

Respiratory and Direct Contact

Legionellosis

Date Reviewed: February, 2011

Section: 2-70

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Notification Timeline:

From Lab/Practitioner to Public Health: Within 48 hours.

From Public Health to Ministry of Health: Within 3 days.

Immediate if outbreak is suspected or if single nosocomial or occupational case.

Public Health Follow-up Timeline: Initiate within 24 to 48 hours.

Information

Case Definition (Public Health Agency of Canada, May 2008)

Table 1. National Case Definition for Legionellosis	
Confirmed Case	Clinical illness* with laboratory confirmation of infection: - isolation of <i>Legionella</i> species or detection of the antigen from respiratory secretions, lung tissue, pleural fluid or other normally sterile fluids OR - a significant (e.g., fourfold or greater) rise in <i>Legionella</i> species IgG titre between acute and convalescent sera OR - IgG titre > 1:128 against <i>Legionella</i> species OR - demonstration of <i>L. pneumophila</i> antigen in urine
Probable Case	Clinical illness* with demonstration of <i>Legionella</i> species DNA.
*Legionellosis comprises two distinct illnesses: Legionnaires' disease, characterized by fever, myalgia, cough and pneumonia, and Pontiac fever, a milder illness without pneumonia.	

Causative Agent

Some species of *Legionella*, a genus of Gram-negative bacilli. Over 35 species have been described, but most cases of legionellosis are caused by *L. pneumophila* serogroup 1.

Symptoms

Legionellosis is an acute bacterial infection and there are two manifestations recognized: Legionnaire's disease and Pontiac fever.



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Initial Symptoms for both Manifestations	Pontiac Fever ¹	Legionnaire's Disease
• Fever and chills. Temperatures can reach 39°C-40.5°C. • Myalgia. • Anorexia. • Malaise. • Headache. • Nonproductive cough, abdominal pain and diarrhea may also be present.	• No pneumonia or multi system involvement. • Patients generally recover in two to five days without treatment.	• Chest x-ray is usually consistent with pneumonia. • May progress to multi-system failure with confusion, disorientation, increasing respiratory distress and disseminated legionellosis. • Death may occur especially in persons with pre existing medical conditions or a depressed immune system.

Incubation Period

- Legionnaire's disease 2-10 days usually 5-6 days.
- Pontiac fever 5-66 hours, usually 24-48 hours.

Reservoir/Source

The bacterium is ubiquitous in nature and is primarily aquatic. Hot water systems (i.e., showers), air conditioning cooling towers, evaporative condensers, humidifiers, whirlpool spas, respiratory therapy devices and decorative fountains have all been implicated in causing disease and outbreaks.

¹ Believed to be caused by a reaction to inhaled antigen rather than bacterial invasion. Pontiac fever has only been recognized during outbreaks.



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The bacteria have been isolated from water found in the previously mentioned areas as well as from water in taps, hot tubs, and from creeks, ponds and the soil of their banks. It has been known to survive for months in tap and distilled water. The organism can survive for years in water at 2°C to 8°C and is resistant to usual levels of chlorination (Mandell, 2000).

Mode of Transmission

It is most commonly associated with water-droplet transmission from cooling towers. *Legionella* are transmitted directly from the environment to humans with the most common source thought to be aerosolization of water containing *L. pneumophila*.

Risk Groups/Risk Factors

Illness occurs most frequently with increasing age (most cases are at least 50 years of age), especially in persons who smoke and in those:

- with diabetes mellitus;
- with chronic lung disease;
- that require intubation;
- with renal diseases or;
- with malignancy and;
- who are immunocompromised especially solid organ transplant recipients.

The disease is rare in those under 10 years of age; however, nosocomial infection in neonates has been reported. Several outbreaks have occurred among hospitalized patients. Unrecognized infections are common (Alberta Health and Wellness, 2007).

Period of Communicability

Person to person transmission of these bacteria has not been documented.

Specimen Collection and Transport

- Urine for *L. pneumophila* serogroup 1 antigen in a sterile specimen container.
- Bronchoalveolar lavage (BAL).
- Urine and BAL should be refrigerated during transport.
- Blood for serology in a plain tube (red top).



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Methods of Control/Role of Investigator

Prevention and Education

- All devices and equipment that contain, produce, or distribute water or water aerosols must be properly maintained. This may involve draining systems that are not in use, mechanically cleaning systems to remove scale and sediment, and using biocides to limit the growth of *Legionella* (Heymann, 2008).
- Environmental sampling and routine surveillance for this organism is not recommended due to the ubiquitous nature of the organism, the multiplicity of potential sources in the environment, likely recolonization of environmental sources, and the frequency of environmental bacteria in the absence of clinical disease.
- Bacteria can normally be found in the environment with the absence of clinical illness (Alberta Health and Wellness, 2007).

Management

I. Case

History

Source of infection

Inquire about:

- possible exposures to air conditioners, humidifiers, etc., where they work or live;
- presence of other people with similar symptoms to determine if a common source exposure is present.

With the identification of a single laboratory-confirmed case in a health care facility initiate an investigation. This is especially important in facilities serving highly susceptible, immunocompromised patients.

For outbreaks in any other facility, search for:

- common exposures amongst cases;
- common possible environmental source(s) of infection.

Treatment/Supportive Therapy

Cases with Pontiac fever generally recover spontaneously in two to five days without treatment.



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- **Antibiotics:**
Treatment choices are governed by the most recent guidelines. The public health practitioner should direct any questions regarding the current treatment protocols to the physician or Medical Health Officer. See [Appendix H - Sources for Clinical Treatment Guidelines](#).

Heymann (2008, p. 339) indicates the following:

- “The recommended treatment for Legionnaire’s disease is either a respiratory fluoroquinolone, such as levofloxacin, or a newer macrolide (azithromycin). Observational studies suggest that levofloxacin may be more effective than macrolides, especially in severe cases. Rifampicin has been used as an adjunct in patients failing standard therapy, but data to support this approach are lacking. Penicillin, the cephalosporins and the aminoglycosides are ineffective.”

Exclusion

None.

Immunization

Not applicable.

Referrals

Infection control should be notified if the case occurs in a health care facility (acute or long-term).

II. Contacts/Contact Investigation

- Inquire about additional cases in household or school/business setting to determine if a common environmental source exists.
- Quarantine and immunization of contacts are not applicable.

III. Environment

Environmental prevention and control measures (e.g., cleaning, maintenance, decontamination, superheating, superchlorination, etc.) should be referred to the Public Health Inspector Manager/Environmental Health Officer and will likely require engineering expertise.



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Infection Control Measures

Routine/Standard precautions are recommended.

Epidemic Measures

- In epidemic situation, investigation of common exposures and possible environmental sources of infection is required.
- Decontamination of implicated sources may be necessary and expert advice may be required.
- Culturing from environmental sources should only be considered once cases have been confirmed.



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Legionellosis Data Collection Worksheet

Panorama QA complete: ☐ Yes ☐ No

Please complete all sections.

Panorama Client ID: _____

Initials: _____

Panorama Investigation ID: _____

A) CLIENT INFORMATION

LHN -> SUBJECT -> CLIENT DETAILS -> PERSONAL INFORMATION

Last Name:	First Name: and Middle Name:	Alternate Name (Goes by):
DOB: YYYY / MM / DD Age: _____	Health Card Province: _____ Health Card Number (PHN): _____	Preferred Communication Method: (specify - i.e. home phone, text): Email Address: ☐ Work ☐ Personal
Phone #: ☐ Primary Home: ☐ Mobile contact: ☐ Workplace:		
Place of Employment/School:	Gender: ☐ Male ☐ Female ☐ Other ☐ Unknown	
Alternate Contact: _____ Relationship: _____ Alt. Contact phone: _____	Address Type: ☐ No fixed ☐ Postal Address ☐ Primary Home ☐ Temporary ☐ Legal Land Description Mailing (Postal address): Street Address or FN Community (Primary Home): Address at time of infection if not the same:	

B) INVESTIGATION INFORMATION

LHN-> SUBJECT SUMMARY-> ENTERIC ENCOUNTER GROUP ->CREATE INVESTIGATION

Disease Summary Classification:	Date	Classification:	Date	LAB TEST INFORMATION:
CASE		CONTACT		Date specimen collected:
☐ Confirmed	YYYY / MM / DD	☐ Contact	YYYY / MM / DD	YYYY / MM / DD
☐ Does Not Meet Case Definition	YYYY / MM / DD	☐ Not a Contact	YYYY / MM / DD	Specimen type:
☐ Person Under Investigation	YYYY / MM / DD	☐ Person Under Investigation	YYYY / MM / DD	☐ Blood
☐ Probable	YYYY / MM / DD			☐ Urine
				☐ Respiratory Secretions
Disposition: FOLLOW UP: ☐ In progress YYYY / MM / DD ☐ Complete YYYY / MM / DD ☐ Incomplete - Declined YYYY / MM / DD ☐ Not required YYYY / MM / DD ☐ Incomplete - Lost contact YYYY / MM / DD ☐ Referred - Out of province YYYY / MM / DD ☐ Incomplete - Unable to locate YYYY / MM / DD (specify where)				
REPORTING NOTIFICATION		Location:		
Name of Attending Physician or Nurse:				
Physician/Nurse Phone number:		Date Received (Public Health): YYYY / MM / DD		
Type of Reporting Source: ☐ Health Care Facility ☐ Lab Report ☐ Nurse Practitioner ☐ Physician ☐ Other _____				

C) DISEASE EVENT HISTORY

LHN->INVESTIGATION->DISEASE SUMMARY (UPDATE)->DISEASE EVENT HISTORY

Site Description:	☐ Legionnaires' disease	☐ Pontiac fever	☐ Other
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Legionellosis Data Collection Worksheet

Please complete **all** sections

Panorama Client ID: _____
Panorama Investigation ID: _____

D) SIGNS & SYMPTOMS *(Bold text = part of case definition)*

LHN-> INVESTIGATION->SIGNS & SYMPTOMS

Description	No	Yes – Date of onset	Description	No	Yes - Date of onset
Loss of appetite (anorexia)		YYYY / MMM / DD	Headache		YYYY / MMM / DD
Chills		YYYY / MMM / DD	Malaise		YYYY / MMM / DD
Confusion			Myalgia (muscle pain)		
Cough		YYYY / MMM / DD	Pain - abdominal		YYYY / MMM / DD
Diarrhea		YYYY / MMM / DD	Pneumonia		YYYY / MMM / DD
Fever		YYYY / MMM / DD	Respiratory distress		YYYY / MMM / DD

E) INCUBATION AND COMMUNICABILITY

LHN-> INVESTIGATION->INCUBATION & COMMUNICABILITY

Incubation for Case(period for acquisition):	
Earliest Possible Exposure Date: YYYY / MM / DD	Latest Possible Exposure Date: YYYY / MM / DD
<i>Exposure Calculation details:</i>	

F) RISK FACTORS N—No, NA—Not asked, U—Unknown

LHN-> SUBJECT->RISK FACTORS

DESCRIPTION	Yes Start date	N, NA, U	Add'l Info
Chronic Medical Condition - Malignancies/Cancer+			
Immunocompromised - Related to underlying disease or treatment			
Immunocompromised - Transplant Candidate or Recipient - Solid Organ/Tissue+			
Travel - Outside of within Canada (Add'l Info)	YYYY / MM/DD AE		
Travel - Outside of Saskatchewan, but within Canada (add'l info)	YYYY / MM/DD AE		
Water - Aerosol - Air conditioning unit	YYYY / MM/DD		
Water - Aerosol - Other (add'l info)	YYYY / MM/DD		
Water - Aerosol - Room/central humidifier	YYYY / MM/DD		
Water - Aerosol - Shower head	YYYY / MM/DD		

G) TREATMENT

LHN-> INVESTIGATION-> MEDICATIONS->MEDICATIONS SUMMARY

Medication (<i>Panorama = Other Meds</i>) : _____	
Prescribed by: _____	Started on: YYYY / MMM / DD

H) INTERVENTION

LHN-> INVESTIGATION->TREATMENT & INTERVENTIONS->INTERVENTION SUMMARY

Intervention Type and Sub Type:			
Assessment: Investigator name ☐ Assessed for contacts (individuals exposed to same source)		Immunization: Investigator name ☐ Eligible immunizations recommended	
Communication: ☐ Other communication (See Investigator Notes) Investigator name ☐ Letter (See Document Management) Investigator name		Referral: ☐ Infection Prevention and Control Investigator name ☐ Consultation with MHO Investigator name	
General: Investigator name ☐ Disease-Info/Prev-Control ☐ Disease-Info/Prev-Cont/Assess'd for Contacts		Other Investigation Findings: ☐ Investigator Notes ☐ Document Management Notes	
Education/counselling: ☐ Prevention/Control measures ☐ Disease information provided Investigator name			

Legionellosis Data Collection Worksheet

Please complete **all** sections

Panorama Client ID: _____
Panorama Investigation ID: _____

Date	Intervention subtype	Comments	Next follow-up Date	Initials
YYYY / MM / DD			YYYY / MM / DD	
YYYY / MM / DD			YYYY / MM / DD	
YYYY / MM / DD			YYYY / MM / DD	
YYYY / MM / DD			YYYY / MM / DD	
YYYY / MM / DD			YYYY / MM / DD	
YYYY / MM / DD			YYYY / MM / DD	

I) OUTCOMES

LHN-> INVESTIGATION-> OUTCOMES

- | | | |
|---|---|--|
| ☐ Not yet recovered/recovering YYYY / MM / DD | ☐ ICU/intensive medical care YYYY / MM / DD | ☐ Hospitalization YYYY / MM / DD |
| ☐ Recovered YYYY / MM / DD | ☐ Intubation /ventilation YYYY / MM / DD | ☐ Other YYYY / MM / DD |
| ☐ Fatal YYYY / MM / DD | ☐ Unknown _____ | |

Cause of Death: (if Fatal was selected) _____

J) EXPOSURES

Acquisition Event

LHN-> INVESTIGATION-> EXPOSURE SUMMARY-> ACQUISITION QUICK ENTRY

Acquisition Event ID: _____

Exposure Name: _____

Acquisition Start YYYY / MM / DD to Acquisition End: YYYY / MM / DD

Location Name: _____

Setting Type

- ☐ Travel
 ☐ Exposure or consumption of potentially contaminated food or water
 ☐ Most likely source

Initial Report completed by:		Date initial report completed: YYYY / MMM / DD
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