifiable to local health jurisdiction within 24 hours.
3. Laboratories: notifiable to local health jurisdiction within 24 hours; specimen submission is required – culture (2 business days).
4. Local health jurisdiction: notifiable to the Washington State Department of Health (DOH) Communicable Disease Epidemiology Section (CDES) within 7 days of case investigation completion or summary information required within 21 days.

### C. Local Health Jurisdiction Investigation Responsibilities

1. Report all *confirmed* cases to CDES. Complete the listeriosis case report form (<http://www.doh.wa.gov/notify/forms/listeriosis.pdf>) and enter the data into the Public Health Issues Management System (PHIMS).
2. Obtain a detailed case food history using the CDC “Listeria Case Form” [http://www.cdc.gov/nationalsurveillance/PDFs/ListeriaCaseReportFormOMB0920-0004\\_alfalfa.pdf](http://www.cdc.gov/nationalsurveillance/PDFs/ListeriaCaseReportFormOMB0920-0004_alfalfa.pdf)
3. Fax completed food history to CDES at 206-418-5515

## 2. THE DISEASE AND ITS EPIDEMIOLOGY

### A. Etiologic Agent

*Listeria monocytogenes* are gram-positive rods that cause infection primarily in pregnant women, newborns, the elderly and immunocompromised persons. Both sporadic cases and outbreaks have occurred among immunocompetent persons associated with a very highly contaminated food product. It is estimated that up to 5% of the population may carry *L. monocytogenes* in their gastrointestinal tract without any symptoms of listeriosis.

### B. Description of Illness

The presentation of listeriosis depends on the host. Immunocompromised, neonatal, and elderly persons usually present with sepsis and meningitis. In pregnant women, listeriosis may manifest as a flu-like illness (i.e., fever, headache, and muscle aches) and may cause miscarriages, preterm births, or stillbirths. Immunocompetent persons may experience an acute febrile gastroenteritis.

The case fatality rate for invasive listeriosis is high; 30–50% of infants infected prenatally and more than 60% among adults aged 60 years or older. Most cases of listeriosis are sporadic; however outbreaks associated with consumption of contaminated foods have occurred.

### C. Listeriosis in Washington State

DOH has received 12 to 25 reports of listeriosis per year during recent years.

### D. Reservoirs

*L. monocytogenes* are common in the environment. The organism is easily recovered from soil, water, sewage, vegetation, silage, commercial meat, and dairy products. Domestic and wild mammals, birds, and man may be asymptomatic carriers of *Listeria* in their intestinal flora. Up to 5% of humans may be excreting *L. monocytogenes* in their stools at any given time, although person-to-person transmission is rare.

### E. Modes of transmission

Listeriosis is primarily a foodborne infection. Consuming contaminated food items has been identified as the source of infection in both sporadic and outbreak-associated cases. *Listeria* can be found in a variety of foods, including soft cheeses (e.g. Brie, Mexican-style fresh cheeses, Camembert, Roquefort, Bleu), hot dogs and other ready to eat meats, smoked fish, lettuce, coleslaw, other salad items, ready-to-eat foods purchased from store delicatessens, and raw milk. Cross-contamination of ready-to-eat foods may also play a role in transmission. *Listeria* contamination commonly causes food product recalls.

Women infected during pregnancy may pass *L. monocytogenes* to the fetus, either transplacentally or at birth. Infection in a fetus may result in stillbirth or preterm delivery while infection in a neonate may present as meningitis or septicemia. Rare outbreaks in neonatal nurseries have been attributed to contaminated equipment or materials.

### F. Incubation period

The incubation period is not known with certainty but probably ranges from 3–70 days with an estimated median incubation period of 3 weeks.

### G. Period of communicability

Person-to-person transmission, other than from mother to fetus or newborn, is rare. Mothers of infected newborns can shed the agent in vaginal discharges and urine for 7–10 days after delivery.

Asymptomatic carriage of *L. monocytogenes* is well documented and infected individuals can shed the organism in stools for several months, however secondary infection among household contacts has not been identified.

### H. Treatment

Treatment with antibiotics for infections diagnosed during pregnancy may prevent fetal or neonatal infections.

### 3. CASE DEFINITIONS

#### A. Clinical Criteria for Diagnosis

In adults, invasive disease caused by *Listeria monocytogenes* manifests most commonly as meningitis or bacteremia; infection during pregnancy may result in fetal loss through miscarriage or stillbirth, or neonatal meningitis or bacteremia. In pregnant women, symptoms may be mild and non-specific.

#### B. Laboratory Criteria for Diagnosis

1. Isolation of *L. monocytogenes* from a normally sterile site (e.g., blood or cerebrospinal fluid [CSF] or, less commonly, joint, pleural, or pericardial fluid).
2. In the setting of miscarriage or stillbirth, isolation of *L. monocytogenes* from placental or fetal tissue.

#### C. Case Definition (1999)

*Confirmed*: a clinically compatible case that is laboratory confirmed.

### 4. DIAGNOSIS AND LABORATORY SERVICES

#### A. Diagnosis

The diagnosis of listeriosis is most commonly made by isolation of *L. monocytogenes* from a normally sterile site. Serologic testing is not useful in diagnosing acute invasive disease, but can be useful in detecting noninvasive disease (asymptomatic disease, gastroenteritis) in an outbreak or in other epidemiological investigations. The usefulness of other laboratory methods such as fluorescent antibody testing or polymerase chain reaction to diagnose invasive listeriosis has not been established. Stool testing is not commercially available.

#### B. Tests Available at DOH Public Health Laboratories (PHL)

Laboratories in Washington are required to submit *Listeria* isolates to PHL. PHL perform serotyping and pulsed-field gel electrophoresis (PFGE) on all submitted isolates. Finding isolates with the same PFGE pattern may be consistent with but does not prove a common source, whereas isolates with different PFGE patterns presumptively came from different sources. PHL can provide isolate confirmation for *L. monocytogenes* if needed.

Note that PHL requires all clinical specimens have two patient identifiers, a name **and** a second identifier (e.g., date of birth) both on the specimen label and on the submission form. Due to laboratory accreditation standards, specimens will be rejected for testing if not properly identified. Also include specimen source and collection date.

#### C. Specimen Collection

Isolates should be submitted to PHL on media that support its growth. In the event of an outbreak, contact CDES for assistance in determining which specimens should be collected for laboratory study. Include the DOH Reference Bacteriology form: <http://www.doh.wa.gov/EHSPHL/PHL/Forms/Microbiology.pdf> with all specimens.

## 5. ROUTINE CASE INVESTIGATION

Interview the case and others who may be able to provide pertinent information.

### A. Evaluate the Diagnosis

Determine the clinical presentation (e.g., septicemia, meningitis), onset date and risk factors (e.g., pregnant, immunocompromised, neonatal).

### B. Identify Source of Infection

Ask especially about the following exposures in the 3–70 days prior to onset:

1. Consumption of unpasteurized milk or unpasteurized dairy products (e.g. cheeses made with raw milk)
2. Consumption of prepackaged, ready-to-eat meat (e.g., hot dogs, turkey, bologna)
3. Consumption of refrigerated, prepared foods, or any foods from a deli
4. Consumption of dried, preserved or traditionally prepared meats (e.g., sausage, salami, jerky) or preserved, smoked, or traditionally prepared fish
5. Contact with animals or animal products

Outbreaks of Listeriosis from commercial food products are difficult to detect due to long incubation periods and low attack rates. In order to increase the likelihood of identifying a contaminated product, obtain a detailed food history using the CDC “Listeria Case Form” that is used for national listeriosis surveillance:

[http://www.cdc.gov/nationalsurveillance/PDFs/ListeriaCaseReportFormOMB0920-0004\\_alfalfa.pdf](http://www.cdc.gov/nationalsurveillance/PDFs/ListeriaCaseReportFormOMB0920-0004_alfalfa.pdf)

Fax the completed food history form to CDES at 206-418-5515

### C. Environmental Evaluation

An environmental evaluation is usually not needed since the source of the infection is rarely determined with certainty. Contact CDES if you have high suspicion for a source of infection.

## 6. CONTROLLING FURTHER SPREAD

### A. Infection Control Recommendations

1. Hospitalized patients should be treated using standard precautions.
2. To prevent the possible spread in nurseries, strict hand washing by personnel should be enforced.
3. Food handlers, child care providers, and health care personnel with diarrhea should be excluded from work while symptomatic; however, no specific measures are needed to prevent or control transmission from asymptomatic *Listeria* carriers.

### B. Case Management

No further case follow-up needed after infection control recommendations made.

### C. Contact Management

With the exception of mother-to-fetus/newborn, person-to-person transmission of listeriosis is rare.

## D. Environmental Measures

Regulatory agencies (e.g., Washington State Department of Agriculture) enforce U.S. laws regarding the presence of *L. monocytogenes* in ready-to-eat foods. In outbreak situations, implicated food products will be recalled.

## 7. MANAGING SPECIAL SITUATIONS

### A. Outbreaks

Although rare, listeriosis outbreaks are important to identify and investigate because of the life-threatening nature of the disease and the likelihood that there is a continuing common source of infection in the community. Such investigations require special questionnaires and active surveillance, and may involve complex environmental evaluations. Consult with CDES before beginning any special investigation.

## 8. ROUTINE PREVENTION

**A. Vaccine Recommendations:** No vaccine is available.

### B. Prevention Recommendations

(available at: <http://www.cdc.gov/nczved/divisions/dfbmd/diseases/listeriosis/>)

1. General recommendations for all persons:
  - Thoroughly cook raw food from animal sources, such as beef, pork, or poultry.
  - Wash raw vegetables thoroughly before eating.
  - Keep uncooked meats separate from vegetables and from cooked foods and ready-to-eat foods.
  - Avoid unpasteurized (raw) milk or foods made from unpasteurized milk.
  - Wash hands, knives, and cutting boards after handling uncooked foods.
  - Consume perishable and ready-to-eat foods as soon as possible.
2. Recommendations for persons at high risk, such as pregnant women and persons with weakened immune systems, in addition to the recommendations listed above:
  - Do not eat hot dogs, luncheon meats, or deli meats, unless they are reheated until steaming hot.
  - Avoid leftover foods or ready-to-eat foods from delicatessen counters, unless heated/reheated to steaming hot before eating.
  - Avoid getting fluid from hot dog packages on other foods, utensils, and food preparation surfaces, and wash hands after handling hot dogs, luncheon meats, and deli meats.
  - Do not eat soft cheeses such as feta, Brie, Camembert, blue-veined cheeses, or Mexican-style cheeses (e.g., queso blanco, queso fresco, Panela); unless they have labels that clearly state they are made from pasteurized milk.
  - Do not eat refrigerated pâtés or meat spreads. Canned or shelf-stable pâtés and meat spreads may be eaten.

- Do not eat refrigerated smoked seafood, unless it is contained in a cooked dish, such as a casserole. Refrigerated smoked seafood, such as salmon, trout, whitefish, cod, tuna or mackerel, is most often labeled as "nova-style," "lox," "kippered," "smoked," or "jerky." The fish is found in the refrigerator section or sold at deli counters of grocery stores and delicatessens. Canned or shelf-stable smoked seafood may be eaten.

## ACKNOWLEDGEMENTS

This document is a revision of the Washington State Guidelines for Notifiable Condition Reporting and Surveillance published in 2002 which were originally based on the Control of Communicable Diseases Manual (CCDM), 17<sup>th</sup> Edition; James Chin, Ed. APHA 2000. We would like to acknowledge the Oregon Department of Human Services for developing the format and select content of this document.

## UPDATES

### 2010 revisions:

**Sections 1c and Section 5:** Adds request to obtain food history using CDC Listeria Case Report Form for all confirmed cases. These reports are part of national surveillance to detect contaminated commercial products distributed to multiple jurisdictions.

**Section G:** Adds second paragraph on asymptomatic carriage.

**Sections 1c.3 and Section 5b:** Adds link to CDC supplemental form (revised 2010).

### January 2011:

The Legal Reporting Requirements section has been revised to reflect the 2011 Notifiable Conditions Rule revision.