Legionellosis Investigation Guideline

CONTENT:	VERSION DATE:
Investigation Protocol:	
• **Investigation Guideline**	**05/2014**
Supporting Materials found in attachments:	
• **Fact Sheet**	**05/2014**

Revision History:

Date	Replaced	Comments
05/2014	05/2013	Edited notification section in association to travel/hotel related notifications.
05/2013	09/2009	Added notification section
02/2012	-	Removed references to KS-EDSS.

Legionellosis
Disease Management and Investigative Guidelines

CASE DEFINITION (CDC 2005)

Clinical Description for Public Health Surveillance:
Legionellosis is associated with two clinically and epidemiologically distinct illnesses:

- Legionnaires' disease, which is characterized by fever, myalgia, cough, and clinical or radiographic pneumonia; and
- Pontiac fever, a milder illness without pneumonia.

Laboratory Criteria for Case Classification:
Confirmatory lab results:

- By culture: isolation of any *Legionella* organism from respiratory secretions, lung tissue, pleural fluid, or other normally sterile fluid.
- By detection of *Legionella pneumophila* serogroup 1 antigen in urine using validated reagents.
- By seroconversion: fourfold or greater rise in specific serum antibody titer to *Legionella pneumophila* serogroup 1 using validated reagents.

Suspect (presumptive) lab results:

- By seroconversion: fourfold or greater rise in antibody titer to specific species or serogroups of *Legionella* other than *L. pneumophila* serogroup 1 (e.g., *L. micdadei*, *L. pneumophila* serogroup 6).
- By seroconversion: fourfold or greater rise in antibody titer to multiple species of *Legionella* using pooled antigen and validated reagents.
- By the detection of specific *Legionella* antigen or staining of the organism in respiratory secretions, lung tissue, or pleural fluid by direct fluorescent antibody (DFA) staining, immunohistochemistry (IHC), or other similar method, using validated reagents.
- By detection of *Legionella* species by a validated nucleic acid assay.

Case Classification:

- **Confirmed:** a clinically compatible case that meets at least one of the confirmatory laboratory criteria.
- **Suspect:** a clinically compatible case that meets at least one of the presumptive (suspect) laboratory criteria.
- **Travel-associated**: a suspect or confirmed case that has a history of spending at least one night away from home, either in the same country of residence or abroad, in the ten days before onset of illness.

LABORATORY ANALYSIS

Isolates are not required to be sent to the State Public Health Laboratory (KHEL); but they are equipped to confirm isolates of *Legionella spp*. Specimens for *Legionella* testing will be forwarded to the CDC <u>only after</u> prior clearance by the CDC Respiratory Diseases Branch.

- When sending isolates to the state laboratory:
    - Contact the laboratory at 785-620-1620.
    - Use IDS (infectious disease shipper) for shipping.
- When sending serology, urine, or pathologic specimens for testing at the CDC:
    - Contact the Epidemiology services for approval at 1-877-427-7317.

- An epidemiologist will request the information needed to verify an outbreak related case or if other special circumstances exist in which the CDC would need to assist. The epidemiologist will contact the Respiratory Disease Branch within the CDC Division of Bacterial Disease at 404-639-2215.
- After approval, specimen collection and delivery instructions will be given.

Note: For serology, paired serum specimens taken at least 14 days apart are required. A single antibody titer at any level is not diagnostic to Legionellosis.

For additional information concerning collection or sample transport, call (785) 296-1620 or refer to guidance at www.kdheks.gov/labs/lab_ref_guide.htm

EPIDEMIOLOGY

Legionellosis has a worldwide distribution. In the United States an estimated 8,000 - 18,000 cases occur annually; most are isolated and are not associated with outbreaks. Outbreaks usually occur in the summer and fall, although cases may occur year-round. Serologic surveys show a prevalence of antibodies to *L. pneumophila* serogroup 1 in up to 20% of the population. Risk factors include increased age (i.e., >50 years), cigarette smoking, chronic lung disease and immunosuppressive therapy. *Legionella* accounts for 0.5- 5% of community-acquired pneumonias each year.

DISEASE OVERVIEW

A. Agent:

Legionellosis is an illness caused by *Legionella* species. There are many serogroups, but serogroup 1 is the most frequently linked with serious illness.

B. Clinical Description:

Legionellosis is associated with two distinct illnesses:

- Legionnaire's disease characterized by fever, myalgia, cough, and pneumonia.
  - Legionnaires' disease has a case-fatality rate of 5-30%
- Pontiac fever is a milder form of illness without pneumonia. The most common symptoms are anorexia, myalgia, malaise and headache. This is followed by fever, chills and a non-productive cough. Other symptoms include abdominal pain and diarrhea.
  - Pontiac fever cases usually recover in 2-5 days without treatment.

C. Reservoirs:

Legionella is commonly found in aquatic environments. Outbreaks and sporadic cases have been linked to air conditioning cooling towers, evaporative condensers, humidifiers, whirlpool spas, respiratory therapy devices, decorative fountains and potable water systems.

D. Mode(s) of Transmission:

Legionellosis is transmitted via aerosols inhaled from a contaminated water source or through aspiration. The organism can survive in water between 68- 176° F and is resistant to typical levels of chlorination. It is not transmissible person-to-person.

E. Incubation Period:

- Legionnaire disease: 2-10 days; average 5-6 days.
- Pontiac fever: 5 hours to 3 days; average 1-2 days.

F. Period of Communicability: None.

G. Susceptibility and Resistance:
Those most susceptible to disease are of increased age (i.e., >50) and a history of cigarette smoking, chronic lung disease and/or a history of immunosuppressive therapy or disease. There is evidence of lifetime immunity to specific strains.

H. Treatment:
Erythromycin is the preferred treatment. If illness progresses, Rifampin may be added. Alternative antimicrobials such as Azithromycin and Levofloxacin may also be used.

NOTIFICATIONS

Legionellosis shall be designated as infectious or contagious in their nature, and cases or suspect cases shall be reported within seven days:

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, legionellosis cases require a STANDARD *report 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 7 days of receiving a notification of a report.
  - **For travel associated cases** or **nosocomial cases,** the Local public health jurisdiction will notify KDHE-BEPHI by phone at 1-877-427-7317.
- KDHE-BEPHI will file an electronic case report the next regularly scheduled electronic transmission.
  (KDHE-BEPHI files electronic reports weekly with CDC.)
  - **For travel associated cases,** KDHE-BEPHI will notify the CDC by emailing travellegionella@cdc.gov.

Travel-associated notifications:

- After receiving a notification that a Kansas lodging facility may be associated to a travel-associated legionellosis case, KDHE-BEPHI will notify the facility management by mail.

Nosocomial-associated notifications:

- All medical facilities that are associated to a potential nosocomial case of legionellosis will be contacted by the KDHE-BEPHI Healthcare-Associated Infections Program.

INVESTIGATOR RESPONSIBILITIES

1) Use current case definition, to confirm diagnosis with the medical provider.
2) Conduct case investigation to collect information on potential sources of infection.
3) Only if a particular source is considered highly likely to be the cause of illness (i.e. additional cases associated with a common source or a single nosocomial case in hospitalized patient), conduct a more detailed contact investigation and investigate possible environmental measures to control and prevent disease.
4) For suspected travel associated cases, contact the KDHE immediately at 1-877-427-7317 to report suspicions.
5) Complete and report information requested in the EpiTrax system.
6) As appropriate, use the 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 reported or ordered testing of the case.
   - Obtain information from the provider or medical chart.
     - If patient hospitalized, obtain medical records.
   - Note the symptoms and onset date, especially: fever (note maximum temperature); myalgia, cough, or pneumonia
   - Examine the laboratory testing that was done.
   - Collect case's demographic data and contact information (birth date, county, sex, race/ethnicity, occupation, address, phone number(s))
   - Record hospitalizations (including those 10 days prior onset): location, dates
   - Record outcomes: survived or date of death
   - Note pre-existing conditions: alcoholism; smoking; diabetes; any chronic disease; immunodeficiency; organ transplant; malignancy
2) Interview the case to determine source and risk factors:
   - Focus on incubation period 2 weeks prior to illness onset.
   - Record any travel or overnight stay somewhere other than usual residence; note city and lodging information.
   - Record any dental work, note name of dental office.
   - Record any hospital visits; note name of hospital.
   - Record any work in a hospital; note name of hospital.
3) Consider if a case is hospital related (nosocomial):
   - Not nosocomial: no hospital visit (in and out-patient) 10 days prior to onset.
   - Possibly nosocomial: hospitalized 2-9 days before onset of infection.
   - Definitely nosocomial: hospitalized continuously for $\geq$10 days before onset.
   - Notify KDHE (877-427-7317) of any suspicion of nosocomial association.
4) For cases that have any travel or overnight stay 10 days before illness onset:
   - Notify KDHE (877-427-7317) of any travel association within 7 days of initial report of local health department receiving a report of Legionellosis.
   - KDHE will notify the CDC within 7 days after receiving a notification.
   - When epi-linked cases are identified, the CDC and state will assist the local

investigator in investigating the cases and locations.

5) Investigate epi-links among cases (clusters, household, co-workers, etc).
   - Highly suspected sources should be investigated.
   - For suspected outbreaks refer to Managing Special Situations section.

Contact Investigation

Contacts are only at risk if they are exposed to the same source.

A detailed contact and environmental investigation will only be completed if a particular source is considered highly likely to be the cause of illness among groups of people or in hospital settings.

The CDC and its web resources will be used to guide the investigation. Refer to www.cdc.gov/legionella/index.html for more information.

Isolation, Work and Daycare Restrictions

None

Case Management

None

Contact Management

None; unless required as part of an active investigation with state and/or CDC.

Environmental

It should be noted that routine surveillance of environmental sources is not recommended because of the high prevalence of the organism in the environment, the number of potential sources and the frequency of environmental bacteria in the absence of clinical disease.

The following measures are recommended:

- Cooling towers should undergo regular maintenance and should be drained when not in use. Appropriate biocides should be used to limit the growth of slime-forming organisms.
- Where clinical cases are linked to a likely environmental source, sampling may be considered. Consult with KDHE at 1-877-427-7317.
- If it is necessary to attempt to eliminate *L. pneumophila* from a cooling tower or potable water system the most effective methods are heating to 140° F, and/or hyperchlorination.
- Tap water should not be used for respiratory therapy devices.

Refer to www.cdc.gov/legionella/index.html for more information.

MANAGING SPECIAL SITUATIONS

A. Outbreak Investigation:

1) Outbreak definition:
   - A single documented nosocomial case in a hospital or other care facility should be investigated as a potential outbreak until a source has been identified and decontaminated or until additional cases have been ruled out.
   - In outbreaks, cases are clustered in time and place among groups that share a common air space. Most cases are sporadic and a complete environmental investigation is not necessary.
2) Notify KDHE immediately, 877-427-7317.
3) Active case finding will be an important part of any investigation.
4) Recommendations will be made based on the CDC guidance.
5) Refer to www.cdc.gov/legionella/index.html for more information.

DATA MANAGEMENT AND REPORTING TO THE KDHE

A. Organize and collect data.

B. Report data via the state electronic surveillance system.
- Especially data that collected during the investigation that helps to confirm or classify a case.

ADDITIONAL INFORMATION / REFERENCES

A. Treatment / Differential Diagnosis: American Academy of Pediatrics. 2006 Red Book: Report of the Committee on Infectious Disease, 27th Edition. Illinois, Academy of Pediatrics, 2006.

B. Epidemiology, Investigation and Control: Heymann. D., ed., Control of Communicable Diseases Manual, 18th Edition. Washington, DC, American Public Health Association, 2004.

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

D. Kansas Regulations/Statutes Related to Infectious Disease: www.kdheks.gov/epi/regulations.htm

E. Additional Information (CDC): www.cdc.gov/health/default.htm
- Legionellosis Resource Site: www.cdc.gov/legionella/index.html

ATTACHMENTS

- **Fact Sheet**

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