

LEGIONELLOSIS

Disease Overview

Legionellosis is a respiratory disease identified worldwide and is caused by the bacterium *Legionella*. There are several serogroups and *Legionella pneumophila* is the most common. The infection is acquired by inhaling airborne water droplets contaminated with the bacteria. Sporadic cases and outbreaks are documented more commonly in the summer and autumn.

Symptoms

Legionellosis has two distinct clinical manifestations: Legionnaires' disease and Pontiac fever. They are both characterized by headache, fever, myalgia (pain in one or more muscle groups), anorexia (loss of appetite) and malaise. Abdominal pain and diarrhea are common.

Legionnaires' disease is characterized by pneumonia and a nonproductive cough. The illness can be severe progressing to respiratory failure and death.

Pontiac fever is a milder febrile illness, generally accompanied by cough, but does not progress to pneumonia or death. Patients recover spontaneously in 2 to 5 days without treatment.

Reservoir

Legionellosis is a waterborne disease.

The bacteria grow at warm temperatures (e.g. 25 – 45 °C) and the highest risk occurs with water systems that lead to the aerosolization of water stored at these temperatures. This includes hot water systems, wet cooling systems (e.g. air conditioning cooling towers), decorative fountains and whirlpool spas). In addition to warm water temperatures, stagnation, scale, sediment, and biofilms will also contribute to growth of *Legionella*.

Legionella bacteria are also found in natural water sources, such as lakes, ponds and streams, but are generally in levels too low to cause illness. Low levels of the bacteria have also been found in potting soils and compost.

Mode of Transmission

Transmission is via inhalation of aerosols or droplets; however, other modes, such as aspiration of water, are possible. Person to person transmission has not been documented.

Incubation Period

Legionnaires' disease: 2-14 days; most often 5-6 days.

Pontiac Fever: 30-90 hours; most often 24-48 hours.

Period of Communicability

Not applicable

Risk Factors

Increased risk for acquiring/severe illness:

- Travel to commonly affected areas and locally occurring outbreaks
- Immunocompromised persons, chronic disease, including lung or kidney, smoking, alcoholism, and increasing age

- hospitalized patients on respiratory therapy treatment
- Occupational exposure for example: maintenance workers on air conditioning systems

Surveillance Case Definition

Confirmed case

Clinical illness with laboratory confirmation of infection:

- Isolation of *Legionella* 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 *Legionella* species IgG titre between acute and convalescent sera
OR
- IgG titre > 1:128 against *Legionella* species
OR
- Demonstration of *L. pneumophila* antigen in urine (*L. pneumophila* serogroup 1 only)

Probable case

Clinical illness with demonstration of *Legionella* species DNA.

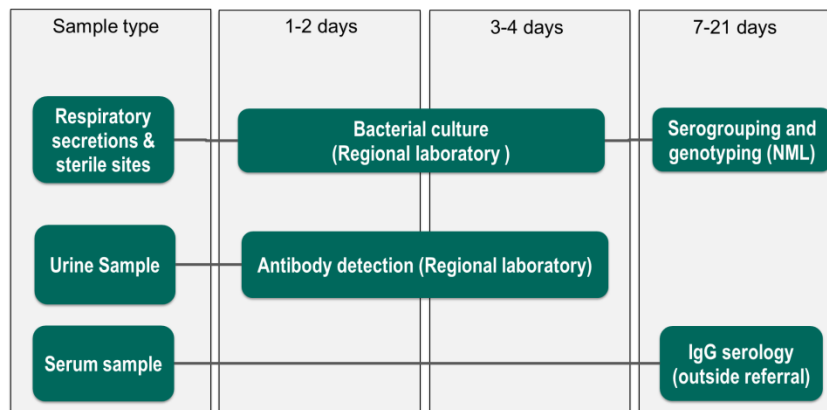
Diagnosis and Laboratory Guidelines

Laboratory Testing

Legionella antibody detection in a urine sample is the most common detection test. Bacterial culture takes longer and needs to be done on either a respiratory secretions specimen or a specimen from a sterile site. Bacterial culture allows for serogrouping and genotyping for epidemiological purposes. IgG serology on a serum sample can be done, but it's not a typical test in New Brunswick and is usually referred.

Urine tests and bacterial culture are offered in regional laboratories in New Brunswick. Urinary antigen assay and culture of respiratory secretions on selective media are the preferred diagnostic tests for Legionnaires' disease.

An overview of testing timelines for samples after the sample has been received by the laboratory. Turnaround times are averages and may change depending on the urgency of the situation.



Reporting

Per Policy 2.2 Disease and Event Notification to OCMOH and Disease and Event Reporting section.

- Enhanced Surveillance. For all confirmed and probable cases an enhanced surveillance form should be completed and information sent to OCMOH within 5 days of completing interview.
- Routine Surveillance (RDSS) for all confirmed cases.

Case Management

Education

The case or relevant caregiver should be informed about:

- Nature of the infection and mode of transmission
- Design, maintenance and monitoring of water systems, including water storage and delivery temperatures.
- Design, maintenance and monitoring of wet cooling water systems, for example drain and clean cooling towers to remove scale and sediment and use a biocide to limit bacterial and biofilm growth.
- Proper maintenance and disinfection of mist producing devices such as shower heads, whirlpool spas, humidifiers and hot tubs.
- Use distilled water in respiratory therapy devices and clean regularly.

Investigation

Obtain risk factor history, including details of residence, work, and recreational activities and potential exposures, and travel history. If a risk factor is identified, consider inspection of the possible source. Two or more cases of legionellosis occurring among travelers to the same destination in a one year period or a single case of laboratory-confirmed institutional-associated Legionnaire's disease should initiate additional case finding measures including an environmental assessment.

Consider environmental swabbing and collection of water samples for *Legionella*:

- Especially from man-made water sources such as humidifiers, whirlpool spas, hot tubs, cooling towers, plumbing systems (water heaters, faucets and showers) and drinking water supplies.
- Look for the presence of biofilm, scale and sediment.

Treatment

Legionnaire's disease: recommended treatment is antibiotics. Pontiac fever is a self-limited illness that does not require antimicrobial treatment.

Immunization

Not applicable

Contact Management

Not applicable as no person to person transmission

Outbreak Management

Activate the local outbreak plan when an outbreak is declared. Identify common exposures and review maintenance logs for water systems that are potential sources of infection. It may be necessary to swab and

culture the water sources to determine if *Legionella* is present. Remediation usually requires biocide disinfection of the implicated water system.