FACILITY OPERATIONS / MAINTENANCE AND OPERATIONS

Legionella: An 'everyone' issue

By Phillip Maloy / Special to Healthcare Facilities Today
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Multiple industry associations and recognized industry experts are increasing the pressure for facility owners and managers to further reduce the risk of hospital-acquired illnesses, particularly when it comes to minimizing the risk of waterborne pathogens, such as Legionella bacteria.

The first industry recognized "standard" may be just over the horizon. Compliance with the new standard may be more manageable than you think, and could prevent thousands of new cases of Legionellosis (i.e. Legionnaires' disease) yearly in the U.S. Equally important, it may also offer the best defense against an accusation of negligence in legal cases.

With the intention to better control the disease, The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) has proposed a new Standard 188P, Prevention of Legionellosis Associated with Building Water Systems. Under the new standard, facility owners and managers will be required to formally take responsibility for controlling Legionella in their building water systems. This includes the domestic water system in buildings, in addition to cooling towers, fountains, spas and the list goes on.

The need for an industry recognized standard has become more apparent as cases of Legionnaires' disease continue to rise in the U.S. In fact, there has been a 217 percent increase from 2000-2009 in annually reported cases in the U.S. according to the Center for Disease Control (CDC). In the first half of this decade, officially reported incidence rates have tripled. According to the CDC, an estimated 8,000-18,000 people are hospitalized with Legionnaires' disease each year in the U.S.

One factor behind the increase in reported cases of Legionnaires' disease is medical professionals previously misdiagnosed Legionella as "community-acquired" pneumonia, a common and treatable lung infection. Whereas Legionnaires' disease is very uncommon, it presents a life-threatening form of pneumonia with a fatality rate of 5 to 30 percent, according to the CDC. Improper treatment as a result of misdiagnosis can cause lasting complications or death. While many hospital administrators prefer not to talk about the "L" word, understanding the bacteria and how to prevent it is the first step towards mitigating risk and keeping patients' safe.

Understanding Legionella

First and foremost, it is important for health administrators to realize that if a hospital has tested positive, it does not always mean there is a Legionella problem; where and how often water systems test positive determines if a problem exists. In fact, it is a misconception among hospitals that they are doing something wrong if they have Legionella bacteria in their water. Every water system and pipe is prone to becoming a home to Legionella. The complex network of pipe surfaces, common with hospital water systems, creates an ideal condition for Legionella to thrive. When bacteria such as Pseudomonas sp enters a water system, within 15 minutes it can form a monolayer of biofilm, creating an ideal habitat for Legionella bacteria to take residency. Any disturbances to the water system can disrupt the biofilm, releasing the Legionella bacteria into the potable water. While the bacteria thrive in warm water, it typically enters water systems through the cold water

main. The good news is that Legionella bacteria can be controlled affordably and effectively in hospitals, minimizing risk and improving patient outcomes. The best method for hospitals to combat the disease is to take proper action to test for Legionella with a plan in place to treat their water system should a problem arise.

Treating Legionella in your water system

With no vaccine to protect against Legionellosis, keeping Legionella bacteria out of the water is key to preventing infection. This can be achieved through maintenance and treatment of the hospital's water systems. There are several options available for treating water systems. Heat and flush, and high chlorination treatments being the most well-known. Unfortunately, the results are short term with both approaches, and they can be expensive due to higher maintenance and energy costs, as well as increase system corrosion rates. Long-term solutions which have a proven track record include chlorine dioxide and monochloramines. The following discussion of each treatment option is intended to provide insight in determining the proper approach for a facility.

Heat and flush — The heat and flush method, also known as thermal treatment, has historically been a common method used to treat Legionella bacteria as it is a quick, short-term solution. The treatment method involves heating the tap water in a hospital to at least 140 degrees for one hour, and then flushing all the water through showerheads and faucets. During this process, the water is undrinkable and scalding is a risk for staff and patients. This method can be implemented quickly, as it does not require any special equipment but it is labor-intensive and expensive, requiring many people to monitor and flush hot water sites and system holding tanks. This method is ineffective for a long-term solution as it only treats the hot water, leaving the entire cold water system including ice machines (a known habitat of Legionella bacteria) untreated.

Chlorination — This method involves adding one to two parts per million (ppm) free residual chlorine in the hospital water system, treating both the hot and cold water. In order for chlorination to be effective and safe, however, the hospital needs to find a balance of just enough chlorine to kill the Legionella but not too much so that the water is undrinkable or a risk to human health. Like the heat and flush method, chlorination is a quick and easy short-term solution, but it has little effect on the biofilm, making it an ineffective long-term solution. While chlorination is fairly inexpensive, over time, it is corrosive and damaging to the piping.

Chlorine dioxide or monochloramine — The most effective of the treatment methods and the only long-term solution for combating Legionella bacteria requires using a safe and effective chemical approach based on either chlorine dioxide or monochloramine. While no method is guaranteed, and these treatments may take time to reach optimal performance, both chemistries are effective at killing bacteria in bulk water including the troublesome biofilm, even at low chemical levels. Effective suppression also requires following appropriate operational procedures (e.g., regular flushing of systems). Chlorine dioxide is typically added to the cold water main, and might need additional hot water treatment, whereas monochloramine is effective in treating both the hot and cold water systems. Although these methods require the purchase of specialized equipment, the cost is only moderately more expensive if selected, installed and maintained properly, than the alternative treatment programs mentioned above. Once in place, this treatment method provides hospitals with a long-term solution requiring minimal maintenance. Thanks to state-of-the-art technology built into control systems as well as mobile monitoring, these methods also enable real-time monitoring 24 hours a day with results being archived for up to 5 years, helping hospitals further reduce risk.

Despite the effectiveness of chlorine dioxide or monochloramine to reduce waterborne pathogens, it is important to find water treatment experts who are able to partner with hospitals to monitor water systems and educate staff. The good news is that the proposed ASHRAE Standard 188P will be tough on water treatment providers who cut corners, helping hospital administrators in identifying a reliable partner. For competent water treatment providers, the Standard will reinforce that they are taking the necessary efforts that the standard practice requires. A competent water treatment specialist will partner with hospitals to help with training, detection, prevention and monitoring. In addition, they can help select reliable equipment that can withstand constant use and will proactively monitor the system to ensure proper flow rates, as well as routinely maintain the system to prevent failure and minimize mishaps.

Any water treatment system to suppress Legionella, should be part of a complete Legionella program. Medical facilities should engage in proper water treatment and other activities to minimize risk and appropriately respond to any outbreaks.

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Identifying Legionella issues starts with setting a baseline through culturing

LEGIONNAIRES' DISEASE CAN BE PREVENTED AND TREATED — but it starts with identifying the problem. The best way to identify and monitor for Legionella is to culture the water. It is also the method for ensuring effective long-term treatment.

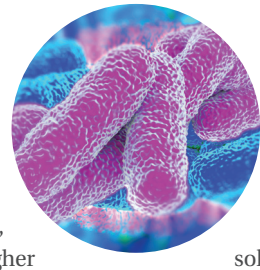
Culturing is the process of collecting water samples and testing them for the genus species Legionella pneumophila. To be effective, hospital staff needs to collect a representative amount of samples from the cooling towers and potable water systems. In a 200 bed hospital, for example, it is recommended that samples be taken from 10 to 12 hospital rooms and units on various floors. Not all rooms should be treated equally – neonatal, transplant and intensive care units pose higher risks than waiting rooms or janitorial areas.

Results from culturing can often be confusing, making hospital administrators hesitant to engage in this process. One common issue is that culturing may produce multiple negative results, before producing a positive reading. When retesting after a positive culture, it is not uncommon to receive another negative reading, prompting hospital administrators to question whether the investment of their time and resources is worthwhile. A second reason hospitals are hesitant to culture is due to not having a plan in place to respond if Legionella is present in their facility. In fact, in the past the CDC has recommended that hospitals only culture if they see one or two cases of Legionellosis that appear or if the hospital has a transplant center. A positive result does not always mean a problem, and once hospital administrators are aware of what the results mean, it helps demystify the process and highlight how culturing can be a tool for prevention.

What do my culture readings mean?

- Less than 30 percent – When samples show less than 30 percent presence of L. pheumophila and if no high-risk areas come back positive, it is suggested by industry experts* that hospitals culture again every six to eight months. If two to three cultures are performed and there is no sign of L. pheumophila for a year, hospitals can move to testing once per year.
- More than 30 percent – According to industry experts, there is a reason to be concerned if more than 30 percent of the samples come back with L. pheumophila present or if a high-risk area tests positive according to industry experts*. When this occurs, it is recommended that hospital culture again immediately to determine if treatment is needed or if they should continue monitoring.

* Special Pathogens Laboratory; et.al.



Culturing provides hospitals a proactive approach to treating Legionella, as well as being one of the most effective long-term indicators for ensuring treatments are being properly implemented. It is important that we break down the confusion behind it and make it part of the solution for this problem.

Legionellosis by the numbers

- 217 percent – the increase in annually reported U.S. Legionellosis cases from 2000-2009. Officially reported incidence rate has tripled in this decade. Source: CDC
- $34,000 – the number of direct healthcare dollars it costs in the U.S. to treat a single case of Legionellosis. Source: CDC
- $539 million annually – the cost to the healthcare system for hospitalizations for three common waterborne diseases with Legionnaires' disease being the largest cost. Source: CDC
- $193 million – the largest dollar jury award (so far) for gross negligence and other failures in a case of Legionellosis that resulted in long-term disability and severe debilitation. The case was not fatal. Source: Claims Management
- $255,000 - $5.2 million – range of reported settlements and jury awards. Reports of settlements are rare as most agreements include stipulations that payout amounts remain confidential. The serious personal injury or death caused by this disease makes proof of extensive compensatory damages simple. Source: Claims Management
- 8,000-18,000 – the estimated number of people hospitalized with Legionnaires' disease each year in the U.S. Source: American Society for Microbiology

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