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Latest Legionnaires Research Findings Suggest Control Procedure Changes

Legionnaires Disease, a form of pneumonia caused by a species of bacteria known as Legionella pneumophila, is a problem that building owners, facility managers and engineering personnel have dealt with as a water treatment issue for 25 years. The first identified outbreak of the disease occurred at an American Legion convention in Philadelphia in 1976. The source of the outbreak was identified at the time as a cooling tower that serviced the air conditioning system in the hotel in which the convention was being held.

From the time of that first outbreak until very recently, the conventional wisdom among microbiologists and members of the medical community was that the sole means of transmission of Legionnaires Disease was through inhalation of an aerosol or mist of water contaminated with Legionella pneumophila. Devices that created water aerosols were considered potential sources, including spas, hot tubs, grocery store vegetable misters, shower heads and, especially, cooling towers.

Water treatment professionals, along with facilities and engineering personnel in office buildings, hotels, hospitals and universities have structured and managed their water treatment programs based on the premise that cooling towers were the primary source and means of transmission of Legionnaires Disease. However, new evidence suggests that another way of contracting Legionella is more likely. Researchers now believe that "aspiration" is the most common way that Legionnaires Disease is transmitted.

Aspiration is the act of choking such that fluid in the mouth gets past the choking reflexes and enters the lung rather than the stomach. This is what is sometimes referred to as "swallowing down the wrong pipe." The protective mechanisms that prevent aspiration are defective in persons who smoke or have lung disease. It now appears that aspiration is more prevalent than inhalation as a means of transmission.

The new research further suggests that exposure to even a very small number of Legionella pneumophila bacteria can result in disease in susceptible persons (smokers, persons with lung disease, the elderly, those with suppressed immune systems and others).

This new information on the mode of transmission of Legionella requires changes in the ways in which building engineers and facilities managers assess and control the risk of an outbreak of Legionnaires Disease. Where they have previously focused almost entirely on the maintenance and treatment of cooling towers and other aerosolizing devices in their Legionella control efforts, they must now look at their water distribution system as presenting the greatest potential for serving as a Legionnaires outbreak source. In particular, domestic hot water storage tanks are prime locations for Legionella colonization.

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Previously, the Cooling Technologies Institute (CTI) and Centers for Disease Control and Prevention (CDC) have promoted a somewhat reactive approach to Legionella control. Both organizations recommended against regular testing for Legionella bacteria, and suggested that the best means of preventing an outbreak of Legionnaires Disease involved keeping cooling tower systems clean and having a good microbiocide program in place. Based on the latest research, many experts now recommend that, in addition to good housekeeping and maintaining a good cooling water treatment chemical program, regular testing for the presence of Legionella pneumophila bacteria may be in order.

Whether to conduct regular Legionella testing, and what and where to test are site specific, experts say. The decision on whether regular testing should be included in a facility's Legionella control plan needs to be made on an assessment of the number and location of potential sources of Legionella growth and transmission, along with the possibility of exposure to those sources by persons susceptible to infection.

If a facility determines that Legionella testing is required, there are a number of laboratories around the country that perform this service. As much as two weeks may be required for laboratory testing to be completed. A new field test is now available that gives results immediately. Decisions on whether to test, what systems to test, how many tests, how often and by what method can be difficult and confusing for facilities and engineering personnel. Legionella experts almost universally agree that building owners and managers should contract with a professional water treatment company for help in assessing, planning and implementing their Legionnaires Disease control programs.