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Preventing Legionnaires' Disease: Frontline Tools for Environmental Health Practitioners

Executive Summary

Environmental health practitioners play a critical role in the prevention, identification, and mitigation of Legionnaires' disease outbreaks (Kunz & Cooley, 2016). Over the last 20 years, Legionnaires' disease outbreaks have increased significantly and the Centers for Disease Control and Prevention (CDC) continues to learn about the disease and how to prevent it (Association of State and Territorial Health Officials, 2019; CDC, 2019). For example, CDC investigations show almost all (9 in 10) Legionnaires' disease outbreaks were caused by problems preventable with more effective building water management. Water management programs have become an important industry standard and are now required in healthcare facilities nationwide (Centers for Medicare & Medicaid Services, 2018; Veterans Health Administration, 2014).

The ASHRAE recently released expanded and updated guidelines (Guideline 12-2020) to help prevent Legionnaires' disease (ASHRAE, 2020). These guidelines support water management programs and significantly expand previous guidance.

The ASHRAE Guideline 12-2020:

- provides design, operation, and control parameters for various devices and systems,

- such as decorative fountains, hot tubs, cooling towers, and potable water systems;
- includes considerations for when testing is appropriate;
- reviews recent and evolving testing methods; and
- suggests response activities according to routine testing results.

Legionella

- CDC created a series of six easy-to-use content modules to summarize the updated guidance. This toolkit aims to help environmental health practitioners, building owners and operators, and facility engineers:
- evaluate hazardous conditions quickly,
 - implement control measures,
 - strengthen water management programs, and
 - support environmental assessments during public health investigations.

The toolkit's six content modules (Figure 1) summarize Guideline 12-2020 updates across common sources of exposure: potable water systems, cooling towers, hot tubs, decorative fountains, and other devices. Each content module includes essential information from Guideline 12-2020 regarding the design, operation, maintenance, and controls specific to the corresponding source of exposure. Module recommendations are anchored to four key factors that affect the ability to grow in water: sediment and biofilm, temperature, water age, and disinfectant residuals. The importance of these four factors is highlighted in a quick-reference table of control measures for each respective device or system

(Table 1). One additional module describes considerations if Legionella testing is conducted for routine purposes, such as water management program validation. The testing module contains practical information such as values for performance indicators and a multifactorial approach to understanding test results.

Updated Legionella Environmental Assessment Form for Building Water Systems From the Centers for Disease Control and Prevention

CDC has also updated the Legionella Environmental Assessment Form (LEAF) based on

field experience during outbreak responses and to better align with Guideline 12-2020. Public health officials can use LEAF to gain a thorough understanding of a facility's water systems and assist facility management with using environmental control measures to minimize the risk of Legionnaires' disease. It can also be used along with epidemiologic information to determine whether to conduct Legionella environmental sampling and to develop a sampling plan.

A key revision to LEAF includes an expanded cooling tower appendix refined over the course of multiple CDC-led field investigations. During an outbreak involving cooling towers, rapid identification and environmental assessment are essential to limit the number of people exposed. The updated LEAF supports CDC procedures developed in 2019 for identifying cooling towers during an outbreak investigation (Figure 2).

By sharing knowledge and developing easy-to-use resources, CDC hopes to empower local communities to prevent outbreaks of Legionnaires' disease. Explore CDC's Legionella resources at www.cdc.gov/legionella/health-depts/environmental-inv-resources.html.

References

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