

# Listeriosis

## Investigative Guidelines

### August 2019

#### 1. DISEASE REPORTING

##### 1.1 Purpose of Reporting and Surveillance

1. To identify outbreaks and potential sources or sites of ongoing transmission.
2. To identify other cases.
3. To educate people about how to reduce their risk of infection.
4. To better characterize the epidemiology of this infection.

##### 1.2 Laboratory and Physician Reporting Requirements

Physicians and laboratories are required to report cases to the local public health authority (LPHA) within one working day; laboratories must submit isolates to the Oregon State Public Health Laboratory (OSPHL).

##### 1.3 Local Health Department Reporting and Follow-Up Responsibilities

1. Report all confirmed and presumptive (but *not* suspect) cases to the Oregon Health Authority (OHA) by the end of the calendar week of initial physician or lab report. Use Orpheus or the standard case-report form.
2. Begin follow-up investigation within one working day. Use Orpheus or the [Listeriosis case-report form](#) with the CDC Listeriosis Supplement (available in [English](#) and in [Spanish](#)). Enter all data into Orpheus by the end of the week.
3. As indicated, complete OHA summary forms for foodborne outbreaks ([available here](#)) when investigation is complete.

#### 2. THE DISEASE AND ITS EPIDEMIOLOGY

##### 2.1 Etiologic Agent

*Listeria monocytogenes* is a Gram-positive bacillus. The serotypes isolated most frequently from humans in the U.S. include 1/2a, 1/2b and 4b.

##### 2.2 Description of Illness

Listeriosis is primarily an illness of pregnant women, newborns, the elderly and immunocompromised persons, though both sporadic cases and outbreaks have occurred in immunocompetent hosts. Listeriosis may consist of only an influenza-like illness with fever, headache and myalgias. Rarely, outbreaks of *Listeria* gastrointestinal illness with flu-like symptoms plus diarrhea

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(approximately 68% in four reported outbreaks) and vomiting (in 35%) have been reported. Invasive listeriosis produces sepsis or meningitis. In pregnant women, listeriosis may cause miscarriages or stillbirths. The case fatality of invasive listeriosis may be as high as 30% in infants infected prenatally, and 25%–30% in non-pregnant adults.

Most cases of listeriosis are sporadic rather than epidemic. However, several large outbreaks have been associated with consumption of contaminated foods.

### 2.3 Reservoirs

*L. monocytogenes* is common in the environment. It 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.

### 2.4 Sources and Routes of Transmission

*L. monocytogenes* is primarily a foodborne infection. Consumption of contaminated food items has been identified as the source of infection in both sporadic and outbreak-associated cases. The largest recorded outbreak of listeriosis to date was associated with eating Mexican-style soft cheese. Other important outbreaks have been caused by contaminated cantaloupe and ice cream.

*Listeria* can be found in a variety of foods, including cheeses (especially Brie, Camembert, Roquefort, Bleu), hot dogs, lettuce, coleslaw and other salad items, ready-to-eat foods purchased from store delicatessens, and in raw milk. Cross-contamination of ready-to-eat foods may also play a role in transmission.

Women who are infected during pregnancy may pass *L. monocytogenes* to the fetus, either transplacentally or at birth. Infection in the fetus may manifest as stillbirth, or as meningitis or sepsis in the neonate. Transmission in neonatal nurseries, presumably on the hands of medical or nursing staff, has been documented.

### 2.5 Incubation Period

Incubation periods for listeriosis can vary considerably. A [2016 analysis](#) of all U.S. outbreak-related listeriosis cases reported to CDC from 1985 to 2015 yielded a median incubation period of 11 (range, 0–70) days. Several large outbreaks both domestically and abroad have had median incubation periods ranging from 3 to 31 days.

### 2.6 Period of Communicability

Person-to-person transmission, other than from mother to fetus or newborn, is rare.

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### 2.7 Treatment

The optimal therapy for listeriosis has not been established in controlled trials. A combination of ampicillin and an aminoglycoside (gentamicin) is usually used. In the case of *Listeria meningitis*, providers should avoid the concomitant use of dexamethasone, as it has been associated with worse outcomes. In penicillin-allergic patients, sulfamethoxazole/trimethoprim or meropenem may be used. Ampicillin is the preferred treatment for maternal-fetal listeriosis.

## 3. CASE DEFINITIONS, DIAGNOSIS AND LABORATORY SERVICES

### 3.1 Confirmed Case Definition

1. Person from whom *Listeria monocytogenes* is isolated from a normally sterile site, usually blood or cerebrospinal fluid, **or during a point-source outbreak, from stool**;
2. Mother from whom *L. monocytogenes* is isolated from placenta (or other products of conception, e.g., amniotic fluid or umbilical cord blood) at the time of delivery in the setting of pregnancy, pregnancy loss, intrauterine fetal demise, or birth; OR
3. Neonate from whom *L. monocytogenes* is isolated from a non-sterile specimen (e.g., meconium or tracheal aspirate – NOT products of conception) collected within 48 hours of delivery.

### 3.2 Presumptive Case Definition

1. Person from whom *L. monocytogenes* is detected by culture-independent diagnostic testing (CIDT) from a normally sterile site, usually blood or cerebrospinal fluid;
2. Mother:
  - From whom *L. monocytogenes* is detected by CIDT from placenta (or other products of conception, e.g., amniotic fluid or umbilical cord blood) at the time of delivery in the setting of pregnancy, pregnancy loss, intrauterine fetal demise, or birth, OR
  - Who gave birth to a neonate who meets confirmatory or presumptive laboratory evidence via specimens collected up to 28 days after birth; OR
3. Neonate:
  - From whom *L. monocytogenes* is detected by CIDT from a non-sterile specimen (e.g., meconium or tracheal aspirate – NOT products of conception) collected within 48 hours of delivery, OR
  - Whose mother meets confirmatory or presumptive laboratory evidence for diagnosis from products of conception, OR
  - Whose clinical picture is compatible and whose mother meets confirmatory or presumptive evidence for diagnosis from specimens collected from a normally sterile site.

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### 3.3 Suspect Case (not reportable to PHD)

Anyone with an influenza-like illness (fever, headache, myalgia) or sepsis or meningitis and supportive laboratory evidence (*Listeria* isolated from a source other than those mentioned above, e.g., urine, stool, or wound); or a pregnant woman with a miscarriage or stillbirth and supportive laboratory evidence.

### 3.4 Services Available at the Oregon State Public Health Laboratory (OSPHL)

OSPHL provides isolate confirmation for *L. monocytogenes*. Clinical laboratories are required to forward isolates to OSPHL. Submit isolates on an agar slant or plate media; refrigerate but do NOT freeze.

For complete specimen submission requirements, see the OSPHL Test Menu at [www.healthoregon.org/labtests](http://www.healthoregon.org/labtests).

In the event of an outbreak, contact OHA epidemiologists for assistance in determining which additional specimens should be collected for laboratory study.

Serologic testing is unreliable because of cross-reactivity with other bacterial species, and it is not readily available. OSPHL does not perform testing of food samples.

## 4. ROUTINE CASE INVESTIGATION

Interview all cases or their surrogates who may be able to provide pertinent information.

### 4.1 Clinical Data

Collect the following data for each case:

- Presence of symptoms. If yes, onset date.
- If case is hospitalized: name of hospital, date of admission and discharge. If transferred to another hospital: hospital name.
- Outcome.
- Clinical illness: sepsis, meningitis, amnionitis, etc.
- Whether patient is pregnant, is immunocompromised or has underlying medical conditions (e.g., cancer) or is taking corticosteroids or chemotherapy.
- If previously pregnant during the likely window of exposure and incubation: pregnancy outcome.
- Whether the fetus or neonate had culture-confirmed listeriosis. If yes, determine the type of infection — meningitis, bacteremia, sepsis, etc.

### 4.2 Identify Possible Source of Infection

Collect name, age, onset date, and contact information of people with similar illness.

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Since 2004, we have asked that you conduct a detailed supplemental interview with all cases (or their proxies). For most people this will take 20–40 minutes. This is part of a CDC and multi-state effort to better identify and solve outbreaks, which may stem from widely distributed commercial products.

*Listeria* has a long incubation period, making it difficult to recognize outbreaks in a timely manner. Cases are often widely scattered, with no more than one or two in any single state. Furthermore, the specificity of whole genome sequencing (WGS) is now linking cases with large temporospatial differences. Predictably, interviewing cases about specific food exposures months after the fact has proven frustrating; so thorough exposure interviews must be conducted as soon as possible after cases are reported.

The information you collect on this supplemental questionnaire, which was developed by CDC in consultation with a number of states, is used to assess potential vehicles, should the case later be determined to be part of an outbreak. Take a few minutes to familiarize yourself with the questionnaire before you use it! If you have any questions, give OHA epidemiologists a call.

### 5. CONTROLLING FURTHER SPREAD

Except for vertical transmission, person-to-person transmission of listeriosis is rare. To prevent spread in nurseries, strict hand washing by personnel should be enforced. In addition, 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 carriers.

### 6. MANAGING SPECIAL SITUATIONS

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. However, such investigations are difficult, require special questionnaires and active surveillance, and may involve complex environmental evaluations. Consultation with OHA epidemiologists is essential before beginning any special investigation.

### UPDATE LOG

August 2019: Corrected spelling and grammar errors. Updated instructions for submission of specimens and isolates to OSPHL. Updated section, “Purpose of Reporting and Surveillance.” (Ryan Monroe)

August 2016: Placed into new template and corrected spelling and link errors. Added reporting via Orpheus application; changed reporting time from one week to one working day. Updated statement regarding antibiotic treatments. (Leslie Byster, Beletshachew Shiferaw)

September 2010: Update style