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Preventing Legionnaires' Disease Through a New Learning Opportunity: A Training on *Legionella* Water Management Programs

Editor's Note: NEHA strives to provide up-to-date and relevant information on environmental health and to build partnerships in the profession. In pursuit of these goals, we feature this column on environmental health services from the Centers for Disease Control and Prevention (CDC) in every issue of the *Journal*.

In these columns, authors from CDC's Water, Food, and Environmental Health Services Branch, as well as guest authors, will share insights and information about environmental health programs, trends, issues, and resources. The conclusions in these columns are those of the author(s) and do not necessarily represent the official position of CDC.

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The Need for Water Management Program Training

The number of reported Legionnaires' disease (LD) cases increased by more than 250% over the past decade, with at least 8,400 cases reported in 2018 (Centers for Disease Control and Prevention, 2018). A recent review of Centers for Disease Control and Prevention (CDC) field investigations indicates that 85% of LD outbreaks were caused by problems that could have been prevented with more effective water management (Garrison et al., 2016). Water management programs (WMPs) can help prevent cases of LD by identifying and addressing conditions that might lead to the growth and spread of *Legionella* bacteria within premise plumbing systems. WMPs can mitigate risk factors such as stagnation of water, inadequate residual disinfection levels, and improper maintenance of aerosolization devices (e.g., decorative fountains). The Centers for Medicare & Medicaid Services now requires healthcare facilities to have WMPs to minimize the risk of *Legionella* and other pathogens in hospi-

tals, skilled nursing facilities, and critical access hospitals.

A proactive approach to water management requires a diverse team with skill sets in engineering and environmental health. In healthcare settings, the team should also include the skill set of infection control. This WMP team must have adequate knowledge of the building's water system, the capacity to identify proper control locations and limits, and the authority to implement appropriate corrective actions when necessary. Additionally, this team should have the ability to reconcile environmental data with clinical surveillance for LD. Effective educational resources and templates can help facility management and operations staff design and carry out a WMP (Lucas, Cooley, Kunz, & Garrison, 2016). In response to CDC's Federal Register Notice (Docket No. CDC-2017-0069) to assess WMP implementation methods, respondents indicated that inadequate awareness, knowledge, or expertise were major barriers to implementation. To address these needs, CDC developed a WMP toolkit (www.cdc.gov/legionella/wmp/toolkit/index.html), a

suite of tools and materials for LD response and prevention (Table 1), and online training.

In December 2018, CDC and partners launched Preventing Legionnaires' Disease: A Training on *Legionella* Water Management Programs (PreventLD Training). The online training was designed for public health professionals, building managers, maintenance and engineering staff, safety officers, equipment and water treatment suppliers, infection control specialists, and other professionals involved in WMP design and implementation. CDC worked in partnership with the National Network of Public Health Institutes, the University of Arizona Mel and Enid Zuckerman College of Public Health, and the Western Region Training Center at the University of Arizona to create the PreventLD Training. A team of LD subject matter experts from federal agencies, industry, and health departments reviewed and provided consultation at every stage of the training development. The training meets CDC quality training standards, including a training needs assessment, accurate and relevant content, and learner engagement opportunities.

TABLE 1

Centers for Disease Control and Prevention Legionnaires' Disease Resources

Resource and Description	Website
Fact sheets for distribution to employees, guests, or the public	www.cdc.gov/legionella/resources/materials.html
Steps involved in a full outbreak investigation <ul style="list-style-type: none"> • Considerations for travel-associated and community outbreaks • Patient interview and hypothesis generation tools • Line list templates 	www.cdc.gov/legionella/health-depts/epi-resources/outbreak-investigations.html
Environmental investigation and sampling resources <ul style="list-style-type: none"> • Environmental assessment form • Sampling procedures and potential sampling sites protocol • Environmental investigation videos • Procedures for identifying cooling towers • Things to consider when hiring consultants 	www.cdc.gov/legionella/health-depts/environmental-inv-resources.html
Laboratory resources <ul style="list-style-type: none"> • Environmental <i>Legionella</i> Isolation Techniques Evaluation (ELITE) program • Laboratory response plan toolkit • Processing environmental samples guidance • Specimen submission form 	www.cdc.gov/legionella/labs/index.html
Healthcare investigation resources <ul style="list-style-type: none"> • Defining healthcare-associated disease • Unique healthcare investigation factors and guidance 	www.cdc.gov/legionella/health-depts/healthcare-resources/index.html
Communication resources <ul style="list-style-type: none"> • Example notification letters for hotel guests, healthcare patients, and staff • Sample press releases and health advisories • Other communication considerations 	www.cdc.gov/legionella/health-depts/communications-resources.html
Water management program guidance <ul style="list-style-type: none"> • Key elements of water management programs • Guidance for monitoring building water systems • Water management program data collection template • Special considerations for healthcare facilities • Public hot tub operator guidance 	www.cdc.gov/legionella/wmp/index.html

TABLE 2

Preventing Legionnaires' Disease: A Training on *Legionella* Water Management Programs (PreventLD Training) Sections and Corresponding ASHRAE 188 Standard Steps

Section	ASHRAE 188 Standard Step
Module A: Getting Started—Introduction to <i>Legionella</i>	Step 1: Create a water management program team
Module B: Hazard Analysis	Step 2: Describe the building water systems using text and flow diagrams Step 3: Identify areas where <i>Legionella</i> could grow and spread
Module C: Hazard Control	Step 4: Decide where control measures should be applied and how to monitor them Step 5: Establish ways to intervene when control limits are not met
Module D: Confirmation	Step 6: Make sure the program is running as designed and is effective (verification and validation) Step 7: Document and communicate all the activities of your water management program
Additional resources	Healthcare facility case study Manufacturing facility case study Templates

PreventLD Training Highlights

PreventLD Training is a free, dynamic, online training made up of modules that follow the seven steps of creating a *Legionella* WMP consistent with the industry standard (i.e., ASHRAE Standard 188) for minimizing the risk of LD (Table 2). Pilot testers took an average of a half hour to complete each module and an average of 3 hours to complete the entire training. The training provides tools to manage water systems in hospitals, retirement homes and long-term care facilities, hotels, high-rise apartment complexes, and other buildings. This training also addresses other devices that might need a WMP such as cooling towers, decorative fountains, hot tubs, and water misters. Through interactive course content and templates (Figures 1 and 2), users create an action plan for developing a practical WMP and team. Course participants also have the opportunity to apply

the learning concepts in two case study scenarios: a skilled nursing facility and a manufacturing facility. These case studies provide concrete examples of potential challenges and solutions faced when creating and implementing a WMP.

Diverse organizations working with hospitals, hotels, and state and local organizations have promoted the PreventLD Training. As of July 2019, over 1,600 participants have registered for the training. Most training participants have been environmental health staff, followed by professionals from infection control and prevention, engineering and maintenance, and nursing homes. Wide use of this training should lead to more effective WMPs and a reduced risk of patient, visitor, guest, and staff exposure to *Legionella* bacteria. Take advantage of PreventLD Training by enrolling today or sharing with colleagues. Learn more at www.cdc.gov/nceh/ehs/learn/prevent-LD-training.html. 🐼

FIGURE 1

Key Skills of a Water Management Program Team



FIGURE 2

Preventing Legionnaires' Disease: A Training on *Legionella* Water Management Programs (PreventLD Training) Hazard Control Table Template

Water Processing Step	Potential Hazards (Microbial, Chemical, Physical)	Risk Characterization (Significant Y/N)	Basis for Risk Characterization	Hazard Control Options (at This Location)	Is Control at This Location Essential? (Y/N)
1. Receiving					
2. Cold Water Distribution					
3. Heating					
4. Hot Water Distribution					
5. Wastewater					

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