

CMS mandates water management programs in healthcare facilities



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BACKGROUND

A study conducted by Tufts University School of Medicine found that more than 617,000 hospitalizations from 1991 to 2006 were related to three common opportunistic waterborne pathogens: *Legionella pneumophila*, *Mycobacterium avium*, and *Pseudomonas aeruginosa*.¹

These hospitalizations resulted in costs of about \$9 billion in Medicare payments—an average of \$600 million a year. The costs may now exceed \$2 billion for 80,000 cases per year.¹

Between 2000 to 2014, there was a four-fold increase in the number of cases of Legionnaires' disease.² According to the Centers for Disease Control and Prevention (CDC), 85 percent of all Legionnaires' disease outbreaks were attributed to water system exposures that could have been prevented by effective water management programs (WMP).³ Therefore, it is essential that healthcare facilities establish WMPs to ensure water safety for patients.

LEGIONELLA AND OTHER WATERBORNE PATHOGENS

Legionnaires' disease is a severe pneumonia caused by *Legionella*, a waterborne bacterium. *Legionella* species are gram-negative bacilli, measuring 2 to 20µm, found naturally in freshwater environments.⁴

Legionella is of concern when it grows and spreads in water systems, such as showers, faucets, cooling towers, decorative fountains, and hot tubs that are not drained after each use. It can flourish in complex building water systems that are not well maintained.

The following conditions promote *Legionella* growth^{3,5}:

- Low level of disinfectant: Inadequate disinfection cannot kill or inactivate *Legionella* species.
- Stagnation: Allows biofilm growth, reducing the effectiveness of disinfection and providing protection from heat.
- Biofilm: Provides food and shelter to waterborne organisms.

- Sediment: Promotes growth of water commensal microflora.
- Algae, flavobacteria, and *Pseudomonas* can supply nutrients for *Legionella* growth.
- Temperature between 20 and 50°C (68–122°F) (optimal growth temperature range is 35–46°C [95–115°F]).
- pH between 5.0 and 8.5.

Those most susceptible to the disease are people age 50 or over; those with a history of smoking, chronic disease, immunosuppression, or cancer; or people with underlying illnesses such as diabetes, kidney failure, or liver failure. While about 10 percent of cases are fatal, mortality associated with healthcare-associated Legionnaires' disease is reported to be as high as 46 percent.³

Besides *Legionella* species, there are many opportunistic waterborne pathogens, such as *Pseudomonas*, *Acinetobacter*, *Burkholderia*, *Stenotrophomonas*, nontuberculous mycobacteria, and fungi.⁶ Effective WMPs not only reduce the risk of *Legionella* growth, but also prevent growth of other waterborne pathogens.

CMS REGULATORY AUTHORITIES

On June 2, 2017, the Centers for Medicare & Medicaid Services (CMS) released a policy memorandum (Ref: S&C 17-30-Hospitals/CAHs/NHs) mandating WMPs in all healthcare facilities to reduce *Legionella* risk.⁶

This memorandum is addressed to hospitals, critical access hospitals, and long-term care facilities. However, all healthcare organizations need be aware of the issue.

Healthcare facilities are expected to:

- Conduct a facility-wide water safety risk assessment.
- Implement a WMP based on the ASHRAE standard 188 and CDC kit.⁷⁻⁸
- Define and specify testing protocols, acceptable ranges for control measures, and document specific actions that will be taken when control limits are not met.

The optimal goal is to mitigate the risk of growth and spread of *Legionella* and other opportunistic waterborne pathogens in healthcare facility water systems. Healthcare facilities are expected to comply with these requirements to protect their patients. Facilities failing to demonstrate measures to minimize the risk of Legionnaires' disease risk citation for noncompliance with the CMS Conditions of Participation.

WHAT HEALTHCARE FACILITY LEADERS NEED TO KNOW

This CMS regulatory memorandum (Figure 1) is mandatory. Healthcare facility leadership needs to know that this memorandum is pertinent to the (previously published) 42 CFR §482.42 for hospitals⁶:

The hospital must provide a sanitary environment to avoid sources and transmission of infections and communicable diseases. There must be an active program for the prevention, control, and investigation of infections and communicable diseases.

Noncompliance may carry severe consequences (e.g., losing CMS reimbursement or a CMS citation).

In response, healthcare facilities should create WMPs and ensure that the following elements of water management are implemented⁷⁻⁸:

1. Establish a water management program team to comply with ASHRAE standard 188 and CDC kit.
2. Describe building water systems using text and flow diagrams.

Figure 1.

DEPARTMENT OF HEALTH & HUMAN SERVICES
Centers for Medicare & Medicaid Services
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Center for Clinical Standards and Quality/Survey & Certification Group

Ref: S&C 17-30-*Hospitals/CAHs/NHs*
REVISED 06.09.2017

DATE: June 02, 2017

TO: State Survey Agency Directors

FROM: Director
Survey and Certification Group

SUBJECT: Requirement to Reduce *Legionella* Risk in Healthcare Facility Water Systems to Prevent Cases and Outbreaks of Legionnaires' Disease (LD)
****Revised to Clarify Provider Types Affected****

Memorandum Summary

- **Legionella Infections:** The bacterium *Legionella* can cause a serious type of pneumonia called LD in persons at risk. Those at risk include persons who are at least 50 years old, smokers, or those with underlying medical conditions such as chronic lung disease or immunosuppression. Outbreaks have been linked to poorly maintained water systems in buildings with large or complex water systems including hospitals and long-term care facilities. Transmission can occur via aerosols from devices such as showerheads, cooling towers, hot tubs, and decorative fountains.
- **Facility Requirements to Prevent Legionella Infections:** Facilities must develop and adhere to policies and procedures that inhibit microbial growth in building water systems that reduce the risk of growth and spread of *legionella* and other opportunistic pathogens in water.
- *This policy memorandum applies to Hospitals, Critical Access Hospitals (CAHs) and Long-Term Care (LTC). However, this policy memorandum is also intended to provide general awareness for all healthcare organizations.*

Background

LD, a severe sometimes fatal pneumonia, can occur in persons who inhale aerosolized droplets of water contaminated with the bacterium *Legionella*. In a recent review of LD outbreaks in the United States occurring in 2000–2014, 19% of outbreaks were associated with long-term care facilities and 15% with hospitals. The rate of reported cases of legionellosis, which comprises both LD and Pontiac fever (a milder, self-limited, influenza-like illness) has increased 286% in the US during 2000–2014, with approximately 5,000 cases reported to the Centers for Disease Control and Prevention (CDC) in 2014. Approximately 9% of reported legionellosis cases are fatal.

3. Identify at-risk populations.
 4. Identify areas, equipment, and systems at risk where *Legionella* could grow and spread.
 5. Assign responsibility to implement risk mitigating strategies.
 6. Establish actions to monitor the strategy parameters.
 7. Decide where control measures should be applied and how to monitor them.
 8. Establish interventions when control limits are not met.
 9. Communicate throughout the facility.
 10. Document all the activities.
 11. Ensure the program is running as designed and is effective by reviewing the program periodically.
 12. Keep accurate records.
- Water disinfection falls mainly under each facility's department of maintenance and engineering as these staff members have knowledge of the plumbing system design and current operation. They know water treatment and proper procedures for a controlled shutdown and water disruption.⁷⁻⁹

The Joint Commission Leadership Standard (LD.01.03.01) states, “*The governing body is ultimately accountable for the safety and quality of care, treatment, and services.*” Healthcare executives must provide leadership support and financial support to ensure that WMPs are established and operate effectively.

WHAT IPS NEED TO KNOW

IPs play a critical role in WMP teams. IPs are the subject matter experts in waterborne pathogen transmission routes, infection prevention protocol, and methods of preventing infection. IPs know where high-risk patient populations are located, including inpatient and outpatient care areas. IPs can identify clinical support areas and components and devices that can expose patients to contaminated water. Therefore, IPs are essential members of water management committees.⁷⁻⁸

The CDC toolkit for reducing *Legionella* growth has guides and includes a specific section for healthcare facilities.⁸ The toolkit can steer IPs in their practice. IPs should collaborate with the other departments to implement the following actions in the WMP.

1. Conduct risk assessment for waterborne pathogens.
2. Identify location of reservoirs (wet sites) and disseminators.¹⁰
Some examples:
 - a. Humidifiers, ventilators, CPAP machines, hydrotherapy equipment, sinks, hot tubs (saunas), fountains, aerators, faucet flow restrictors, ice machines.
 - b. Wet mops, wet sponges, wet washcloths.
3. Assess likelihood of aerosol exposure and likelihood of bacterial growth.
4. Identify high-risk patient population units and locations.
5. Evaluate the necessity of installing point-of-use water filtration to protect highly susceptible populations.
6. Establish proactive action plans to be taken to eliminate risk.
7. Perform surveillance for waterborne disease among patients.
8. If a case is identified, notify the state department of public health and healthcare providers, so clinicians can test patients with healthcare-associated pneumonia for Legionnaires’ disease with both a culture of respiratory secretions and the *Legionella* urinary antigen test.
9. Conduct investigations.
10. Prepare contingency plans in the event of water restriction.
11. Communicate throughout the facility and document the activities.

Healthcare-associated waterborne illnesses present a significant risk to patients. An effective comprehensive water management program can have a positive impact on patients and quality of care.¹¹

WHAT’S COMING NEXT?

On August 18, 2017, the CDC announced the opening of a docket to obtain public comments on effective methods for achieving implementation and how WMPs can be improved.¹² The information will be used to guide best practices in preventing Legionnaires’ disease and disease due to other waterborne pathogens. The CDC will update its guidelines and recommendations to reflect the information gathered. It is of paramount importance that IPs stay alert for updates on WMPs

from the CDC and their state public health authorities. **P**

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Water Management Program Implementation at a New Children’s Hospital: Using a Process to Prevent Waterborne Pathogen Disease. Rupp A, Cain MF, Cochran M, *American Journal of Infection Control*, Vol. 43, Issue 6, S53.

Evaluation of a New Point-of-use Faucet Filter for Preventing *Legionella* and Total Bacterial Exposure. Baron J, Peters T, Shafer R, et al., *American Journal of Infection Control*, Vol. 42, Issue 6, S146.

Collateral Damage in the Battle Against *Legionella*: Effects of Chlorine Dioxide on a Dialysis Unit Water System. Sisler L, Gotses J, Smith R, *American Journal of Infection Control*, Vol. 45, Issue 6, S36–S37.