



OSHA TECHNICAL MANUAL (OTM)

[OTM Home](#) | [Section III: Chapter 7](#)

[Safety and Health Topic Page](#) | [Viewing / Printing Instructions](#) | [Credits](#)



# Legionnaires' Disease

[Disease Recognition](#)

[Potential Disease Sources](#)

[Investigation Protocol](#)

[Outbreak Response](#)

[Facts and FAQs](#)

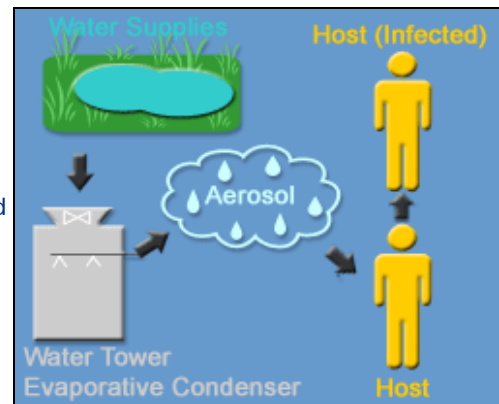
## Section IV: What actions are required when an outbreak has been confirmed?

An outbreak of Legionnaires' disease exists when two or more cases of the disease can be attributed to a building, or some portion of a building, within a six-week period. If at least one of the cases was within the last 30 days, assume that an outbreak is still in progress. An outbreak requires a high-priority investigation and immediately initiating control measures to prevent additional exposures to all water systems that have a reasonable potential for contamination and worker exposure.

### Outbreak Response:

The following actions are used to abate the threat of further infection in a building in which an outbreak of Legionnaires' disease has occurred:

- [Evacuation and isolation: relocate high-risk individuals](#)
- [Inspect facility and collect water samples](#)
- [Conduct a level two investigation](#)
- [Control actions: prevent additional exposure](#)



### Evacuation and isolation: relocate high-risk individuals

[^ TOP](#)

Under most circumstances, evacuation of the building is not recommended. However, with confirmation of an outbreak individuals with compromised health conditions must be removed from the implicated building. Individuals at high risk for contracting the disease include:

- Immuno-suppressed people
- Organ transplant patients
- Chemotherapy patients including those treated with corticosteroids
- Individuals a physician judges to be in poor health

### Inspect facility and collect water samples

[^ TOP](#)

**Inspection:** The building must be inspected to identify all potential Legionnaires' disease bacteria (LDB) sources including:

- Water-cooled, heat-transfer systems

- Domestic water systems
- Humidifiers and misters
- Any sources of water that are maintained above 68°F (20°C) and have a potential for being aerosolized



Fig. 2: Inspect all potential water sources.

**Water Sampling:** Collect appropriate water samples to determine LDB levels before shutting down the water systems.

- These sample results will be invaluable in establishing the cause of the outbreak.
- See [Appendix II:E. Water Sampling Guidelines](#).



Fig. 3: Collect appropriate water samples.

Before flushing or disinfecting the water in suspected sources, take water samples for analysis to determine the predominant serogroups and subtypes of *L. pneumophila* in the water source and to determine the number of colony forming units (CFU) per unit of water.

- This information may be helpful in identifying the source of the disease if the subtype of *L. pneumophila* has been identified in the afflicted workers.
- Because sampling for LDB can be inconclusive, sampling results alone should not determine the appropriate course of action in a building where an outbreak has occurred. **Corrective actions should begin immediately.**
- Water sampling protocols specific to each operating system are described in [Appendix II](#).

[Additional information](#) (App I:A) on serogroups and subtypes is also available.

### Control actions: prevent additional exposure

^ TOP

**Assume that all potential sources of contamination are contaminated and treat them accordingly.**

- This includes hot and cold domestic water, cooling towers, humidifiers, and any other potential sources of water exposure.



Fig. 4: Post warning labels as appropriate.

**Control actions need not require facility shutdown.** Temporary provisions including the following can allow work to continue:

- Supply bottled water for drinking.
- Shutdown water heaters to can eliminate hot-water access.
- Use temporary cooling towers to allow work to continue.

#### Shutdown:

- A member of the building maintenance, engineering staff, or expert outside consultant who has a working knowledge of the system's design and current operation can explain how the water system operates and the proper procedure for a controlled shutdown.

#### Treatment:

- The treatment of potential sources of contamination following inspection and water sampling is described for specific operating systems in [Section II](#).
- After treatment, collect and analyze water samples for CFU of LDB to determine the effectiveness of the treatment. Upon re-use of a water system following treatment, maintenance and water sampling are essential to ensure that maintenance continues to be effective.

[Disease Recognition](#) | [Source and Control](#) | [Water Sampling Guidelines](#) | [Investigation Protocol](#)

[Outbreak Response](#) | [FAQ](#) | [Scope](#)

[OTM Home](#) | [Section III: Chapter 7](#)

[Safety and Health Topic Page](#) | [Viewing / Printing Instructions](#) | [Credits](#)

 [Back to Top](#)

[www.osha.gov](http://www.osha.gov)

[www.dol.gov](http://www.dol.gov)

---

[Contact Us](#) | [Freedom of Information Act](#) | [Customer Survey](#)  
[Privacy and Security Statement](#) | [Disclaimers](#)

---

Occupational Safety & Health Administration  
200 Constitution Avenue, NW  
Washington, DC 20210