Preventing an Outbreak of Legionnaires’ Disease

Gallagher Hospitality Practice
Background

Legionnaires’ disease is a type of lung infection that accounts for approximately 18,000 hospitalizations each year in the United States. The fatality rate of this illness is between five and fifteen percent of those afflicted. The disease was named after the first known outbreak at the Bellevue-Stratford Hotel in Philadelphia, Pennsylvania in 1976, which occurred during a meeting of the American Legionnaires commemorating the 200th anniversary of the signing of the Declaration of Independence. In this first documented outbreak of the illness, 221 American Legionnaires were infected and 34 died as a result of the illness.

What is Legionnaires’ disease and how is it transmitted?

Legionnaires’ disease, a type of pneumonia, is caused by the legionella bacterium. These bacteria are commonly found in natural environments such as lakes, streams, rivers and moist soil. Typically, the levels of the bacteria are low in natural settings and will not cause illness. More commonly, Legionnaires’ disease is contracted from bacteria found in man-made bodies of water and in potable water systems. Common locations for the presence and growth of the legionella bacteria include hotel plumbing systems, air conditioning units (cooling towers) and indoor fountains and hot tubs. Legionnaires’ disease is contracted through inhalation or aspiration of water vapor or mist containing the legionella bacteria, such as droplets formed when flushing a toilet or breathed in during a shower or bath. Legionnaires’ disease is not spread from person to person.

The legionella bacterium can survive in a wide range of conditions, including temperatures between 32 degrees and 145 degrees. The right temperature is critical for proliferation and colonization of legionella, and it is most likely to occur in water temperatures between 104 degrees and 122 degrees. It is important to note that most hotel hot tub temperatures are between 102 and 104 degrees, making a hot tub the perfect environment for the legionella bacteria to flourish, because of its temperature, low water levels and the ease in which the bacteria can be inhaled by bathers.

Once a person is exposed to the bacteria, the incubation period of Legionnaires’ disease is between two and ten days before symptoms of the illness appear. Typically, someone infected with the bacteria may feel tired and weak for several days, and most patients who are admitted to the hospital develop a high fever, often greater than 104°F. Gastrointestinal symptoms such as diarrhea, nausea, vomiting, and stomach discomfort are common. Other symptoms of the infection include headaches, muscle aches, chest pain, and shortness of breath. The lengthy incubation period often makes determining the source of the contagion problematic.

The prognosis for recovery is excellent for patients treated with antibiotics at the onset of the pneumonia. For individuals who are smokers or have compromised immune systems, the delay of treatment can result in prolonged hospitalization, complications and death.
Prevention

Because the legionella bacteria flourish in water systems such as those commonly found in hotels, proper and regular maintenance of the hotel’s water system is the best way to prevent an outbreak of Legionnaires’ disease. Maintenance procedures should include focus on:

- **Temperature.** All water in the system should either be cooled to below 68°F or heated to above 140°F
- **Hygiene.** Water should be kept free of any impurities and never allowed to stagnate. Flush low-use pipes frequently
- **Avoidance.** Don't use materials that harbor bacteria and other micro-organisms, or provide nutrients for microbial growth
- **Maintenance.** Maintain the cleanliness of the system and the water in it. Maintain residual chlorine (>0.1 ppm) at every outlet
- **Use proper water treatment techniques.** If there is no or little (<0.5 ppm) residual chlorine in the water supply as it enters the building, then the presence of Legionella should be presumed
- **Control.** Restrict the release of water spray
- **Install water filters.** Ice machines and drinking water lines should be equipped with water filters. Install cooling towers to minimize direct personal exposure to mists and to prevent entrainment of mists into outdoor air intakes.

The primary objective is to avoid creating an environment in which legionella bacteria will flourish and to avoid producing water in a spray or aerosol form. It may be possible to prevent the risk of exposure by using different equipment; where this is impractical, the risk may be controlled by minimizing the release of droplets and by ensuring water conditions which inhibit the growth of legionella bacteria. This may include engineering controls, cleaning protocols and other control strategies.

Remediation

If Legionella is suspected, or indicated by local authorities, contact a qualified environmental consultant to properly assess the building, review any medical data from the local health authority or Centers for Disease Control and then create a site specific remediation plan. This plan should address the underlying health concerns with the least amount of impact or business interruption to the facility.

For potable water systems, remediation might require the sterilization all shower heads and aerators on the impacted system and flushing the system with water in the 150-160 degree range for a period of time.

Depending upon the specific conditions, the impacted system may also need to be hyper-chlorinated to kill the bacteria and then flushed clean to remove the residual chorine. In both cases, the areas impacted will need to be taken out of service for a minimum of 24 hours.

An outbreak of Legionnaires’ disease can result in business disruptions, negative publicity and liability. The most effective way to prevent these risks is through meticulous and regular maintenance of all water sources in the hotel.
About the author

Jim Stover is a veteran hospitality loss control expert who was formerly the Vice President of Loss Prevention for Bristol Hotels & Resorts. A principal in the Loss Prevention Practice Group, he also manages loss control for Gallagher’s Hospitality Niche.

Contact your Gallagher advisor for additional information and to ensure appropriate measures are in place to prevent an outbreak of Legionnaires’ disease at your property.

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