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RISK MANAGEMENT SERVICES

LEGIONELLA TOOLKIT

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LEGIONELLA TOOLKIT
TABLE OF CONTENTS

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WATER MANAGEMENT
Policy & Procedure

POLICY:
It is the policy of the facility to have a plan to reduce the risk of growth and spread of opportunistic pathogens including Legionnaires' in the building water systems.

Fundamental Information

Legionnaires' disease is a severe form of pneumonia that often requires hospitalization and is fatal in about 10% of cases overall, and in 25% of healthcare associated cases. Legionnaires' disease is caused by the Legionella bacteria. There are at least 60 different species of Legionella, and most are considered capable of causing disease. (http\\cdc.gov/legionella)

TRANSMISSION:

While Legionella is found in natural, freshwater environments, it can become a health concerns in human-made water systems (e.g. plumbing system of large buildings, cooling towers, certain medical devices) where conditions allow it to multiply and come in contact with vulnerable persons. People contract Legionella by inhaling aerosolized water droplets containing the bacteria or, less commonly, by aspiration of contaminated drinking water. (http\\cdc.gov/legionella). Transmission can over via:

- Shower heads
- Cooling towers
- Plumbing Systems
- Certain Medical Devices
- Decorative Foundations

Risk Factors:

- Age $\geq$ 50
- Smoking (current or historical)
- Chronic Lung disease, such as emphysema or COPD
- Immune system disorders due to disease or medication
- Systemic malignancy
- Underlying illness, such as diabetes, renal failure or hepatic failure

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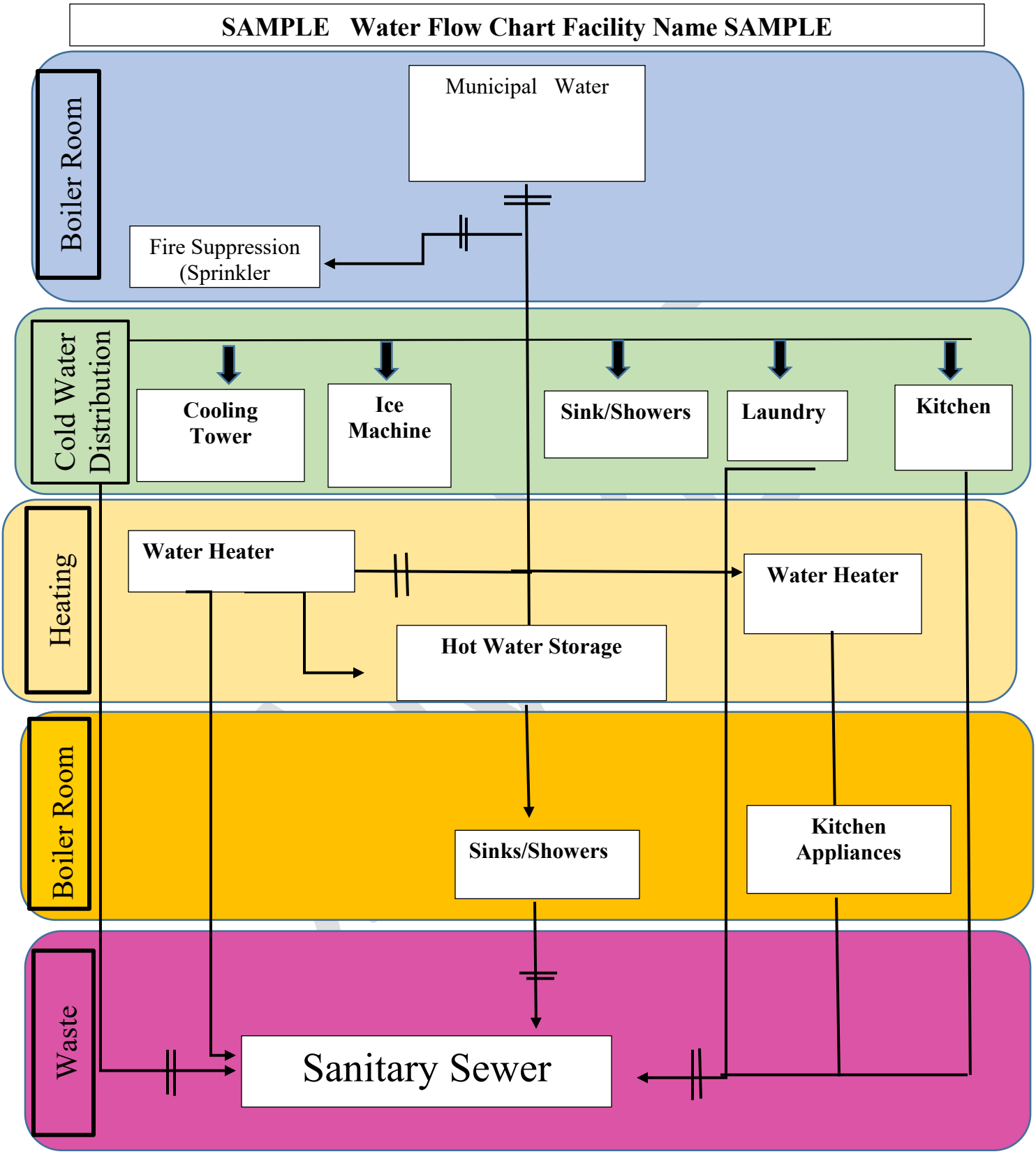
WATER MANAGEMENT
Policy & Procedure

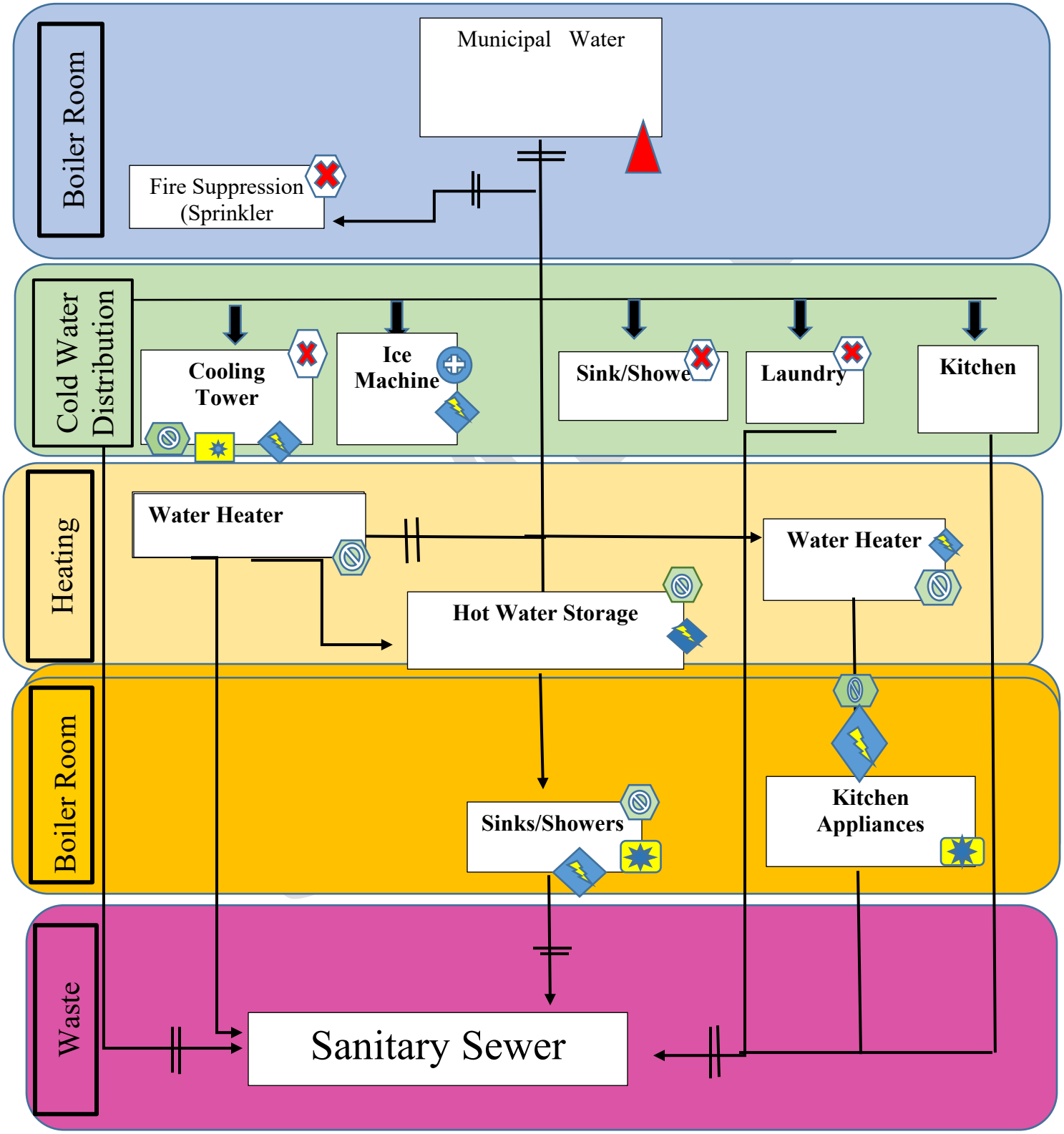
PROCEDURE

Complete the CDC "Worksheet to Identify Buildings at Increased Risk for *Legionella* Growth and Spread" to identify need for a water management program.

- Create the water management team
- Identify and document the building description, including location, age, uses, and occupants and visitors including the water system description (general summary, uses of water, aerosol-generating devices (e.g., hot tubs, decorative fountains, cooling towers), and process flow diagram).
- Identify vulnerable areas in the system and create a diagram to visually pinpoint areas for monitoring and control.
- Identify control measures, including points in the system where critical limits can be monitored and where control can be applied.
- Confirm procedures are in place, including verification steps to show that the program is being followed as written and validation to show that the program is effective
- Document collection and transport methods and which lab will perform the testing if environmental testing is conducted
- Maintain water heater temperatures per the Federal guidelines and document.
- Prevention measures include:
  - Check shower heads for dripping water and rust. Keep shower heads clean, change as needed and document
  - Clean ice machine according to facility ice machine cleaning schedule, ensure the machine is free of excessive standing water and document.
  - Use sterile water for respiratory equipment and change tubing according to facility policy.
  - In the event of an outbreak follow the Emergency Water Plan Policy located in the Emergency Preparedness Manual.
- If a break in the water integrity system occurs, contact:
  1. County Emergency Management:
  2. Local Health Officer:
- Notify anyone who could be affected by the growth and spread of Legionnaires' Disease.



Areas Where Legionella Could spread Flow Diagram Facility Name SAMPLE



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THE CLINICAL COMPONENTS OF A WATER MANAGEMENT PROGRAM

According to the CDC, while most of our residents will recover from Legionnaires disease, 1 out of every 10 people who get sick will die due to complications of the illness. Health departments reported nearly 10,000 cases of Legionnaires disease in the US in 2018 (may be higher due to underdiagnosed Legionnaire's disease)
The key to preventing Legionnaires disease is to reduce the risk of growth and spread through a robust Water Management Program, with implementation of controls to prevent the growth, identify and mitigate water borne pathogens.

When do you test for Legionnaires?

Indicators for Legionnaires Disease Testing include:

- Residents who have failed antibiotic treatment for community acquired pneumonia
- Residents with an overnight stay in a healthcare facility within 14 days of pneumonia symptom onset
- Residents with an epidemiologic link to a confirmed Legionella source or at least 1 laboratory confirmed case of Legionnaires disease

There are 2 Preferred Diagnostic Tests

- A sputum culture from the lower respiratory tract, and/or
- Urinary antigen test, (which is the most commonly used confirmatory test).

The treatment for Legionnaires Disease is with Antibiotic therapy.

The principles of an effective water management include:

- Maintaining water temperatures outside the ideal range for Legionella growth (77–113-degree F)
- Maintaining premise plumbing, equipment, and fixtures to prevent sediment, scale, corrosion, and biofilm, that provide a habitat and nutrients for Legionella.

At a minimum., your facility's water management program team should consist of:

- Administrator,
- Building Maintenance Director/Environmental Services Director,
- Director of Nursing, and
- Infection Preventionist Nurse

The F-tag clinically associated with Legionnaires Disease is **F880- Infection Prevention and Control**. On 7/6/2018 CMS issued a **revised QSO-17-30** for skilled nursing facilities requiring that ***"the facility must establish and maintain an infection prevention and control program designed to provide a safe, sanitary, and comfortable environment and to help prevent the department and transmission of communicable diseases and infections."***

CDC defines a Legionnaires Disease and Pontiac Fever outbreak when 2 or more people are exposed to Legionella in the same place and get sick at about the same time.

Next steps to implement when identifying that an outbreak has occurred:

- Notify the local health department (if they have not already notified you)
- Create a facility binder to maintain documentation as there will be a lot of collaboration and documentation from both internal and external correspondence throughout the investigation.
- Expect a visit from an Epidemiologist and team to conduct an investigation.
- Conduct an audit of all residents with a diagnosis of pneumonia within the last 6 months. You may or may not have to test them for Legionella Disease.
- Expect a Legionella Risk Assessment to be conducted at your facility often completed by outside water management/ Legionella experts.

Example of a Sample Test Results:

Environmental Culture Test-Legionella			
Location	**Result**	**Concentration**	**Species**
LoH-2. Rm 109 Lav Sink Swab	Positive	1000.0 CFU/swab	L. pneumophila, serogroup 1
LoH-10. 300 Spa Shower #1 Hose/Shower Head Swab	Not Detected		
LoH-12. 300 Spa Shower #2 Hose/Shower Head Swab	Not Detected		
LoH-25. 200 Spa Shower #2 Hose/Shower Head Swab	Positive	180.0 CFU/swab	L. pneumophila, serogroup 1
LoH-27. HWH Serving the 100	Positive	35.0 CFU/mL	L. pneumophila, serogroup 1
LoH-28. HWH Serving the 300	Positive	>1500.0 CFU/mL	L. pneumophila, serogroup 1
LoH-32. 200 HWH	Positive	>1500.0 CFU/mL	L. pneumophila, serogroup 1
LoH-33. 400 HWH	Positive	385.0 CFU/mL	L. pneumophila, serogroup 1
Environmental Culture Test-Legionella (1L)			
Location	**Result**	**Concentration**	**Species**
LoH-1. Room 101 Lav Sink Hot 1st Draw	Positive	>1500.00 CFU/mL	L. pneumophila, serogroup 1
LoH-3. Rm 109 Lav Sink Hot 1st Draw	Positive	>1500.00 CFU/mL	L. pneumophila, serogroup 1
LoH-4. Rm 109 Lav Sink Cold Post Flush	Positive	5.00 CFU/mL	L. pneumophila, serogroup 1
LoH-5. Rm 111 Lav Sink Hot Post Flush	Positive	315.00 CFU/mL	L. pneumophila, serogroup 1
LoH-6. Beauty Shop Hair Sink Hot 1st Draw	Positive	835.00 CFU/mL	L. pneumophila, serogroup 1
LoH-7. Rm 116 Lav Sink Hot Post Flush	Positive	15.00 CFU/mL	L. pneumophila, serogroup 1
LoH-8. Rm 125 Lav Sink Hot 1st Draw	Positive	1.60 CFU/mL	L. pneumophila, serogroup 1
LoH-9. Rm 306 Lav Sink Cold Post Flush	Not Detected		

It is crucial to detect additional cases of healthcare associated Legionnaires Disease with an ongoing water testing process to include:

- Assessing the efficacy of implemented measures in reducing or eliminating Legionella spp. By collecting specimens for culture at 2-week intervals for 3 months.
- If Legionella spp. is not detected in cultures during 3 months of monitoring at 2-week intervals, collect cultures monthly for another 3 months.

- Conduct active clinical surveillance to identify residents with healthcare-associated pneumonia with onset of 48 hours post-admission and perform Legionella specific testing for affected residents.

Once initiated, active clinical surveillance should continue for at least 2 months, as described in the Healthcare Infection Control Practices Advisory Committee (HIPAC) guidance. Many public health jurisdictions will recommend active clinical surveillance for up to 6 months or longer, depending upon factors such as identification of additional cases or concerns regarding performance of the water management program.

CDC and ASHRAE standards for facility testing controls include:

- **Test and log the hot water temperatures.**
  - Recommended weekly
- **Flush to remove impurities, test pressure relief valve on boilers**
  - Recommended monthly
- **Inspect eyewash stations.**
  - Recommended monthly
- **Decorative Fountains**
  - Recommended monthly
- **Flush Low Flow Fixtures.**
  - Recommended monthly
- **Faucet Aerators and Shower Wands.**
  - Recommended every other month
- **Legionella Water Management Plan Review - Upload your plan to TELS**
  - Recommended every 12 months and as needed due to construction or failure/breakdown of water system
- **Testing for Chlorine and PH levels**
  - Recommended monthly

There are free and available continuing education credits available online from the National Environmental Health Association (NEHA). https://www.cdc.gov/nceh/ehs/elearn/prevent-LD-training.html
CDC Water Management Plan Template : https://www.cdc.gov/legionella/downloads/toolkit.pdf
NADONA Water Management Plan: How does this affect Clinical? https://www.nadona.org

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HEALTHCARE WATER MANAGEMENT PROGRAM FAQS – CDC LEGIONNAIRES' DISEASE AND OTHER INFECTIONS ASSOCIATED WITH BUILDING WATER SYSTEMS

1. **Why are healthcare facilities at higher risk for having Legionnaires' disease cases and outbreaks than other types of buildings?**
   Healthcare facilities, such as hospitals and nursing homes, usually serve the populations at highest risk for Legionnaires' disease. These include older people and those who have certain risk factors, such as being a current or former smoker, having a chronic disease, or having a weakened immune system. Also, healthcare facilities can have large complex water systems that promote Legionella (the bacterium that causes Legionnaires' disease) growth if not properly maintained. For these reasons, the Centers for Medicare and Medicaid Services (CMS) and the Centers for Disease control and Prevention (CDC) consider it essential that hospitals and nursing homes have a water management program that is effective in limiting legionella and other opportunistic pathogens of premise plumbing (waterborne pathogens) from growing and spreading in their facility.

2. **What are "opportunistic pathogens of premise plumbing" and what are some examples other than Legionella?**
   Opportunistic pathogens of premise plumbing are germs that grow well in drinking water distribution systems and can cause disease in humans. Examples of these include *Pseudomonas, Acinetobacter, Burkholderia, Stenotraphomonas*, nontuberculous mycobacteria, various species of fungi, and *Naegleria fowleri*. Many of the environmental factors that are conducive for *Legionella* growth also allow for growth of these other opportunistic pathogens.

3. **How do *Legionella* and other opportunistic pathogens of premise plumbing get into building water systems?**
   Legionella and other waterborne pathogens occur naturally in the environment, in bodies of water like lakes, rivers, and streams. Although municipalities treat their water with disinfectants like chlorine that can kill these pathogens, a number of factors may allow these pathogens to enter a building's water distribution system, such as:
   - Construction (including renovations and installation of new equipment): Vibrations and changes in water pressure can dislodge biofilm and release *Legionella* or other waterborne pathogens. Biofilm is a slimy layer in pipes in which pathogens can live; it can give pathogens a safe harbor from disinfectants.
   - Water main breaks: Changes in water pressure can dislodge biofilm and release *Legionella* or other waterborne pathogens. In addition, water main breaks can introduce dirt and other materials into the water that use up all the available disinfectant.
   - Changes in municipal water quality: Changes in water quality can increase sediment, lower disinfectant levels, increase turbidity, or cause pH to be outside recommended

ranges. Also, if a supplier changes the type of disinfectant it uses, this change can impact how the water management program team should monitor its building water systems.

In addition, factors within building water systems can promote *Legionella* growth, including:

- Biofilm, scale, and sediment
- Fluctuations in water temperature and pH
- Inadequate levels of disinfectant
- Changes in water pressure
- Water stagnation

Water Management Sampling

4. What is a water management program?

Water management programs identify hazardous conditions and take steps to minimize the growth and spread of *Legionella* and other waterborne pathogens in building water systems. Developing and maintaining a water management program is a multi-step process that requires continuous review. Seven key activities are routinely performed in a *Legionella* water management program:

a. Establish a water management program team;
b. Describe the building water systems using flow diagrams and a written description;
c. Identify areas where *Legionella* could grow and spread;
d. Decide where control measures should be applied and how to monitor them;
e. Establish ways to intervene when control limits are not met;
f. Make sure the program is running as designed (verification) and is effective (validation);
g. Document and communicate all the activities.

In general, the principles of effective water management include:

a. Maintaining water temperatures outside the ideal range for *Legionella* growth (77-113 degrees F);
b. Preventing water stagnation;
c. Ensuring adequate disinfection;
d. Maintaining premise plumbing, equipment, and fixtures to prevent sediment, scale, corrosion, and biofilm, all of which provide a habitat and nutrients for *Legionella*.

Members of a building water management program team work together to:

a. Identify ways to minimize growth and spread of Legionella and other waterborne pathogens;
b. Conduct routine checks of control measures to monitor areas at risk;
c. Take corrective action if a problem is found.

It is important for Healthcare Facilities to include descriptions of water sources relevant to:

- Patient care areas
- Clinical support areas
- Components and devices that can expose patients to contaminated water

You should also develop an ongoing dialogue with your drinking water provider so that you are aware of any changes that may affect your building's water supply.
Once established, water management programs require regular monitoring of key areas for potentially hazardous conditions. Programs should include predetermined responses to correct hazardous conditions if the team detects them.

5. **Is routine sampling for *Legionella* recommended to validate a water management program at a healthcare facility?**
   Sometimes. The water management program team should regularly monitor water quality parameters, such as disinfectant and temperature levels. By monitoring these parameters, the team can ensure that building water systems are operating in a way to minimize hazardous conditions that could encourage *Legionella* and other waterborne pathogens to grow. However, it is up to the team to determine how to validate the efficacy of the program, based on the environmental assessment and data supporting the overall performance of the water management program. According to the **CDC/Healthcare Infection Control Practices Advisory Committee (HICPAC)** Guidelines for Environmental Infection Control in Health-Care Facilities [241 pages, 2.31 MB] and Guidelines for Preventing Health-care-associated Pneumonia [179 pages], as well as to ANSI/ASHRAE Standard 188–2018, one option for validating the efficacy of the program is to perform environmental sampling for the hazard, in this case *Legionella*. Sampling for Legionella may be an appropriate way to confirm that a water management program, when implemented as designed, effectively controls the hazardous conditions throughout the building water systems that lead to Legionella growth. Additional guidance for Legionella prevention for facilities with protective environments (i.e., transplant units) is included in the HICPAC guidelines. If the team decides to perform validation using environmental sampling for *Legionella* or other waterborne pathogens, it should not be performed in isolation but rather as part of a comprehensive water management program. Specific decisions about sampling frequency, location, and methodology are made by the team. Sampling plans are unique to each facility and are based on factors such as:
   a. Findings from the environmental assessment* and any baseline *Legionella* test results;
   b. Overall performance of the water management program, trend analysis of *Legionella* test results, and water quality parameters (i.e., disinfectant, temperature);
   c. In healthcare facilities, correlation of environmental test results with clinical surveillance data;
   d. Building characteristics (i.e., size, age, complexity, populations served);
   e. Sites of possible exposure to aerosolized water;
   f. Available resources and supplies to support testing.

   *The environmental assessment enables the water management program team to gain a thorough understanding of a facility's water systems and assists facility management with minimizing the risk of legionellosis. Guidance is available via CDC's *Legionella* Environmental Assessment Form

6. **What specific information is available regarding monitoring parameters and control measures (i.e., temperatures, disinfectant levels)?**
   Guidance on monitoring is available, but the specifics for each building will be defined by the water management program team, taking state and local regulations into consideration,

as well as a variety of factors including the facility environmental assessment, manufacturer's operating instructions, and the data supporting the overall performance of the water management program. ASHRAE Guideline 12 may be most helpful.

7. **Can you provide an example of a water management program?**
   The CDC toolkit Developing a Water Management Program to Reduce *Legionella* Growth & Spread in Buildings walks through the key elements of a comprehensive water management program and describes the steps involved in creating and maintaining the program. Every building is different (depending on factors such as the structure, age, location, occupants of the building, or surrounding conditions), so each one needs a tailored program. The details will be defined by the water management program team,taking state and location regulations into consideration. The Preventing Legionnaires' Disease Training created by CDC and partners outlines how to reduce the risk of Legionella in facilities. This online training leads participants through the steps for developing and implementing a water management program. Learn more about implementing a water management program.

Legionella: Healthcare Water Management Program FAQs | CDC
Buildings at Risk for Legionella | CDC
Legionella Toolkit-Version 1.1-June 24, 2021 (cdc.gov)
Legionella Growth and Spread: For Healthcare Facilities | CDC
QSO17-30-18 (cms.gov)
Legionella: Water Management Program Fact Sheet | CDC
Training Menu (cms.gov)
Transmission of Legionnaires' Disease through Toilet Flushing - Volume 26, Number 7—July 2020 - Emerging Infectious Diseases journal - CDC
CDC Legionella Environmental Assessment Form (cdc.gov)
Healthcare Facility Water Management Program Checklist- CDC 11/17/2021 (cdc.gov)

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LEGIONELLA FACTS
(LEGIONNAIRES' DISEASE AND PONTIAC FEVER) CAUSES, HOW IT SPREADS, AND PEOPLE AT INCREASED RISK

Causes and Common Sources of Infection

Legionella bacteria are found naturally in freshwater environments, like lakes, and streams. The bacteria can become a health concern when they grow and spread in human-made building water systems like:

- Showerheads and sink faucets
- Cooling towers (structures that contain water and a fan as part of a centralized air-cooling system for buildings or industrial processes)
- Hot tubs
- Decorative fountains and water features
- Hot water tanks and heaters
- Large, complex plumbing systems
- Water filters
- Humidifiers
- Infrequently used equipment such as eyewash stations
- Ice machines
- Medical devices such as CPAP machines, hydrotherapy equipment, and bronchoscopes

Home and car air conditioning units do not use water to cool the air, so they are not a risk for *Legionella* growth. However, Legionella can grow in the windshield wiper fluid tank of a vehicle (such as a car, truck, van, school bus, or taxi). Particularly if the tank is filled with water and not genuine windshield cleaner fluid.

How it Spreads

After *Legionella* grows and multiplies in a building water system, water containing *Legionella* can spread in droplets small enough for people to breathe in. People can get Legionnaires' disease or Pontiac fever when they breathe in small droplets of water in the air that contain the bacteria.

Less commonly, people can get sick by aspiration of drinking water containing *Legionella*. This happens when water accidentally goes into the lungs while drinking. People at increased risk of aspiration include those with swallowing difficulties.

In general, people do not spread Legionnaires' disease and Pontiac fever to other people. However, this may be possible under rare circumstances.

On average 8,000-18,000 people are hospitalized annually with more common cases found in the summer and early fall.

Talk to your doctor or local health department if:

- You believed you were exposed to Legionella
  AND
- You develop symptoms, such as fever, cough, chills, or muscle aches

Your local health department can determine whether to investigate. Be sure to mention if you spent any nights away from home in the last 14 days.

People at Increased Risk

Most healthy people exposed to *Legionella* do not get sick. People at increased risk of getting sick are:

- People 50 years old or older
- Current or former smokers
- People with chronic lung disease (like chronic obstructive pulmonary disease or emphysema)
- People with weak immune systems or who take drugs that weaken the immune system (like after a transplant operation or chemotherapy)
- People with cancer
- People with underlying illnesses such as diabetes, kidney failure, or liver failure.

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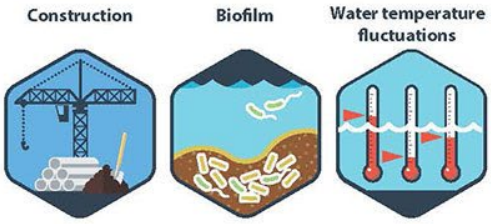
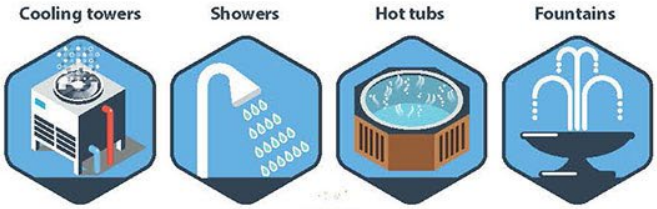
How *Legionella* affects building water systems and people

1. Internal and external factors can lead to *Legionella* growth in building water systems.

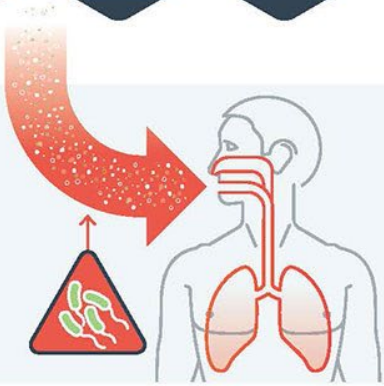


2. *Legionella* grows best in large, complex water systems that are not adequately maintained.

3. Water containing *Legionella* is aerosolized through devices.



4. People can get sick when they breathe in small droplets of water or accidently swallow water containing *Legionella* into the lungs. Those at increased risk are adults 50 years or older, current or former smokers, and people with a weakened immune system or chronic disease.



www.cdc.gov/legionella

03/30/21

This policy and procedure is not intended to replace the informed judgment of individual physicians, nurses or other clinicians nor is it intended as a statement of prevailing community standards or minimum standards of practice. It is a suggested method and technique for achieving optimal health care, not a minimum standard below which residents necessarily would be placed at risk.

Released 6/14/2024

People with Legionnaires' disease have a serious type of pneumonia (lung infection), which can be confirmed by chest x-ray. Doctors typically use two preferred types of tests to see if a patient's pneumonia is caused by *Legionella*.

- Urine test
- Laboratory test that involves taking a sample of sputum (phlegm) or washing from the lung

Treatment and Complications

Legionnaires' disease requires treatment with antibiotics and most cases of this illness can be treated successfully. Healthy people usually get better after being sick with Legionnaires' disease, but they often need care in the hospital.

Possible complications of Legionnaires disease include.

- Lung failure
- Death

About 1 out of every 10 people who get sick with Legionnaires' disease will die due to complications from their illness. For those who get Legionnaires' disease during a stay in a healthcare facility, about 1 of every 4 will die.

Pontiac Fever

Diagnosis

Doctors can use a urine or blood test to see if someone has Pontiac fever. However, a negative test doesn't rule out that someone may have it (this is called a false negative). Doctors most often diagnose Pontiac fever when there are other known cases of *Legionella* infection that lab tests confirmed. These patients with confirmed Legionnaires' disease or Pontiac fever may have been exposed to *Legionella* at the same time or place as other patients with a suspected illness.

Treatment and Complications

Pontic fever goes away without requiring treatment.

Prevention

There are no vaccines that can prevent Legionnaires' disease.

Instead, the key to preventing Legionnaires' disease is to reduce the risk of *Legionella* growth and spread.

Water Management Programs

Building owners and managers can use a water management program to reduce the risk of *Legionella* growing and spreading.

Building water systems and devices that might grow and spread *Legionella* include:

- Showerheads and sink faucets
- Cooling towers (structures that contain water and a fan as part of a centralized air cooling system for buildings or industrial processes)
- Hot tubs
- Decorative fountains and water features
- Hot water tanks and heaters
- Large, complex plumbing systems

Legionella grows best in warm water, like the water temperatures used in hot tubs. Warm temperatures also make it hard to keep disinfectants, such as chlorine, at the levels needed to kill germs like *Legionella*. The levels of disinfectants and other chemicals in hot tubs should be checked regularly and hot tubs should be cleaned as recommended by the manufacturer.

Learn how you can test the water before you use a hot tub and questions you should ask your hot tub operator to determine whether a hot tub has been properly maintained:

- Facts About *Legionella* and Hot Tubs
- Considerations for Public Hot Tub Operators
- Considerations for Vacation Rental Owners and Managers

https://www.cdc.gov/legionella/downloads/fs-legionnaires.pdf

www.cdc.gov/legionella-Developing a Water Management Program to Reduce Legionella Growth & Spread in Buildings June 24, 2021

LEGIONNAIRES' DISEASE

Legionnaires' (LEE-juh-nares) disease is a very serious type of pneumonia (lung infection) caused by bacteria called *Legionella*. If you develop pneumonia symptoms and may have been exposed to *Legionella*, see a doctor right away. Be sure to mention if you have used a hot tub, spent any nights away from home, or stayed in a hospital in the last two weeks.

Legionnaires' Disease Can Cause Pneumonia Symptoms

Signs and symptoms of Legionnaires' disease can include:

- Cough
- Muscle aches
- Fever
- Shortness of breath
- Headache

Doctors use chest x-rays or physical exams to check for pneumonia. Your doctor may also order tests on a sample of urine and sputum (phlegm) to see if your lung infection is caused by *Legionella*.

Legionnaires' Disease Is Serious, but Can Be Treated with Antibiotics

Legionnaires' disease is treated with antibiotics (drugs that kill bacteria in the body). Most people who get sick need care in a hospital but make a full recovery. However, about 1 out of 10 people who get Legionnaires' disease will die from the infection.

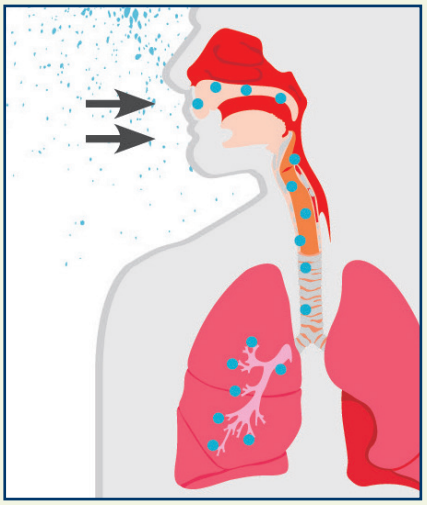
Certain People Are at Increased Risk for Legionnaires' Disease

Most healthy people do not get Legionnaires' disease after being exposed to *Legionella*. Being 50 years or older or having certain risk factors can increase your chances of getting sick. These risk factors include:

- Being a current or former smoker
- Having chronic lung disease, such as emphysema or chronic obstructive pulmonary disease (COPD)
- Having a weakened immune system from diseases like cancer, diabetes, or kidney failure
- Taking medication that weakens your immune system

Legionella Are Usually Spread through Water Droplets in the Air

In nature, *Legionella* live in fresh water and rarely cause illness. In man-made settings, *Legionella* can grow if water is not properly maintained. These man-made water sources become a health problem when small droplets of water that contain the bacteria get into the air and people breathe them in. In rare cases, someone breathes in *Legionella* while they are drinking water and it "goes down the wrong pipe" into the lungs. In general, people do not spread Legionnaires' disease to other people.



Legionnaires' disease, a type of severe pneumonia, is caused by breathing in small droplets of water that contain *Legionella*.

Commons Sources of Infection

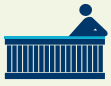
Outbreaks of Legionnaires' disease are often associated with large or complex water systems, like those found in hospitals, hotels, and cruise ships.

The most likely sources of infection include:

Water used for showering (potable water)

Cooling towers (parts of large air conditioning systems)

Decorative fountains



Hot tubs

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

TIPS FOR MEETING LEGIONELLA REQUIREMENTS IN SKILLED NURSING FACILITIES

The bacterium Legionella can cause a serious type of pneumonia called Legionnaires' Disease in individuals at risk, such as those who are at least 50 years old, smokers, or with underlying medical conditions such as chronic lung disease or immunosuppression. Legionella can grow in parts of building water systems that are continually wet, and certain devices can spread contaminated water droplets via aerosolization. To reduce the risk of the spread of Legionella in LTC, facilities need to have a water management plan and a process to make sure the plan is being followed. This is why the Centers for Medicare and Medicaid Services (CMS) have regulations[1] that require facilities to have a water management program (WMP), and CMS Surveyors will review the facilities' WMP and see if it is being followed. Therefore, the facility must monitor to ensure that the WMP practices are implemented, any deviations from practices should be identified, and corrective actions are put in place.

We have listed some tips to meet the components of the regulatory requirements based on a review of common reasons facilities are cited for non-compliance with water management regulations.

Have a Water Management Program with Key Elements Consistent with National Standards

Water management must be based on nationally accepted standards (e.g., ASHRAE (formerly the American Society of Heating, Refrigerating, and Air Conditioning Engineers), CDC, U.S. Environmental Protection Agency, or EPA).[1]

TIP: Make sure the WMP contains the seven key elements as recommended by the CDC: 1) establish a WMP team; 2) describe the building water systems using text and flow diagrams; 3) an assessment to identify areas where Legionella and other opportunistic waterborne pathogens 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 (verification) and is effective (validation); and 7) document and communicate all the activities.[2]

TIP: Establish a WMP team comprised of current facility staff and others designated to assess and review the facility's water system for potential risks associated with waterborne pathogens.

TIP: Examples of an assessment include a description of the building water systems using text and flow diagrams that depict how water is received, processed, and distributed in the facility and include the potable and non-potable (utility) water systems.

TIP: Look for areas where Legionella and other opportunistic waterborne pathogens can spread such as:

- Laundry
- Irrigation of grounds
- Bathing / spa pools
- Food preparation (including ice making)
- Toilet flushing
- Drinking (including feeds into ice machines and water dispensers)
- Decorative fountains
- Clinical uses (e.g., dialysis, irrigation of wounds, etc.)
- Cooling towers
- Firefighting and fire suppression (including sprinklers)
- Hot water storage

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Have a Water Management Program with Key Elements Consistent with National Standards (cont.)

TIP: Ensure the facility's ice machine is maintained per manufacturer's guidelines. Not following guidelines can cause potential spread of waterborne diseases such as Legionella (microbe that causes Legionnaires' disease, is a severe form of pneumonia — lung inflammation) if the ice machine is not sanitized per manufacturer's guidelines.

TIP: Include control measures such as visible inspections, use of disinfectant, temperature (that may require mixing valves to prevent scalding), monitor water temperature and chlorine levels, flushing low-flow pipe runs and dead legs (piping subject to low or no flow because of design or decreased water use) at least weekly, and flush infrequently used fixtures regularly.[3]

TIP: The WMP requires regular monitoring of key areas for potentially hazardous conditions and should also include established ways to intervene when control limits are not met.[2] For example, if there is a water main break near the facility, it may be recommended to flush water at multiple sinks and fixtures at predetermined flushing locations per the water management program, and increase frequency of measuring chlorine levels to ensure that the water is effectively treated and free from pathogens that could pose a risk to residents, staff, and visitors.

TIP: Hot and cold water temperatures should be checked monthly at various points throughout the water system.

TIP: Maintain hot water temperature at the return at the highest temperature allowable by state regulations or codes, preferably ≥124°F (≥51°C), and maintain cold water temperature at <68°F (<20°C).[4]

TIP: Make sure to record these temperatures so they can be monitored over time to help improve the management of legionella risks and the control processes in place. Note that the prime temperature for the bacteria to proliferate at is between 68–113°F (20–45°C).

Verification and Validation of the WMP (as defined in ASHRAE Standard 188 – 2018.[5])

TIP: Verification is a Quality Assurance (QA) function and is confirmation that the WMP has been implemented as designed.

TIP: Prove with evidence in documentation that program controls are being implemented as designed. This effort increases the defensibility for your WMP.

TIP: Validation is a Quality Control (QC) function and is confirmation that the WMP is effective when implemented as designed and controls the hazardous conditions throughout the building water systems.

TIP: Make sure your facility's policy and procedure match current practice. Provide education and training to ensure compliance with the WMP. Make sure to document and communicate all activities.

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Testing for Legionella

At this time, CMS does not require routine water cultures for Legionella or other opportunistic waterborne pathogens as part of routine program validation.[1]

TIP: There may be instances when water cultures are needed (e.g., as part of an investigation following a case of healthcare-associated legionellosis or a potential outbreak of legionellosis in the facility).

TIP: If while hospitalized a resident is discovered to have a legionella infection, testing of the water supply may be necessary to investigate the possible source.

TIP: If testing is conducted, make sure to document the results.

What to Do in Case of an Outbreak

Legionellosis outbreaks are generally linked to locations where water is held or accumulates and pathogens can reproduce, including those found in long-term care facilities. Transmission from these water systems to humans occurs when the water is aerosolized (e.g., converted into a spray/mist in the air).

TIP: The facility should contact the local/state public health authority if there is a single case or more of healthcare-associated legionellosis or an outbreak of an opportunistic waterborne pathogen causing disease. The facility must follow public health authority recommendations including remediating the pathogen reservoir and adjusting control measures as needed.[1,6]

TIP: The facility should work with local/state public health authorities, if possible, to determine if the WMP requires modifications to prevent the growth of Legionella or other opportunistic waterborne pathogens in the future or if some steps in the WMP were not correctly or consistently implemented once the issue was identified.[1,6]

Additional Resources

CDC — Controlling Legionella in Potable Water Systems

CDC — Worksheet to Identify Buildings at Increased Risk for Legionella Growth and Spread

CDC — Healthcare Water Management Program Frequently Asked Questions

Legionella Control — How to Check Water Temperatures to Minimize the Risk of Legionella Bacteria

Interested in joining the National Infection Prevention Forum? LEARN MORE

1 CMS — State Operations Manual Appendix PP from 2-3-23, page 771
2 CDC — Overview of Water Management Programs
3 CDC — Toolkit: Developing a Water Management Program to Reduce Legionella Growth and Spread in Buildings
4 CDC — Guidance for Monitoring Building Water
5 ASHRAE — ANSI/ASHRAE Standard 188-2018, Legionellosis: Risk Management for Building Water Systems
6 CDC — Things to Consider: Outbreak Investigations — General Considerations

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