Preventing Waterborne Infections in the Healthcare Environment:

Implementing a Water Management Plan and Complying with the CMS Mandate

David Krause, PhD, MSPH, CIH
Certified Industrial Hygienist / Toxicologist
Co-Author of 2015 AIHA Legionella Guideline

APIC Metro Area Chicago
Two-Day Education Event
10/25/2018
WHAT IS LEGIONNAIRES' DISEASE?
Legionnaires’ Disease

• Develops 2-10/14 days after exposure to legionella bacteria with an avg. of 5-6 days

• Symptoms (extrapulmonary) include:
  – Headache, muscle pain, chills
  – Fever that may be 104°F (40°C) or higher
  – Cough, mucus and sometimes blood
  – Shortness of breath, chest pain
  – Gastrointestinal symptoms, such as nausea, vomiting and diarrhea
  – Confusion or other mental changes
  – Cardiovascular collapse and death
Pontiac Fever (PF)

• Milder form of Legionellosis
• Flu-like symptoms, including:
  – Fever
  – Chills
  – Headache
  – Muscle aches
• Does not infect lungs
• Usually clears within 2-5 days
• No treatment necessary
**Legionnaires’ Disease Is On the Rise 2000–2015**

*Source: Centers for Disease Control*

*National Notifiable Diseases Surveillance System*
CDC: June 2016-2017

- 450% Increase reported cases since 2000
- Fatalities in 10% to 25% of persons infected
- Examined 23 outbreaks
- 11 of 23 (49%) in healthcare facilities
Effective Date: Immediately. This guidance should be communicated with all survey and certification staff, their managers and the State/Regional Office training coordinators within 30 days of this memorandum.

DEPARTMENT OF HEALTH & HUMAN SERVICES
Centers for Medicare & Medicaid Services
7500 Security Boulevard, Mail Stop C2-21-16
Baltimore, Maryland  21244-1850

Center for Clinical Standards and Quality/Quality, Safety and Oversight Group

DATE: June 02, 2017

TO: State Survey Agency Directors

FROM: Director
Quality, Safety and Oversight Group (formerly Survey & 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 Expectations for Providers, Accrediting Organizations, and Surveyors***
Who is Impacted?

“This policy applies to…”

- Hospitals
- Critical Access Hospitals
- Long Term Care

...intended as general awareness for ALL healthcare organizations
What must be done?
Background & History
First Known Outbreak

- Summer of 1976
- Bellevue Stratford hotel
- American Legion Convention
- ~4,000 attendees
- 221 cases
- 34 deaths
Epidemics prior to 1976

• **1957, Austin, Minnesota: SPAM City**
  – 78 cases of pneumonia between June and August

• **1965, Washington D.C.: St. Elizabeth’s Hospital**
  – 81 patients developed pneumonia (July-August)
  – 14 deaths

• **1974, Philadelphia, PA: Bellevue Stratford Hotel**
  – Independent Order of Odd Fellows convention
  – ~1,500 attendees
  – 20 cases, 2 deaths
Fast forward to 2015 - NYC

• December 2014/January 2015
  – 12 confirmed cases in the Bronx
  – 8 cases among Co-op City residents

• April/May 2015
  – 13 confirmed cases in Flushing-Clearview section of Queens
  – No common source identified

• July 2015
  – 133 confirmed cases and 16 deaths in the South Bronx

• September 2015
  – 15 confirmed cases in Morris Park East Bronx, 1 death
CMS Requirements
CMS–Water Management Program

1. Establish a **Water Management Team**
2. Perform a **Water System Survey** and Prepare Diagrams of building water systems
3. Conduct a **Facility Risk Assessment** to identify areas where *Legionella* and other waterborne pathogens could grow and spread in the facility water systems
4. Establish acceptable ranges for control measures and operations
CMS—Water Management

5. Implement a water management program that considers ASHRAE industry standard and the CDC tool kit, and includes control measures

6. Perform Verification and Validation

7. Keep records of measurements and corrective actions

8. Periodic review and update

This is a continuous improvement model for the life of the building
Elements of a Water Management Program

Developing and maintaining a water management program is a multi-step, continuous process. The key steps, listed here, are explained in more detail throughout the toolkit with the associated step number appearing on the page where the specific step is discussed.

1. Establish a water management program team
2. Describe the building water systems using text and flow diagrams
3. Identify areas where Legionella could grow and spread
4. Decide where control measures should be applied and how to monitor them
5. Establish ways to intervene when control limits are not met
6. Make sure the program is running as designed and is effective
7. Document and communicate all the activities

Continuous program review (see below)
Recommended Next Steps for Compliance
1. BUILD YOUR TEAM
2. COMMIT TO PROCESS
3. MEET REGULARLY

Organize and Convene a Water Management Team (WMT)

Survey and diagram Each Building’s Water Systems

If NO, then document findings and reasons no program is needed

Determine if any water systems pose a Legionella Hazard

If YES, then Perform a Facility Legionella Risk Assessment
Organize a Water Management Team (WMT) → Perform a Building Water System Survey → Determine if water systems pose a Legionella Hazard

- If NO, then document findings and reasons no program is needed
- If YES, then Perform a Facility Risk Assessment

The WMT prepares/updates a Water Management Program based upon Risk Assessment

Verify and Document Program Activities → Implement Corrective Actions if Control Measures Vary from Control Limits → Implement a Program to Monitor Control Measures → Characterize and Assess Current Water Systems and Control Measures

- Validate Program Efficacy
- Identify Building Renovations and Changes in Operations
- Determine potential impacts to water systems

Test Sources for Legionella → Interpret Results → Determine potential impacts to water systems
Key Points

• Multidisciplinary Water Management Team
• Seek the assistance of Competent *Legionella* Professional(s)
• Documentation
  – Risk Assessment
  – Control Measures
  – Acceptable Limits
  – Corrective Actions/Contingency Planning
  – Standard Operating Procedures
• Verification & Testing (Validation)
• Revision, Continuous Improvement
Multidisciplinary Team

- Plumbing systems design
- Facilities operations
- Treatment & control
- Validation/Testing
- Response action
- Infection Prevention
- Leadership/Management
Challenges

• Lack of Expertise on the WMT
• Difficulty in Assessing Risk
  – Understanding how the systems work
  – Where low use fixtures are located
• Demanding Stakeholders
  – “I want/don’t want sampling”
  – “Let’s just replace all the showerheads”
• Available Resources
  – Who is going to do this, who’s going to pay for it
• Incompatible components and chemistry
Myths

• Legionella Sampling is/is not necessary
• Treatment Vendors can provide a Turn-Key Service
  – Expertise
  – Conflict of Interest
• Treating the water will solve/prevent *Legionella* Risk
  – Disinfectant Byproducts
  – Corrosion/Leaks
• Any Detectable *Legionella* = Risk of Disease
• Negative Sample Results = No Risk of Disease
Sources of Legionella Amplification or Exposure

• Cooling Towers
Sources of Legionella Amplification or Exposure

- Cooling Towers
- Potable (Municipal) Water Systems
- Water Heaters
Sources of Legionella Amplification or Exposure

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- Hot Tubs or Spas
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• **Mist Generating Sources**
  – Produce Misters and humidifiers (not steam)
Sources of Legionella Amplification or Exposure

- Cooling Towers
- Potable (Municipal) Water Systems
- Water Heaters
- Hot Tubs or Spas
- Decorative Water Features
- Mist Generating Sources
  - Produce Misters and Humidifiers (not steam)
- Other...
  - Hose Bibs
  - Construction Equipment
  - Pressure Washers
  - Etc.
What is a *Legionella* Source Risk Assessment?

- Not defined in ASHRAE 188
- Not defined in CDC Toolkit
- Is defined in AIHA Guidance on the Recognition, Evaluation, and Control of *Legionella* in Building Water Systems
- Routine vs. Investigative

“The primary goal of a *Legionella* risk assessment is to identify potential amplification sites and transmission sources...in order to minimize exposure risks”
Sources of *Legionella* Amplification

Avoiding exposure to *Legionella* amplification sources through effective source identification and control holds the most promise to prevent outbreaks and sporadic cases of *Legionnaires’* disease.
“Legionella is found naturally in freshwater environments, like lakes and streams, but generally the low amounts in freshwater do not lead to disease. *Legionella* can become a health problem in building water systems. To pose a health risk, *Legionella* first has to **grow** (increase in numbers). Then it has to be **aerosolized** so people can breathe in small, contaminated water droplets.”
Industrial Hygiene Approach to *Legionella* Prevention

Industrial Hygiene is defined as “that science/art devoted to the anticipation, recognition, evaluation, and control of those environmental factors or stresses arising in or from the workplace, which may cause sickness, impaired health and well-being, or significant discomfort among workers or among citizens of the community.”
Industrial Hygiene Approach to *Legionella* Prevention

The American Industrial Hygiene Association recommends that *Legionella* amplification sites, reservoirs, and sources of exposure be proactively identified using validated reliable laboratory methods to measure viable *Legionella* bacteria concentrations.

Secondary water measurements used as indicators of conditions that can allow *Legionella* amplification should not be relied upon to validate control measure effectiveness.
Industrial Hygiene Approach to Monitoring Control Measures for *Legionella*

- Validation of control measures for *Legionella* and other waterborne pathogens is only one part of a “three-legged stool”

- Unintended consequences of water treatment by chemicals and heat

- Accelerated degradation of system components due to water treatment or conservation measures
Question & Answer Session
Thank You!

Forensic Analytical Consulting Services, Inc.

Right People.
Right Perspective.
Right Now.