Listeriosis
Investigation Guideline

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Attachments can be accessed through the Adobe Reader's navigation panel for attachments. Throughout this document attachment links are indicated by this symbol ; when the link is activated in Adobe Reader it will open the attachments navigation panel. The link may not work when using PDF readers other than Adobe.
**Revision History:**

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<td>Updated format and web links. Updated Notification sections and Isolation with updated regulations.</td>
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<td>Added notification section; fixed minor typos. Modified laboratory and case investigation sections concerning submission of isolates. Removed references to KS-EDSS in 02/2012.</td>
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CASE DEFINITION – (CDC 2000)

Clinical Description for Public Health Surveillance:

- 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. Other manifestations may also be observed.

Laboratory Criteria for Case Classification:

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

Case Classification:

- **Confirmed:** A clinically compatible illness that is laboratory confirmed.
- **Probable:** Laboratory confirmed only. (KDHE defined classification).

LABORATORY ANALYSIS:

Kansas participates in the CDC Listeria Initiative. All *L. monocytogenes* isolates are to be forwarded to Kansas Health and Environmental Laboratories (KHEL) for subtyping through the National Molecular Subtyping Network (PulseNet).

- Shipping of isolates: Use a KHEL Miscellaneous Infectious Disease mailer
- For additional information: call (785) 296-1620.

EPIDEMIOLOGY

*L. monocytogenes* bacteria are widely distributed in nature, especially in the food chain. Most cases occur sporadically but foodborne and nosocomial outbreaks have been documented. Food associated with infection includes: unpasteurized milk, soft cheeses, processed meats and contaminated vegetables. Newborns, the elderly, immunocompromised persons and pregnant women are at greater risk of infection. About 30% of all cases occur to newborns within the first 3 weeks of life.
DISEASE OVERVIEW

A. Agent:
*L. Monocytogenes* is an aerobic gram-positive rod shaped bacterium.

B. Clinical Description:
Infections in healthy persons may appear as mild flu-like illness. Seen as meningoencephalitis or bacteremia in newborns and some adults, it may cause fever and abortion in pregnant women. Meningoencephalitis onset may be sudden with fever, headache, nausea, vomiting, and signs of meningeal irritation. Endocarditis, granulomatous lesions in the liver and other organs, localized internal or external abscesses, and pustular or papular cutaneous lesions may also occur. ~30% case-fatality rate seen in infected newborns.

C. Reservoirs:
Reservoirs for *L. monocytogenes* are soil, water, silage, mammals and fowl.

D. Mode(s) of Transmission:
*L. monocytogenes* may be acquired by the fetus in utero or during delivery. Listeria can also be transmitted through ingestion of contaminated foods or through contact with infected animals or birds. Person-to-person transmission has also been reported in nosocomial outbreaks.

E. Incubation Period:
Range 3-70 days; average 21 days.

F. Period of Communicability:
*L. monocytogenes* may be shed for months in the stool of infected persons, although person-to-person transmission is rare. Following delivery, mothers of infected newborns may shed *L. monocytogenes* for 7-10 days in vaginal secretions or urine.

G. Susceptibility and Resistance:
Fetuses and newborns are highly susceptible. Children and young adults are usually resistant; adults less so after age 40, especially the immunocompromised and the elderly. Disease is often superimposed on other illness such as cancer, organ transplant, diabetes and AIDS. There is no evidence of immunity after infection.

H. Treatment:
Penicillin or ampicillin alone or together with aminoglycosides. If case is allergic to penicillin, TMP-SMX or erythromycin is preferred. Cephalosporins are not effective. Tetracycline resistance has been observed.
NOTIFICATION TO PUBLIC HEALTH AUTHORITIES

Suspected cases of Listeriosis shall be reported within 24 hours, except if the reporting period ends on a weekend or state-approved holiday, the report shall be made by 5:00 p.m. on the next business day after the 24-hour period:

1. Health care providers and hospitals: report to the local public health jurisdiction or KDHE-BEPHI (see below)
2. Local public health jurisdiction: report to KDHE-BEPHI (see below)
3. Laboratories: report to KDHE-BEPHI (see below)

Kansas Department of Health and Environment (KDHE)
Bureau of Epidemiology and Public Health Informatics (BEPHI)

Phone: 1-877-427-7317
Fax: 1-877-427-7318

Further responsibilities of state and local health departments to the CDC:

As a nationally notifiable condition, confirmed and probable Listeriosis cases are ROUTINELY NOTIFIABLE to the Center of Disease Control and Prevention (CDC).

- Local public health jurisdiction will report information requested on the disease reporting forms as soon as possible, completing the forms within 5 days of receiving a notification of a report.
- KDHE-BEPHI will file an electronic case report the next regularly scheduled electronic transmission.
  (KDHE-BEPHI files electronic reports weekly with CDC.)

INVESTIGATOR RESPONSIBILITIES

1) Use current case definition, to confirm diagnosis with the medical provider.
   - Collect all information requested in Step 1 of case investigation.
   - Ensure that case/proxy is aware of the diagnosis.
2) Continue the case investigation to identify potential source of infection.
   - The Listeria Case Form may assist with data collection. [Please, note a specialized form may also need to be provided by the KDHE epidemiologist in charge of Listeria Surveillance.]
   - Start the Case Investigation within 3 days of receiving a notification.
   - Complete the case investigation within 5 days of receiving notification.
3) Identify whether the source of infection is major public health concern.
   - Example: commercially available food.
4) Conduct contact investigation only if a specific food has been incriminated.
5) Initiate control and prevention measures to prevent spread of disease.
6) Complete and report all information requested in the Kansas electronic surveillance system.
7) As appropriate, use notification letter(s) and the disease fact sheet to notify the case, contacts and other individuals or groups.
STANDARD CASE INVESTIGATION AND CONTROL METHODS

Case Investigation

1) Contact the medical provider who ordered testing of the case and obtain the following information.
- Collect patient’s demographics (address, birth date, gender, race/ethnicity, primary language, and phone number(s)). [Demographic]
- Record patient’s occupation [Epidemiologic]
- Examine the laboratory testing that was done: [Laboratory]
  - Note type of specimen, specimen collection date and submitting lab.
  - If Listeria was isolated; ensure the isolate is sent to KHEL (Examine the Isolate Submission field on the [Laboratory] Tab and the Notes tab to verify submission.)
- Record onset date of symptoms. [Clinical]
  - Symptoms include: fever; chills; headache; muscle aches; stiff neck; altered mental status, diarrhea; vomiting; preterm labor; other
- Record diagnose date. [Clinical]
- Record current treatment [Clinical]
- Record hospitalizations: including those hospitalizations that occurred 4 weeks before illness/delivery date, note location and duration of stay [Clinical]
- Record outcomes: survived or date of death [Clinical]
- For females, pregnancy status [Clinical]. For pregnancy associated illness, see specific instructions under Managing Special Situations.

2) Interview the case (or mother of neonatal infant) or proxy to determine source and risk factors; focus on incubation period 4 weeks prior to illness onset.
- Examine hospitalizations or residency in nursing homes, note date of admission or discharge.
- Travel history:
  - Travel outside of KS; list states visited; dates visited
  - Travel outside of U.S.; list country; date of departure and return to U.S.
- Food purchase history (Note locations and dining dates, as needed)
- Food consumption history (especially cold cuts, deli or luncheon meat and cheeses, ready-to-eat salads, seafood, fruits, and other dairy)
  - Collect information from case for the Contact Investigation. (See below).

3) Examining the epidemiological information:
- Record where the infection was most likely imported from. (Indigenous or out-of-county, state, or U.S.) [Epidemiologic].
- Highly suspected sources should be investigated.
- A detailed trace-back investigation may need to occur. The agency involved in traceback and inspections will depend on the source.
- For suspected Outbreaks refer to Managing Special Situations section.
Contact Investigation

Contacts are considered to be anyone exposed to a specific food identified as a likely source of contamination. Until a specific food has been incriminated, anyone sharing food with case can be considered a potential contact.

Isolation, Work and Daycare Restrictions

No isolation or restrictions in employment or school attendance required.

Case Management

None.

Contact Management

Antimicrobial therapy of infection diagnosed during pregnancy may prevent fetal or perinatal infections and its consequences.

Environmental Measures

1) Implicated food items must be removed from the environment.
2) A decision about testing implicated food items can be made in consultation with the state epidemiologist.
3) If a commercial product is suspected, the state health department will coordinate follow-up with relevant outside agencies.

Education

Inform people at higher risk, such as pregnant women and persons with weakened immune systems, of methods to avoid listeriosis, including:

- Avoid soft cheeses such as Brie, Camembert, and Mexican style cheeses.
- Avoid deli meats.
- Cook leftover foods or hot dogs until steaming hot.
- Thoroughly cook food from animal sources such as beef, pork, or poultry and consume only pasteurized dairy products.
- Avoid contact with potentially infective materials, such as aborted animal fetuses on farms.
- Thoroughly wash raw fruits and vegetables before eating.
- Wash hands, knives, and cutting boards after handling uncooked foods.
- Avoid the use of untreated manure on food crops.
MANAGING SPECIAL SITUATIONS

A. Outbreak Investigation:
   1) Outbreaks have been reported with the ingestion of contaminated food and as nosocomial infections in neonatal nurseries.
   2) A foodborne disease outbreak is defined in the following ways:
      • Two or more individuals (from different households) who experience a similar illness after eating a common food or food from a common place.
      • An unexplained, unexpected increase of a similar illness and food is a likely source.
   3) Notify KDHE immediately, 1-877-427-7317.
   4) Active case finding will be an important part of any investigation.
   5) References that will assist with investigations include:

B. For Pregnancy Associated Cases:
   1) Examine the laboratory testing; note type of specimen that grew *Listeria*; whether from the mother or neonate; collection date and submitting lab.
   2) Record outcome of pregnancy:
      • Still pregnant, fetal death, induced abortion, delivery, or other
      • Note week of gestation and date for the event
   3) Record the type of illness in the mother: bacteremia/sepsis, meningitis, febrile gastroenteritis, amnionitis, non-specific “flu-like” illness, none or other type of illness
   4) Record the type of illness in neonate: bacteremia/sepsis, meningitis, pneumonia, granulomatosis infantisepticum; none or other
   5) Note if mother and/or neonate were hospitalized for listeriosis:
      • Include admit and discharge dates
      • Record outcomes for mother and/or neonate: survived or date of d
   6) Collect case’s demographic data and contact information (birth date, county, sex, race/ethnicity, occupation, address, phone number(s))
   7) Collect information on the following:
      • Examine hospitalizations or residency in nursing homes, note date of admission or discharge.
      • Travel history:
         - Travel outside of KS; list states visited; dates of visit
         - Travel outside of U.S.; list country; date of departure and return
      • Record any symptoms and onset date: fever; chills; headache; muscle aches; stiff neck; diarrhea; vomiting; preterm labor; other or none
   8) Food consumption and purchase history for 4 weeks prior to mother’s onset date (or delivery date with no symptom onset).
DATA MANAGEMENT AND REPORTING TO THE KDHE

A. Accept the case assigned to the LHD and record the date the LHD investigation was started on the [Administrative] tab.

B. Organize and collect data, using appropriate data collection tools including:
   - The Listeria Case Form can be used to collect information.
   - Investigators can also enter all required information directly into EpiTrax [Investigation], [Clinical], [Demographics], [Epidemiological] tabs.

C. Report data collected during the course of the investigation via EpiTrax.
   - Verify that all data requested has been recorded on an appropriate EpiTrax [tab], or that actions are completed for a case lost to follow-up as outlined below.
   - Some data that cannot be reported on an EpiTrax [tab] may need to be recorded in [Notes] or scanned and attached to the record.
   - Paper report forms do not need to be sent to KDHE after the information is recorded and/or attached in EpiTrax. The forms should be handled as directed by local administrative practices.

D. If a case is lost to follow-up, after the appropriate attempts to contact the case have been made:
   - Indicate ‘lost to follow-up’ on the [Investigation] tab with the number of attempts to contact the case recorded.
   - Record at least the information that was collected from the initial reporter.
   - Record a reason for ‘lost to follow-up’ in [Notes].

E. After the requirements listed under Case Investigation have been completed, record the “Date LHD investigation completed” field located on the [Administrative] tab.
   - Record the date even if the local investigator’s Case or Contact Management for the contact is not “Complete”.

F. Once the entire investigation is completed, the LHD investigator will click the “Complete” button on the [Administrative] tab. This will trigger an alert to the LHD Administrator so they can review the case before sending to the state.
   - The LHD Administrator will then “Approve” or “Reject” the CMR.
   - Once a case is “Approved” by the LHD Administrator, BEPHI staff will review and close the case after ensuring it is complete and that the case is assigned to the correct event, based on the reported symptoms reported.
     (Review the EpiTrax User Guide, Case Routing for further guidance.)
ADDITIONAL INFORMATION / REFERENCES


C. Case Definitions: CDC Division of Public Health Surveillance and Informatics, Available at: www.cdc.gov/nndss/

D. Additional Information: https://www.cdc.gov/listeria/