

Legionnaires' Disease: Questions and Answers

Background

Legionnaires' disease is a common name for the pneumonia caused by *Legionella* bacteria. A person can develop Legionnaires' disease by inhaling water mist contaminated with *Legionella*.

Legionella bacteria are naturally found at low levels in lakes, ponds, and streams. With low *Legionella* concentrations in a water source, development of Legionnaires' disease is unlikely. The risk of infection increases as *Legionella* concentrations increase in water sources. Water heaters, cooling towers, and warm, stagnant water can provide conditions that promote *Legionella* growth.

Since the first recognized outbreak of Legionnaires' disease in 1976, scientists have learned much about it and about *Legionella* bacteria. The following questions and answers will help you learn more about what is currently known about Legionnaires' disease.

Symptoms and Exposure

Q. What are the symptoms?

A. Early symptoms are much like the flu. After a short time (in some cases a day or two), more severe pneumonia-like symptoms may appear. Gastrointestinal symptoms, such as diarrhea and nausea, may also be present. In many cases, the pneumonia is severe enough to require hospitalization. In some cases, Legionnaires' disease results in death.

Early flu-like symptoms:

- slight fever;
- headache;
- aching joints and muscles;
- low energy, tired feeling; and
- appetite loss.

Common pneumonia-like symptoms:

- high fever (102° to 105°F, or 39° to 41°C);
- cough (dry at first, later producing phlegm);
- difficulty breathing (dyspnea) or shortness of breath;
- chills; and
- chest pains.

Q. How common is Legionnaires' disease?

A. In the United States, around 6,000 Legionnaires' disease cases are reported each year.

Q. What causes Legionnaires' disease?

A. Legionnaires' disease is caused by infection with the rod-shaped bacteria called *Legionella*. Scientists have identified at least 60 different *Legionella* species, and determined that as many as 20 of these species can cause human disease. *Legionella pneumophila* is the most common species that causes human disease.

Q. How does a person get Legionnaires' disease?

A. A person must be exposed to water contaminated with *Legionella* bacteria to contract an infection that can develop into Legionnaires' disease. This exposure may happen by inhaling or drinking water contaminated with *Legionella* bacteria. For example, inhaling contaminated water mist from a cooling tower, a humidifier, or even a shower or sink can cause the disease.

Q. How soon after exposure can a person develop Legionnaires' disease symptoms?

A. If infection occurs, disease symptoms usually appear within 2-10 days.

Q. Does everyone who inhales *Legionella* bacteria into the lungs develop Legionnaires' disease?

A. No. Most people have resistance to the disease. Scientists believe that fewer than 5 in 100 persons exposed to water contaminated with *Legionella* bacteria will develop Legionnaires' disease.

Q. Are some people at a higher risk to develop Legionnaires' disease?

A. Yes. Some people have lower resistance to disease and are more likely to develop Legionnaires' disease. Factors that can increase the risk of developing the disease include:

- organ transplants (e.g., kidney, heart);
- age (older persons are more likely to get disease);
- heavy smoking;
- weakened immune system (e.g., cancer patients, HIV-infected individuals);
- underlying medical problem (e.g., respiratory disease, diabetes, cancer, renal dialysis);
- certain drug therapies (corticosteroids);
- heavy alcoholic beverage consumption

Q. Is Legionnaires' disease transmitted among people?

A. No. Legionnaires' disease is not contagious and is not transmitted from one person to another.

Monitoring and sampling

- Q. How do we monitor or test for *Legionella* bacteria?
- A. Environmental Health and Safety (EHS) professionals can perform air or water testing. Air testing is not recommended because false negatives are common. Testing water samples from a suspected source is valuable. A qualified microbiological laboratory experienced in *Legionella* testing can determine the *Legionella* concentrations and types in water samples. Review collection, storage, and transportation procedures with the EHS professional before sampling.

Diagnosis and Treatment

- Q. Is Legionnaires' disease easy to diagnose?
- A. No. The pneumonia caused by *Legionella* bacteria is not easy to distinguish from other types of pneumonia. Several diagnostic tests allow physicians to identify Legionnaires' disease. Physicians will obtain a sputum, blood, or urine sample from a patient for these tests.
- Q. How is Legionnaires' disease treated?
- A. Legionnaires' disease is treated with antibiotics. Early treatment reduces the severity and improves chances for recovery. Frequently, hospitalization is necessary because patients develop severe pneumonia with high fevers and severe trouble breathing. Severe pneumonia requires treatment at an acute care hospital.
- Q. If a fellow worker is diagnosed with Legionnaire's disease, what should I do?
- A. Follow guidance from your employer. In general, if you are experiencing or have recently experienced symptoms, your employer should provide you with a confidential interview. If you choose to see your own healthcare provider, please consider signing medical release forms to allow your employer or OSHA to assist in identifying the source.

Exposure Sources

- Q. How did Legionnaires' disease get its name?
- A. Legionnaires' disease got its name from the first outbreak in which the organism was identified as the cause. This outbreak occurred in 1976, in a Philadelphia hotel where the Pennsylvania American Legion was having a convention. Over 200 Legionnaires and visitors at this convention developed pneumonia, and some died. From lung tissue, a newly discovered bacterium was identified as the cause for that pneumonia and was named *Legionella pneumophila*. The respiratory disease is also called Legionellosis.
- Q. Is Legionnaires' disease a new disease?

A. No, Legionnaires' disease is not new, but it was identified only after the 1976 outbreak in Philadelphia. Previously unsolved pneumonia outbreaks that occurred before 1976 are now confirmed as Legionnaires' disease. Scientists continue studying this disease to learn more about it.

Q. Are *Legionella* bacteria widespread in the environment?

A. Yes, studies confirm that these bacteria are found in both natural and man-made water sources. Natural water sources that can contain the organism in low levels include rivers, streams, lakes, and ponds, as well as mud.

Q. Could I get Legionnaires' disease from natural water sources?

A. It is unlikely. In the natural environment, the very low *Legionella* levels in water sources probably cannot cause disease.

Q. What common man-made water sources present the greatest concern?

A. Water mist from cooling towers or evaporative condensers, evaporative coolers (swamp coolers), humidifiers, misters, showers, faucets, whirlpool baths and hot tubs can become contaminated with *Legionella* bacteria. If the contaminated water mist is inhaled or swallowed, it can cause the disease.

Q. What water conditions help cause *Legionella* growth?

A. Warm, stagnant water provides ideal conditions for growth. At temperatures between 68° and 122°F (20° - 50°C), the organism can multiply. Temperatures between 95° and 115°F (35° - 46°C) are ideal for growth. Rust (iron), scale, and other microorganisms can also promote *Legionella* growth.

Q. How do you prevent Legionnaires' disease?

A. Avoiding water conditions that allow *Legionella* bacteria to grow to high levels is the best prevention. Specific preventive measures include:

- Regularly maintaining and cleaning cooling towers and evaporative condensers to prevent *Legionella* growth. This should include twice-yearly cleaning and periodically using chlorine or another effective biocide;
- Maintaining domestic water heaters used in the workplace at 140°F (60°C) and maintaining the water temperature at 122°F (50°C) or higher at the faucet; and
- Avoiding conditions that allow water to stagnate. Frequently flushing unused water lines will help alleviate stagnation. Large water storage tanks exposed to sunlight can produce warm conditions favorable to high *Legionella* levels.

- Q. If a water system is already contaminated with *Legionella* bacteria, or if contamination is suspected, is it possible to clean or decontaminate it?
- A. Special cleaning procedures can eliminate *Legionella* from water sources. In many cases, these procedures involve using chlorine-producing chemicals or high water temperatures. Seek professional assistance before attempting to clean a water system.

Pontiac Fever

- Q. Can *Legionella* bacteria cause other diseases?
- A. Yes. In addition to Legionnaires' disease, the same bacteria also cause a flu-like disease called Pontiac fever.
- Q. How does Pontiac fever differ from Legionnaires' disease?
- A. Unlike Legionnaires' disease, which can become a serious and deadly pneumonia, Pontiac fever produces flu-like symptoms that may include fever, headache, tiredness, appetite loss, muscle and joint pain, chills, nausea, and a dry cough. Full recovery occurs in 2-5 days without antibiotics. Pontiac fever has not resulted in any reported deaths.
- Q. Are there other differences between Legionnaires' disease and Pontiac fever?
- A. Yes. Unlike Legionnaires' disease, which occurs in few people who are exposed, Pontiac fever may produce an infection rate approaching 90%. In addition, the time between exposure to *Legionella* bacteria and disease symptoms (called the incubation period) is generally shorter for Pontiac fever than for Legionnaires' disease. Pontiac fever symptoms can appear within 1-2 days after exposure.