

## PUBLIC HEALTH

## Legionella infection

**Background and epidemiology:** The *Legionella* bacterium was first identified in 1976 when 34 members of the American Legion died at a conference in Philadelphia. It is a ubiquitous aerobic gram-negative organism that lives in soil and water. Although *Legionella pneumophila* is the most common disease-causing species, others such as *L. longbeachiae* and *L. micdadei* also cause disease.

*Legionella pneumophila* infection is most commonly associated with water-droplet transmission from cooling towers for large air-conditioning systems. It has also been found in spas, hot tubs, humidifiers and shower heads. In contrast, *L. longbeachiae* is usually associated with exposures to potting soil. Direct transmission of *Legionella* between people has not been documented.

Clinical symptoms of *Legionella* infection occur 2–10 days after exposure. Infections are more common among people who smoke, are elderly, have existing lung or kidney disease or diabetes, or are otherwise immunocompromised. Case fatality rates range

from 5% to 30%.<sup>1</sup>

Each year, 8000–18 000 people with Legionnaires' disease are admitted to US hospitals. A recent outbreak of Legionnaire's disease in a Toronto nursing home was responsible for 20 deaths among 127 infected residents and workers. Other large outbreaks have occurred; 125 people were infected with *Legionella* from contaminated cooling towers of the Melbourne Aquarium in Australia,<sup>2</sup> and 188 became ill in Netherlands after a flower show where 2 whirlpool spas and a sprinkler later tested positive for *Legionella*.<sup>3</sup>

**Clinical management:** *Legionella* infection (also known as Legionellosis or Legionnaire's disease) usually presents as a severe atypical pneumonia. A rare, mild, self-limiting nonpneumonic illness called Pontiac fever has also been reported.<sup>1</sup>

Patients with Legionnaire's disease usually have high fever, chills and a dry cough. Systemic features, including myalgia, anorexia, headache, diarrhea, confusion, renal impairment and hyponatremia, are also common.

Current recommendations to treat undiagnosed atypical community or institutional acquired pneumonia include antibiotics that are effective against *Le-*

*gionella*, such as erythromycin, ciprofloxacin and rifampicin.

**Diagnosis:** When a patient is suspected to have a *Legionella* infection, the clinician has a choice of possible diagnostic tests, including urinary antigen testing, serology and culture. Polymerase chain reaction (PCR) testing for *Legionella* DNA is also available in some labs.

Urinary antigen testing is the most rapid and sensitive test, but only detects infection with *L. pneumophila*. Samples may not show test-positivity for up to 5 days after the start of symptoms; testing should therefore be repeated if the specimen is taken early in the illness.

Positive serology (immunoglobulins IgM and IgG) for *Legionella* is common in the adult population. To demonstrate recent infection, serology testing requires 2 samples taken 3–6 weeks apart to show a fourfold rise in titre.

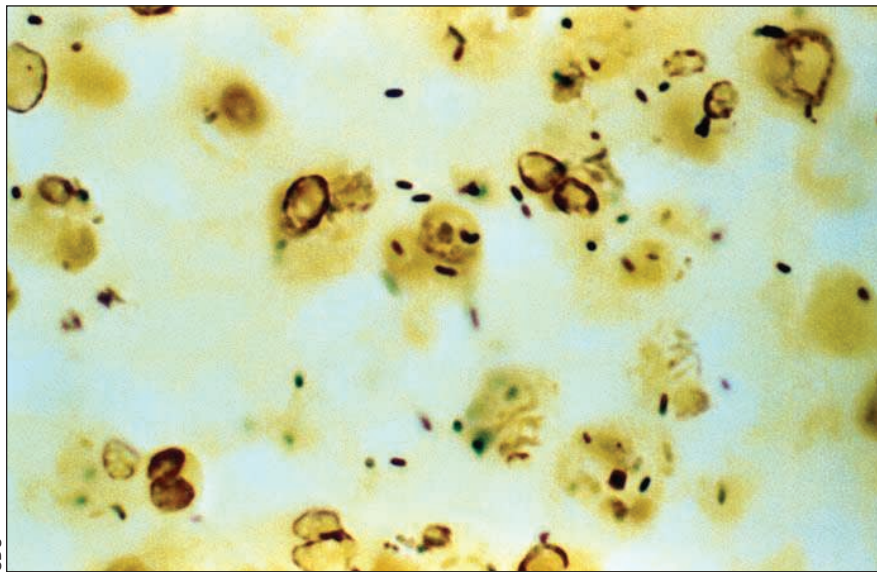
Culturing *Legionella* in vitro is difficult, and conventional media cannot be used; testing for *Legionella* must be specifically requested. Appropriate samples include sputum, pleural fluid or, from deceased patients, lung tissue. Identification of *L. pneumophila* serotypes through sputum culture can be used to trace environmental sources of infection.

**Prevention:** Reducing the risk of *Legionella* infection is possible with good maintenance, disinfection and testing of water-cooling towers. Owners of home humidifiers and spas should follow the manufacturer's instructions for maintenance and disinfection.

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## REFERENCES

1. Centres for Disease Control and Prevention. Legionellosis: Legionnaire's disease and Pontiac fever. Available: [www.cdc.gov/ncidod/dbmd/diseaseinfo/legionellosis\\_g.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/legionellosis_g.htm) (accessed 2005 Oct 14).
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3. Den Boer JW, Yzerman EPF, Schellekens J, et al. A large outbreak of Legionnaires' disease at a flower show, the Netherlands, 1999 [published erratum appears in *Emerg Infect Dis* 2002;8(2):180]. *Emerg Infect Dis* 2002;8:37-43.



Dieterle stain of lung tissue biopsy reveals small, brownish black intra- and extracellular bacilli.