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Safeguarding Water in Healthcare Facilities

A Guide to ASHRAE 514 Compliance

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Welcome to our white paper focusing on ANSI/ASHRAE Standard 514. In healthcare facilities, occupants are often at higher risk from microbial hazards and their associated dangers. This document discusses Standard 514 with information on risk management tailored to healthcare environments. It outlines minimum requirements and offers informative guidance for the development of water management programs.

Engineers, facility managers, and contractors who specify or install fixtures in healthcare facilities should be aware of the microbial, physical, and chemical hazards included in the new standard – and recommended controls – because some measures to prevent risks can actually make them more likely.

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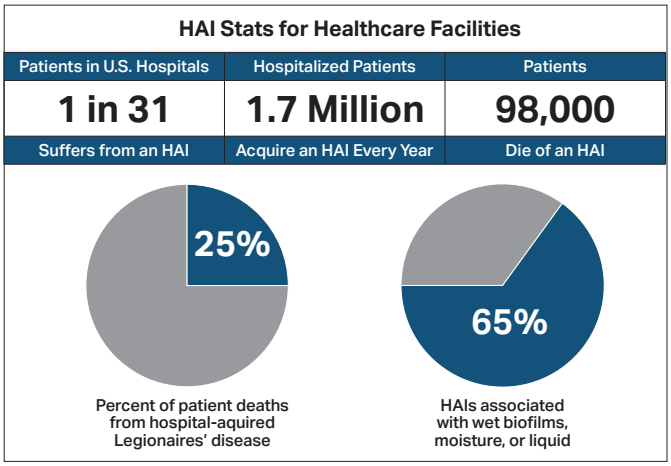
Safeguarding Water in Healthcare Facilities:
A Guide to ASHRAE 514 Compliance

No healthcare facility chooses to become a statistic. Yet every day, 1 out of 31 patients in U.S. hospitals suffers from a hospital-acquired infection (HAI), according to the Centers for Disease Control and Prevention (CDC).[1] That adds up to 1.7 million hospitalized patients annually who acquire HAIs while being treated for other issues—and more than 98,000 die.[2]

Studies estimate that 65% of HAIs are associated with wet biofilms, moisture, or liquid —and HAIs are frequently deadly for patients. For example, Legionnaires' disease is fatal for about 10% of the people who contract it, but that rises to 25% for healthcare-acquired Legionnaires' disease.



Engineers and purchasers who specify plumbing fittings for new construction or renovation in hospitals must manage water risk, whether that's disease caused by Legionella and other pathogens or scalding from high-temperature water. The choice of control measures can prevent disease and injury by streamlining water management plans and testing programs and can directly benefit human health and life.

In 2019, global public health organization National Sanitation Foundation (NSF) International transferred facilitation of NSF Standard 444, *Minimizing Risk of Disease and Injury Associated with Building Water Systems*, to ASHRAE to complete the standard development process and publish it as ASHRAE Standard 514.

To address water risks, the American National Standards Institute (ANSI) and the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) introduced a new standard in July 2023. The standard is referred to as ANSI/ASHRAE 514 or simply ASHRAE 514.

ANSI/ASHRAE 514
Builds on Previous Standards

ANSI/ASHRAE 514: Risk Management for Building Water Systems: Physical, Chemical, and Microbial Hazards

This standard provides a framework for owners and managers to systematically develop water management plans to handle disease outbreaks and hazards that could become public health and safety issues.

The Centers for Medicare & Medicaid Services (CMS) requires water management plans for every type of healthcare facility. Further, ASHRAE 514 creates an industry standard to prevent both illness and injury. A facility manager who chooses not to follow the guidelines could be legally liable if an incident occurs. Becoming familiar with the ASHRAE 514 standard and how to implement it to manage risk is essential.

ASHRAE 514 requires adhering to all elements of ASHRAE 188: *Legionellosis: Risk Management for Building Water Systems*[5] and ASHRAE Guideline 12: *Managing the Risk of Legionellosis Associated with Building Water Systems.*[5] ASHRAE 514 incorporates the same best practices for managing risks associated with *Legionella*—which remains the priority—along with other pathogens.

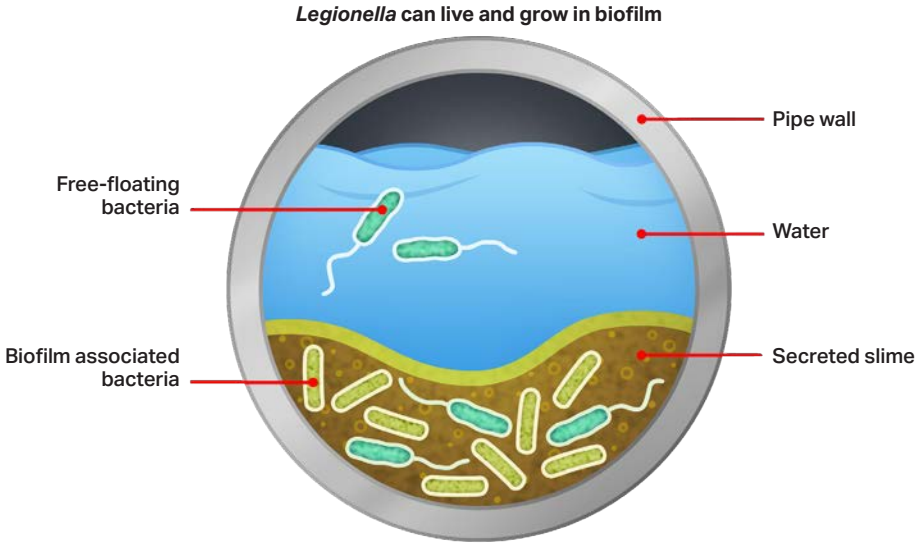


Image courtesy of CDC.gov

But ASHRAE 514 goes beyond ASHRAE 188 to address microbial risk more broadly, as well as physical and chemical hazards found in water systems. In particular, ASHRAE 514 adds testing for a number of waterborne pathogens and antibiotic-resistant bacteria, including *Pseudomonas aeruginosa, Stenotrophomonas maltophilia, Acinetobacter species, Burkholderia cepacia,* and *nontuberculous mycobacteria*.

ASHRAE 514 also addresses physical hazards. For instance, the majority of injuries and deaths involving tap water scalds occur to children under the age of five and senior citizens—and they're particularly vulnerable, because their thinner skin results in deeper burns for the same temperature and exposure time. Adults will suffer third-degree burns if exposed to 150^{0}F water for 2 seconds or 140^{0}F water for 6 seconds. To alleviate risk, the U.S. Consumer Product Safety Commission recommends lowering the water heater temperature to 120^{0}F.

In addition, chemical hazards arise from disinfectants, disinfection byproducts, corrosion products, and chemicals that cause leaching from plumbing materials. These substances can stick to pipes to form biofilms, letting organisms persist for long periods—if they can be removed at all.

Building Water Systems
Prove Ideal for Growing Microbes

Building water systems are almost custom-made for *Legionella* and other waterborne pathogens to thrive.

Not surprisingly, the older the facility, the less likely the Architecture/Engineering/Construction team considered the risk of exposure to HAIs. Typical hospital water systems exhibit a high pipe surface area-to-volume ratio, perfect for forming biofilms that sustain vast microbial populations. Corrosion byproducts and sediment provide a steady source of the nutrients they need. And dead legs – pipes isolated from regular water flow or no longer in use – let water stagnate, giving microbes a perfect place to grow undisturbed.

Similarly, conserving water and saving money with low-flow faucets or water-restriction devices also increases water age and stagnation, which is ideal for incubating pathogens. The longer water remains in a hospital water system, the greater the decline in residual disinfectant that could kill pathogens.

In short, a high pipe surface area-to-volume ratio with dead legs, corrosion and chemical byproducts, and a lower flow rate – all common in hospitals – can set the stage for a disease outbreak. And measures to prevent disease and injury may make them both more likely.

Protective Measures
May Help Microbes Survive

Technology and practices to protect staff and patients can actually contribute to water contamination.

For instance, the use of hand sanitizer instead of hand washing, especially since the COVID-19 pandemic, results in low water use and aged water in the lines and fittings.

Examples that contribute to water contamination include the following:

- **Indirect transmission from supplies** that had contact with contaminated water: bath supplies and linens, inappropriate use of nonsterile water for tasks that warrant higher measures of caution, such as oral/tracheostomy care of ventilated patents and rinsing of respiratory therapy or endoscopic equipment in tap water.
- **Transmission on the hands of healthcare personnel:** failure to perform hand hygiene after contact with a contaminated environment or patients colonized with waterborne organisms, hand washing with contaminated water and splashback from contaminated sink drains.[7]

- The greater **complexity of touchless faucets** relative to manual faucets puts more surface area in contact with water. For more than two decades, researchers have suspected that these no-touch fittings may create conditions that allow *Legionella* and *Pseudomonas aeruginosa* to proliferate, as reported in 2001 in the *Journal of Hospital Infection*.[8]
- Likewise, the **long, flexible hoses** frequently used on hospital showers store and stagnate water, encouraging microbial growth. In addition, modern faucets contain more plastic and elastomeric materials, ideal to grow microbes.

- **Temperature** also plays a critical role. To meet both conservation and safety guidelines, many facilities have implemented technologies to **reduce water flow and temperature**. But low flow means fewer pathogens are flushed away—and, to a point, low temperature keeps more pathogens alive. Although turning down the water temperature to 120^{0}F to avoid scalding saves the energy—and money—needed to heat water, microbes like *Legionella* can survive several hours at this temperature. For instance, at 122^{0}F, 90% of *Legionella* die within 2 hours; at 140^{0}F, 90% are killed within 2 minutes. Only at 160^{0}F are 100% killed instantly.[9]

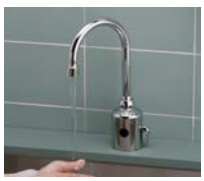
Plumbing Innovations and Advances
Help Prevent Disease and Injury

Measures facility managers can take to keep patients and staff safe from waterborne HAIs:

- **Maintain optimal water temperature and pressure and eliminate dead legs.**
  Legionella and other microbes are right at home in stagnant warm water. So maintain the water at an unhospitable temperature and remove pipes that are never used—or flush regularly if you use them occasionally.
- **Separate hot-water and cold-water lines completely. Install thermostatic mixing valves as close as possible to the point of use to minimize the volume of tempered water sitting in pipe or tubing and prevent scalding.**
  Store hot water at temperatures above 140°F and circulate continuously above 120°F, per the CDC. Use pipe insulation to maintain hot and cold water at desired temperatures throughout the water system.[10]
- **Store and circulate cold water below the favorable temperature range for *Legionella*.**
  Although *Legionella* may grow at temperatures as low as 68°F, they multiply between 77°F and 113°F, according to the CDC.[10]
- **Minimize stagnation in faucets. Stagnant water fosters the growth of biological material that feeds *Legionella* and corrodes water system hardware, creating a haven for bacteria.**
  Advanced fittings provide automatic flush activation set to the desired frequency and duration to prevent stagnation brought on by low use and flow rates. Flushing lets the faucet remove water in low-traffic areas, reducing water age and ensuring complete distribution of chemical treatment.
- **Choose antimicrobial design features and materials.**
  For example, a faucet that uses a laminar flow outlet that does not draw air into the water stream, resulting in a clear, airless flow. The natural protection of materials containing silver prevents growth of a broad range of microorganisms.
- **Prevent stagnation and pooling of water in the shower.**
  Choose automatically draining shower valves and hand spray hoses that remove stagnant water from the system. These work with either a shower head or a hand shower.
- **Select shower heads designed to reduce flow aerosolization.**
  Preventing air from entering the shower head minimizes aerosols that transmit *Legionella*. In addition, silicon valves reduce chlorine oxidization as well as scale and organic sediments.
- **Provide a means to easily remove and disinfect shower heads.**
  Aerators are prohibited. Utilize self-draining showerheads, constructed from metal.

Measures to prevent injuries from scalding include the following:

- **Specify American Society of Sanitary Engineering (ASSE) 1070-certified mixing valves and scald protection.**
  ASSE1070 Standard "Performance Requirements for Water Temperature Limiting Devices" was published in 2004. To reduce the risk of scalding, this industry standard for a temperature-actuated mixing valve limits the maximum temperature to fixtures such as sinks, lavatories, or bathtubs.



- **Choose a touchless faucet with user adjustable temperature control.**
  Users can adjust the faucet to set the preferred mixed water temperature. An integrated ASSE 1070-certified thermostatic mixer can prevent scalding and is a quick, cost effective installation with fewer leak points.

- **Specify ASSE 1016-certified valves for showers and tub-shower combinations.**
  Valves can be pressure-balancing, thermostatic or combination pressure-balancing/thermostatic. In-line thermostatic valves may not be utilized to meet this standard. Valves must provide scald and thermal shock protection for the rated flow rate of the installed shower head. The valve must limit the maximum setting to 120° F and have a maximum temperature limit stop set prior to occupancy. The limit stop must be checked and adjusted seasonally to reflect changes in cold water temperature.

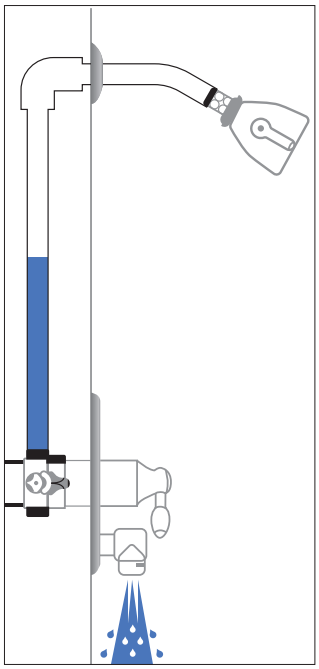
Plumbing Innovations and Advances
Help Prevent Disease and Injury

Select fittings that meet standards and help keep patients and staff safe.

Look for plumbing fittings, shower devices, and water treatment technologies designed to reduce infection rates, prevent scalding, and keep dangerous bacteria from crossing from the hot supply into the cold supply and back into the plumbing system.

For example, HyTronic® Patient Care touchless faucets can reduce common risks in healthcare environments and exceed expectations for water management and patient safety thanks to the following features:

- Automatic conditions-based flushing reduces stagnation and ensures complete distribution of chemical treatment
- Copper tubing inlets lessen the opportunity for waterway bacterial growth
- A low-volume solenoid valve minimizes the amount of stagnant water
- Antimicrobial silver outlet guards against microbial growth
- Angle stops with integral checks prevent potentially dangerous crossflow
- Optional ASSE 1070-certified thermostatic mixing valves provide point-of-use scald prevention with hot water bypass for thermal disinfection procedures



With an Auto-Drain™ shower, the water automatically drains from the system after each use.

Auto-Drain™ Shower Systems remove stagnant water in the column between the shower valve and showerhead in just one minute, helping to stave off HAIs.

These systems are available with a shower valve and hand spray hose that drain automatically when shut off, plus a diverter valve that allows the entire shower fitting to purge stagnant water. Retrofit kits to replace an existing shower hand spray are also available.

It can be specified with Thermostatic/Pressure Balance Valve, or Pressure Balance Valve with either an integrated valve drain or a separate drain valve . Automatic valve drain assemblies in the shower hose and shower valve drain water after each use. This simplifies the draining process and limits the growth of water pathogens. In addition, the Auto-Drain hand-held shower spray with hose includes an integrated hose valve drain to drain the shower hose automatically after each use. This simplifies the draining process and limits the growth of water pathogens.

Codes and Keywords
For Healthcare Facility Water Systems

ANSI/ASHRAE Codes for Water System Risk Management

- ASHRAE Standard 514-2023: Risk Management for Building Water Systems: Physical, Chemical, and Microbial Hazards
- ASHRAE Standard 188-2021: Legionellosis: Risk Management for Building Water Systems
- ASHRAE Guideline 12-2023: Managing the Risk of Legionellosis Associated with Building Water Systems

ASSE Codes for Scald Prevention

- ASSE 1070 Standard, Performance Requirements for Water Temperature Limiting Devices
- ASSE 1016 Standard, Performance Standards for Automatic Compensating Valves for Individual Showers, Tub/Shower Combinations

Keyword Definitions

Aerosolization: Aerosolization is the process or act of converting some physical substance into the form of particles small and light enough to be carried in air. It is critical in Legionellosis, which is most commonly transmitted by inhalation of contaminated aerosols in conjunction with water sprays, jets, or mists.

Antibiotic-resistant bacteria: Germs like bacteria and fungi that develop the ability to defeat the drugs designed to kill them.

Biofilm: Clusters of bacteria attached to a surface and/or to each other and embedded in a self-produced matrix of proteins, polysaccharides, and DNA.

Flushing: Replacing stagnant water in building systems that have had low or no water use with fresh water to reduce the risk of infections.

Hospital-acquired infection (HAI): Also known as healthcare-acquired infection, these originate in a hospital and were not present or incubating at the time of patient admission.

Legionnaires' disease: A serious type of pneumonia caused by *Legionella* bacteria. People can get sick when they breathe in small droplets of water or accidently swallow water containing *Legionella* into the lungs.

Legionella Water Management Plan: A plan to identify hazardous conditions and include steps to reduce the risk and danger of *Legionella* and other microbes growing in a building water system. Per the Centers for Disease Control and Prevention, having a water management program is now an industry standard for large buildings in the United States.

Scalding: Damage to the skin caused by something wet, such as hot water or steam.

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Automated Flushing for Healthy Buildings

Regular Automated Flushing
Keeps Building Water Healthier

All life depends on water—including harmful pathogens, such as Legionella, Pseudomonas spp., and nontuberculous mycobacteria. That makes water an excellent disease carrier, especially when it's stagnant, tepid, or both.

These no- and low-flow conditions often occur in building water systems—in a school or residence hall during summer break, an office building closed over a holiday or due to a pandemic, or a hospital room unused for weeks or even a few days.

During these periods, water will take longer to flow from the system entry to where it's ultimately consumed—if it moves at all. Areas where the water stagnates give bacteria and microorganisms an ideal environment to proliferate and concentrate to levels that can cause infections and health issues for building occupants. ***Legionella*** *is the best known of building-related diseases, but occupants may also be subject to other lung, skin, and gastrointestinal infections. Risk is especially high for individuals who are immunocompromised or elderly. Significantly, conditions for accelerated growth of waterborne pathogens don't occur only during low occupancy.*

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Combatting Pathogens
with Flushing

Building managers established flushing protocols to help combat growth of bacteria, including *Legionella*. Line flushing proved to be the easiest, quickest, and cheapest way to prepare for occupants to safely return to a building.

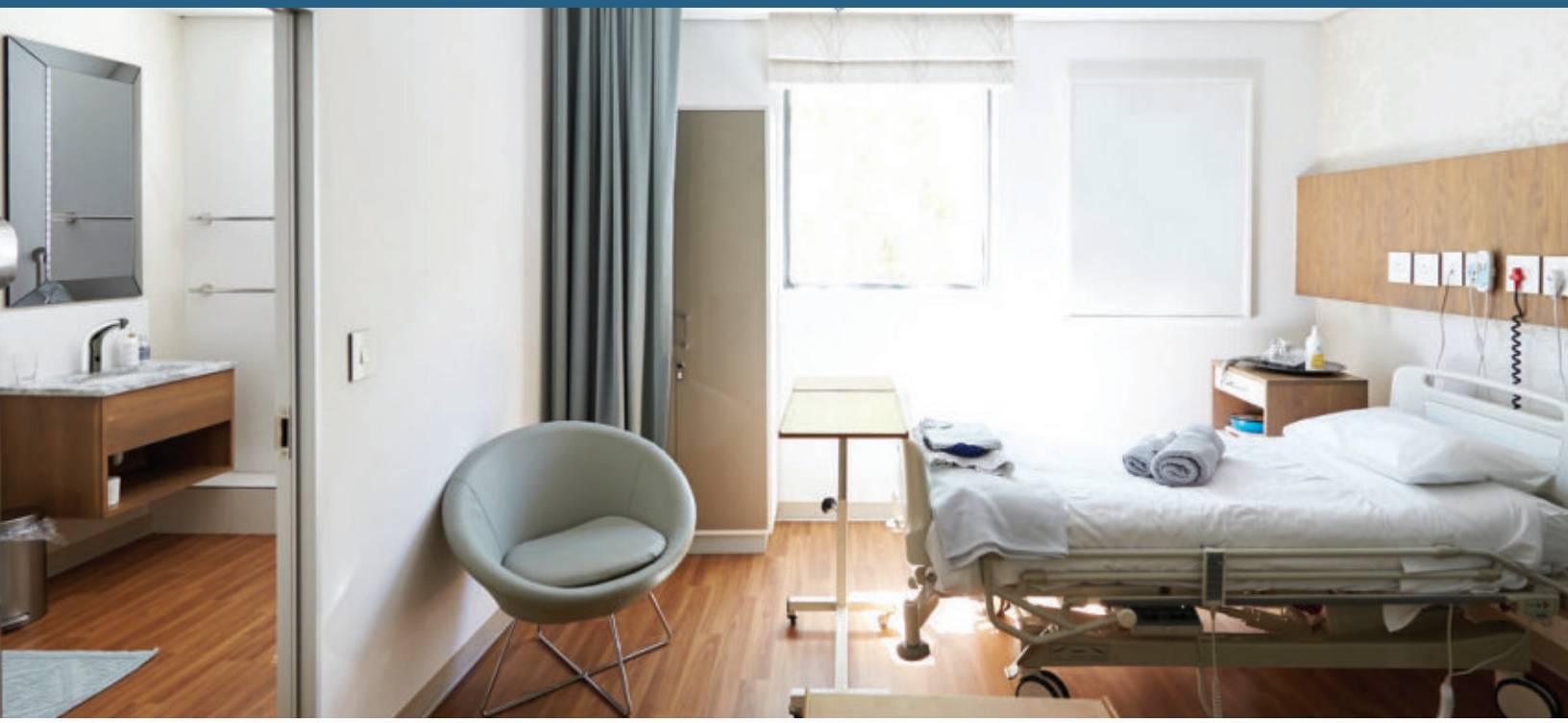
But building water circulation can be poor or inconsistent even during business as usual. For example, if hospital personnel choose hand sanitizer over hand washing, water use could be lower. Also, facility managers may implement conservation measures that save water and energy but require lower water flow and temperature. That could increase *Legionella* risk.

In March 2024, the Water Research Foundation published a report on a project assessing flushing as a corrective action and ongoing control strategy to reduce *Legionella* levels in service lines and premise water systems.[1] The report describes several factors that encourage *Legionella* survival and growth. First are biofilms in building pipes that provide the carbon and nutrients the bacteria need to proliferate. Second is water temperature between 70ºF to 120ºF (20ºC to 50ºC), which provides a hospitable environment for *Legionella*. Third is loss or absence of residual disinfectant over time.

The researchers note that flushing helps expel accumulated biomass, keep water temperature outside the range where *Legionella* bacteria are active, replenish residual disinfectant to an effective concentration, and reset water age. The report details baseline information to gather before flushing and general recommendations for flushing efficacy.

Additional considerations include flushing frequency and timing.[2] The researchers recommend a maximum water age of 7 days if residual disinfectant is present and 3 days if not. Flushing should be conducted before water users could be exposed to *Legionella* and outside normal or peak hours of use to minimize hazards.

Sorting Out Standards, Regulations, Guidelines,
and Best Practices for Flushing



The industry agrees that flushing complements supplemental disinfection, and water management plans should include a protocol for regular flushing. There has yet to be a consensus on exactly what that should entail, but numerous standards, guidelines, regulations, and authorities require or recommend flushing regularly for various types of facilities. Here are examples of just a few:

- **Joint Commission:** The Joint Commission, a global driver of quality improvement and patient safety, established water management standard EC.02.05.02 on January 1, 2022. In addition to the already required risk assessment, water management plan, testing protocols, and acceptable ranges, the Joint Commission saw a need for more specific requirements for a water management program, including development, management, and maintenance activities such as flushing, and an annual review.[3]

- **Veterans Health Administration:** Directive 1061 requires that irregularly used or low-flow fittings such as sink taps and showers must be flushed at least twice weekly to prevent water stagnation. If this method is used, the facility must put a policy and procedure in place to document flushing and maintain the files for at least three years to ensure compliance.[4]

- **ASHRAE 514:** For system maintenance, ASHRAE 514 recommends regularly flushing building water systems to reduce water age and achieve microbial control. Conditions that warrant flushing include systems where there are dead legs, during periods when a building is shut down, during low or no occupancy, and when portions of the building water system are not used.[5] The U.S. General Services Administration[6] confirmed that at approximately 350 federally owned facilities that meet criteria established in ASHRAE Standard 514 for height and size, they are developing and implementing building-specific water sampling and flushing plans based on ASHRAE recommendations.[7]

"Flushing helps maintain water quality by preventing water stagnation in pipes and reducing the risk of metal accumulation and *Legionella* growth. This proactive measure helps safeguard the health and well-being of occupants, particularly vulnerable populations in childcare centers and healthcare units, by promoting clean and safe water usage.[8]"

Managing Building Water System Flushing

Preventing biofilm growth is easier than controlling it once it's already coating pipes. So regardless of building occupancy, flushing regularly is a good practice—to remove biofilm, maintain water at temperatures inhospitable for *Legionella*, increase disinfectant residual, and reset water age. It's a nontoxic and environmentally friendly way to mitigate risks of waterborne pathogens. Also, standards organizations agree that flushing is vital to a defensible water management program. In stop-and-go school schedules, for example, an ongoing flushing program can keep water moving without installing or maintaining water treatment equipment or developing complex protocols.

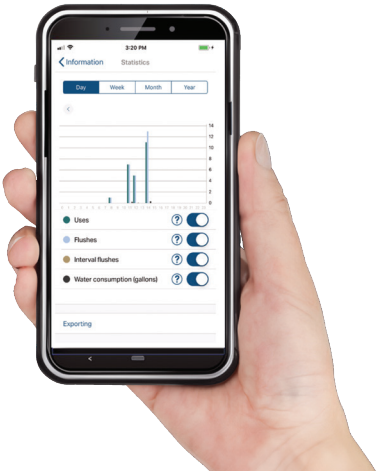
Flushing does not corrode pipes or fittings, potentially extending the life of plumbing equipment. And there's a bonus—flushing doesn't require consumables like chemicals. With the right sensors, facility managers can activate flushing on a regular program or as-needed basis depending on occupancy fluctuations, room turnovers, and even fixture usage.

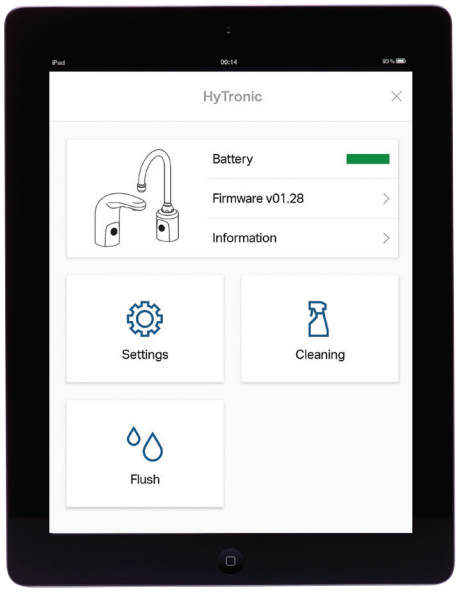
Advantages of Automatic Over Manual Flushing for Faucets with Bluetooth® Low Energy Technology

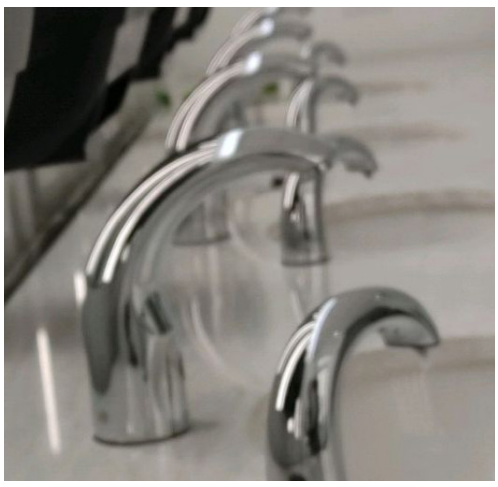
Selecting Automatic Flushing Features
for Streamlined Water Management

Automatic flushing offers a range of benefits, but the specific features depend on the faucet and control application you choose. You'll want a combination with a range of operational modes and data reporting capabilities to deliver time, energy, and water savings. Look for the following capabilities:

- **Maximize performance with the ability to adjust and control faucets using a smartphone or tablet and an easy-to-use mobile app.** Look for the capability to change settings like flow rate or operating mode, allow easy cleaning, or perform routine maintenance with a flush for up to 10 minutes.
- **Keep water lines clear and fresh by scheduling advanced hygiene flushes.** Consider the flexibility to flush at regular intervals, at a predetermined time from last use, or if a minimum amount of water has not passed through the faucet during a predetermined interval. Also, be sure you have pipe flush mode for longer purges that support remediation.
- **Simplify operations by saving flush modes using settings in the app.** After naming each mode as a pre-set, you can use them to transfer settings to other faucets in your facility.
- **Get the flexibility to set the faucet operating mode depending on location and usage.** For example, flush modes might include normal, scrub, metering, watersaver, handwash, or volume.
- **Organize and simplify maintenance with automatic documentation of which faucets were flushed or need updates, and easy download of usage logs.** Valuable capabilities let you match locations for easy individual or group identification, search for faucets in range when you're nearby, or select previously paired faucets.
- **View and download analytics with detailed information on each faucet.** For example, you can view bar graphs for daily, weekly, monthly, and annual activity, including flushes, uses, and water consumption. You can export use logs into Excel or share findings with others.







Codes and Keywords
For Healthcare Facility Water Systems

Codes Discussed in this Paper

Joint Commission Water Management Standard EC.02.05.02
A new water management program standard for the Hospital, Critical Access Hospital, and Nursing Care Center

Veterans Health Administration Directive 1061
A directive for prevention of health care-associated *Legionella* disease and scald injury from water systems

ANSI/ASHRAE Standard 514 for Water System Risk Management
Minimum requirements for managing building water system risk and a framework for systematically developing water management programs, from design and construction to occupancy

Keywords for Healthcare Facility Water Systems

Flushing: Replacing stagnant water in building systems that have had low or no water use with fresh water to reduce the risk of infections.

Biofilm: Clusters of bacteria attached to a surface and/or to each other and embedded in a self-produced matrix of proteins, polysaccharides and DNA.

Water management plans: A plan to reduce the risk and danger of *Legionella* and other microbes growing in a building water system.

Legionella: The bacteria that causes Legionnaire's disease, a serious type of pneumonia. People can get sick when they breathe in small droplets of water or accidently swallow water containing *Legionella* into the lungs.

Dead legs: Pipes isolated from regular water flow or no longer in use.

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[5] "Risk Management for Building Water Systems: Physical, Chemical, and Microbial Hazards," ANSI/ASHRAE Standard 514-2023, accessed May 28, 2024, https://www.ashrae.org/technical-resources/standards-and-guidelines/guidance-for-water-system-risk-management

[6] "Water quality: Federally owned facilities," U.S. General Services Administration, last updated January 31, 2024. https://www.gsa.gov/real-estate/facilities-management/water-quality-management/federally-owned-facilities

[7] "Guidance for Water System Risk Management," ASHRAE, accessed March 23, 2024, https://www.ashrae.org/technical-resources/standards-and-guidelines/guidance-for-water-system-risk-management

[8] "Water quality: Federally owned facilities," U.S. General Services Administration, last updated January 31, 2024. https://www.gsa.gov/real-estate/facilities-management/water-quality-management/federally-owned-facilities

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CHICAGO FAUCETS®
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Addressing the Prevention of Healthcare-Acquired Infections

Through Water Management Solutions

Includes New Joint Commission Standard
for Water Management Program and
ANSI/ASHRAE Standard 188-2021

Table of Contents

Introduction

Water is the foundation of all lifeforms, including bacteria and microscopic parasites, such as giardia.[1] Normal tap water contains microbes and other bacteria, but they ordinarily fall within the safe limits set by federal and local authorities, presenting little risk for day-to-day consumption. These limits are defined by legally enforceable primary standards to help protect public health by limiting the levels of contaminants in drinking water.[2]

In healthcare environments, water can become a source of Healthcare-Acquired Infections (HAI) – also called nosocomial infections. Patients remain vulnerable to infections in hospitals and other medical facilities since medical professionals must utilize water not only during patient treatments but should be washing their hands after encountering each patient. If these medical professionals aren't practicing proper handwashing and drying techniques, it can lead to the spread of bacteria and other pathogens which thrive in moist environments. As a critical form of HAI prevention, those in charge of water management programs in healthcare facilities need to monitor the effects of controls for surface and transport system contamination closely.

Healthcare plumbing systems can assist in the growth of microbes within the water supply, quickly leading to an increase of infections in the facility. Everywhere the hospital uses water becomes a potential source for spreading waterborne pathogens and antibiotic-resistant bacteria. With a variety of different types of plumbing fittings, shower devices and water treatment technologies available to reduce infection rates, medical facilities have plenty of options worth considering.

[1] CDC https://www.cdc.gov/parasites/giardia/index.html

[2] EPA https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations

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Current State of Healthcare-Acquired Infections

The Centers for Disease Control and Prevention (CDC) closely monitors the current state of HAIs using the National Healthcare Safety Network (NHSN). Their latest estimates indicate that on any given day, **1 out of 31 patients** suffers from an HAI in the nation's hospitals. With such a high risk of infection, the staff at hospitals and healthcare facilities need to ensure they take every precaution to reduce the rates of HAI exposure to their patients.

For some facilities, this may be problematic due to the historical design and the age of the water system in the building. Since medical research only began highlighting the risks of waterborne pathogens in the last 20 years, the older the facility is, the less likely it took the risk of exposure to HAIs into account during construction.

CDC Monitoring and Prevention Initiatives

Beginning in 2009, the CDC ran a project to establish the rates of infection and determine the efficacy of their proposed controls. To date, they conducted surveys in four different phases and collected data on HAIs in 2009, 2010, 2011, and 2015, publishing the latest results in a series of reports.

The latest findings (released in 2018[3]) indicated slight improvements in infection prevention techniques, such as proper placement and maintenance of central-line tubes placed in large veins in participating patients that need an IV placed near the center of the body for either medication or fluid distribution, blood draw, or administering intravenous nutrition.

While there were positive results in infection reduction since 2009, a point-prevalence analysis – which is a measure of the proportion of people in a population currently suffering from a specific disease or condition at a particular time – showed that from 2011 to 2015, HAIs only dropped by 0.8% although the types of infections varied significantly between 2011 through 2015.

[3] https://www.cdc.gov/hai/pdfs/progress-report/2018-Progress-Report-Executive-Summary-H.pdf

CDC Monitoring and Prevention Initiatives

The focus since 2011 was to reduce exposure to antimicrobial-resistant pathogens using reporting requirements and preventive controls. The 2015 surveys specifically targeted the same hospital locations and wards but increased the number of facilities from 183 in 2011 to 199 for that phase. It pointed to a decrease in surgical-site and urinary tract infections during this period, with almost no change to incidents of pneumonia infections. The CDC also calculated that patients were 16% less likely to fall victim to an HIA during an extended stay in the nation's hospitals.

The CDC's program seeks to understand the number of HAIs occurring, determine the types of different HAIs, monitor how the facility prescribes antimicrobial drugs, and which antimicrobial drugs they regularly prescribe to their patients. Using this data, the CDC then issues preventive controls and reporting standards for facilities under the NHSN.

Sources and Types of Hospital-Acquired Infections

By definition, nosocomially acquired infections aren't present during admission to the facility but incubate while the patient is receiving care (usually between 48 and 72 hours after intake). The risk of acquiring an infection depends on the patient's immune status, the facility's prevention and control practices, and which pathogens are prevalent within the local region.

Many factors may increase the risk of acquiring an infection. According to the CDC, the primary risk factors for HAIs include the age of the patient, the frequency that they receive care at a facility, the types of care they receive, and the duration of their stay at the facility.

"Not surprisingly, about 20% of all nosocomial infections occur in the intensive care unit."

– Alberto F. Monegro & Hariharan Regunath, October 2018
Source: NCBI

Sources and Types of Hospital-Acquired Infections

Properly identifying the sources of infection within a hospital setting remain a concern for all practitioners and infection prevention professionals. The transfer of pathogens occurs by either direct contact with healthcare staff or from a contaminated environment or medical device. Bloodstream infections remain prevalent, with the primary cause being central-line contaminations originating from skin flora, also referred to as the microorganisms that reside naturally on the skin.

Within intensive care units, gloves alone proved insufficient for limiting the spread of infections and increased the risk of both extended stays and patient mortality. In these high-risk environments, universal standard precautions that require healthcare providers to wash their hands with soap and water or alcohol-based disinfectants before and after visiting every patient proved successful in reducing the number of contact-based HAIs.

Pneumonia is still the most common type of nosocomial infection, with gastrointestinal and surgical-site infections following close behind according to the 2015 survey. Of these, surgical-site infections significantly decreased the most between 2011 and 2015 due to improved protocols and guidelines released by the CDC.[4]

Water-based Healthcare-Associated Infections

The water provided in healthcare facilities can become infectious to patients due to the higher prevalence of pathogens found in these settings, leading to a variety of HAIs. Plumbing systems in hospitals require close monitoring and strict controls to reduce the rates of exposure and infection.

For example, Legionnaire's disease can quickly lead to an outbreak if not detected early. Hospitals require aggressive clinical surveillance systems to identify contaminated water systems. If those monitoring the hospital's plumbing systems discover any pathogens in their facility, it is vital to address the issue immediately. Hand hygiene in healthcare settings is a proactive control measure to prevent the spreading of water-based healthcare-associated infections.

[4] Data Summary 2006-2016 | HAI | CDC

Water-based Healthcare-Associated Infections

Many factors put hospitals at risk for harboring infectious pathogens in their plumbing systems, including:

- Large, complex plumbing systems that quickly migrate infectious pathogens throughout the facility.
- Increased temperatures within the plumbing systems that can contribute to colony growth. Warm, moist environments are ideal for the growth of bacteria.
- Low-flow systems with a propensity to stagnate and incubate pathogens.
- Startup and shutdown procedures that create vibration and release biofilms into the hospital's water supply.

Contamination can also spread from basins, sinks, showers, faucets, and other devices such as humidifiers or hemodialysis equipment to patients. Even the splashback of a running faucet can lead to an outbreak of HAI in intensive care units, and remediation may require the complete replacement of all the plumbing equipment.

Reduction Methods for Water-borne HAIs

To reduce the risk of water-borne HAI exposure requires a multi-pronged approach from hospital designers, engineers, and healthcare professionals at the facility. Engineering resolutions include designing the plumbing, tanks, treatment plants, and disposal systems to reduce the propensity for stagnation, as well as a complete separation between hot water and cold water lines. Additionally, sink and basin designs should seek to prevent high flow over drains, reduced proximity to critical patient care areas, and make use of hands-free faucets wherever possible. See the Facility Guideline Institute's "Guidelines for Design and Construction of Hospitals."

With sensor faucets, patients and staff can avoid physical contact. They are more hygienic than manual faucets since no touch is involved and the transmission of germs is reduced. For additional reduction methods see the article in PHCP Pros: Sensor Faucets, Flush Valves and the Reduction of Waterborne Pathogens.

Reduction Methods for Water-borne HAIs

If any bacteria are present in the system, it's possible to increase the flow strength and length to reduce the chances of spreading infections by removing the faucet aerator or laminar device at the end of the faucet, which could be collecting harmful bacteria due to the stagnation, and the moist environment.

For improved hygiene, the staff must disinfect all basins, faucets, showers, and drains regularly. The CDC strongly recommends using water and detergent or water and enzymatic cleaners prior to high-level disinfection and sterilization procedures. It's also important to provide staff with clean medical devices as soon as possible, as baked or dried material makes disinfection more difficult. For ultrasonic cleaners, washer-sterilizers, and washer-disinfectors, the staff should follow the manufacturer's guidelines exactly. With surface cleaners, the staff must be familiar with the product details such as use-dilution, storage requirements, shelf life, and material compatibility.

Chicago Faucets recommends using non-aerating antimicrobial laminar flow outlets. These almost completely prevent the intake and distribution of contaminated aerosol particles. Faucet aerators help to prevent unnecessary water splashes and reduce the risk of pathogen transmission.

It's also important to keep all central-venous devices – which are devices that are inserted into the body – away from tap water, as bacteria, such as Legionella, can easily collect in these units. Hospitals must test any reported cases of nosocomial pneumonia to see if it's one of the Legionella species of pathogens. If the facility discovers a single case of Legionella-based infection, the hospital staff will need to respond quickly to prevent an outbreak. Those who oversee the hospital's water supply must work together to develop a water management program that will help staff identify hazardous conditions and minimize the growth and spread of Legionella and other waterborne pathogens to patients.[5]

For information on Legionella see these resources:

ASHRAE Legionellosis: Risk Management for Building Water Systems. ANSI/ASHRAE Standard 188–2018. Atlanta, GA; 2015.

United States Environmental Protection Agency. (2000, September). Legionella: Drinking water fact sheet. LEGIONELLA: DRINKING WATER FACT SHEET. Retrieved May 17, 2022, https://www.epa.gov/sites/default/files/2015-10/documents/legionella-factsheet.pdf

Barskey, A. (2020, January 13). Legionnaires' disease surveillance reports 2016-2017. Centers for Disease Control and Prevention. https://www.cdc.gov/legionella/health-depts/surv-reporting/2016-17-report-tables/index.html

Centers for Disease Control and Prevention. (2021, March 25). Legionnaires disease, Pontiac fever fast facts. https://www.cdc.gov/legionella/fastfacts.html

[5] Federal Requirement to Reduce Legionella Risk | CDC 5 https://www.cdc.gov/legionella/wmp/healthcare-facilities/healthcare-wmp-faq.html

U.S. Center for Medicare, and Medicaid Services

Due to continuing concerns over Legionella and other infections, the U.S. Center for Medicare, and Medicaid Services (CMS) requires all hospitals, critical access hospitals, and long-term care centers to develop and maintain a Water Management Plan centered on maintaining the potable water system to prevent/reduce Legionella outbreaks. In June 2017, the CMS released a memo stating that healthcare facilities should develop and adhere to ASHRAE-compliant water management programs. These water management programs help reduce the risk for Legionella and other pathogens in their water systems. This was updated in July 2018 and includes:

CMS Expectations for Healthcare Facilities

CMS expects Medicare and Medicare/Medicaid certified healthcare facilities to have water management policies and procedures to reduce the risk of growth and spread of Legionella and other opportunistic pathogens in building water systems. Facilities must have water management plans and documentation that, at a minimum, ensure each facility:

- Conducts a facility risk assessment to identify where Legionella and other opportunistic waterborne pathogens (e.g. Pseudomonas, Acinetobacter, Burkholderia, Stenotrophomonas, nontuberculous mycobacteria, and fungi) could grow and spread in the facility water system.
- Develops and implements a water management program that considers the ASHRAE industry standard and the CDC toolkit.
- Specifies testing protocols and acceptable ranges for control measures and document the results of testing and corrective actions taken when control limits are not maintained.
- Maintains compliance with other applicable Federal, State and local requirements. Note: CMS does not require water cultures for Legionella or other opportunistic water borne pathogens. Testing protocols are at the discretion of the provider.

Healthcare facilities are expected to comply with CMS requirements and conditions of participation to protect the health and safety of its patients. Those facilities unable to demonstrate measures to minimize the risk of 'Legionnaire's Disease are at risk of citation for non-compliance.

Expectations for Surveyors and Accrediting Organizations

Long-Term Care surveyors will expect that a water management plan (which includes a facility risk assessment and testing protocols) is available for review but will not cite the facility based on the specific risk assessment or testing protocols in use. [6]

[6] QSO17-30-18 (cms.gov)

The Joint Commission

The Joint Commission (TJC) recently updated their standards for health care facilities' water management programs. Starting in January 2022, TJC standards expand on prior expectations that included risk assessments, a water management plan, and testing guidelines to include identified oversight of the program and more specific elements of processing steps, diagrams, and maps of the water system.

New Standards for Water Management Program – Hospitals, Critical Access Hospitals, and Nursing Care Centers

All facilities require a comprehensive water management program that addresses the entirety of risks associated with the hospital's water supply, distribution, point-of-use, and disposal systems. No single resolution can ensure the facility remains safe and reduce exposure to HAIs completely. In The Joint Commission's "New Standard for Water Management Program" the healthcare centers are required to map the plumbing system, identifying all risk areas and remediation protocols.

According to the The Joint Commission, the new water management standard (EC.02.05.02, EPs 1 through 4) went into effect January 1, 2022. 6 The new standard requires that an individual or team be responsible for the oversight and implementation of the water management program, including but not limited to development, management, and maintenance activities. It also specifies required elements to be included in the water management program, such as a basic diagram that maps water supply sources, treatment systems, processing steps, control measures, and end-use points. The water risk management plan is based on the information in the diagram and includes an evaluation of the physical and chemical conditions of each step of the water flow diagram. The standard requires the water management plan to be reviewed annually and when any changes have occurred.

The new standard and EPs are designed to further improve the quality and safety of care provided to hospital patients and nursing care residents who are immunocompromised. This new standard incorporates the latest research and best practices with the primary goal of improving quality and safety in these settings.

The Joint Commission

EC.02.05.02, EP 1
This element of performance went into effect January 1, 2022: The water management program has an individual or team responsible for the oversight and implementation of the program, including but not limited to development, management, and maintenance activities.

EC.02.05.02, EP 2
This element of performance went into effect January 1, 2022: The individual or team responsible for the water management program develops the following:

- A basic diagram that maps all water supply sources, treatment systems, processing steps, control measures, and end-use points. **Note:** An example would be a flow chart with symbols showing sinks, showers, water fountains, ice machines, and so forth.
- A water risk management plan based on the diagram that includes an evaluation of the physical and chemical conditions of each step of the water flow diagram to identify any areas where potentially hazardous conditions may occur (these conditions can most likely occur in areas with slow or stagnant water). **Note:** Refer to the Centers for Disease Control and Prevention's "Water Infection Control Risk Assessment (WICRA) for Healthcare Settings" tool as an example for conducting a water-related risk assessment.
- A plan for addressing the use of water in areas of buildings where water may have been stagnant for a period. (For example, unoccupied or temporarily closed areas).
- An evaluation of the patient populations served to identify patients who are immunocompromised.
- Monitoring protocols and acceptable ranges for control measures.
  Note: Hospitals should consider incorporating basic practices for water monitoring within their water management programs that include monitoring of water temperature, residual disinfectant, and pH. Additionally, protocols should include specificity around the parameters measured, locations where measurements are made, and appropriate corrective actions taken when parameters are out of range.

The Joint Commission

EC.02.05.02, EP 3
This element of performance went into effect January 1, 2022: The individual or team responsible for the water management program manages the following:

- Documenting results of all monitoring activities.
- Corrective actions and procedures to follow if a test result outside of acceptable limits is obtained, including when a probable or confirmed waterborne pathogen(s) indicates action is necessary.
- Documenting corrective actions taken when control limits are not maintained. **Note:** See EC.04.01.01, EP 1 for the process of monitoring, reporting, and investigating utility system issues

EC.02.05.02, EP 4
This element of performance went into effect January 1, 2022: The individual or team responsible for the water management program reviews the program annually and when the following occurs:

- Changes have been made to the water system that would add additional risk.
- New equipment or at-risk water system(s) has been added that could generate aerosols or be a potential source for Legionella. This includes the commissioning of a new wing or building.

Note 1: The Joint Commission and the Centers for Medicare & Medicaid Services (CMS) do not require culturing for Legionella or other waterborne pathogens. Testing protocols are at the discretion of the hospital unless required by law or regulation.

Note 2: Refer to ASHRAE Standard 188-2018 "Legionellosis: Risk Management for Building Water Systems" and the Centers for Disease Control and Prevention Toolkit "Developing a Water Management Program to Reduce Legionella Growth and Spread in Buildings" for additional guidance on creating a water management plan. For additional guidance, consult ANSI/ASHRAE Guideline 12-2020 "Managing the Risk of Legionellosis Associated with Building Water Systems." [7]

[7] R3 Report Issue 32: New Standard for Water Management Program https://www.jointcommission.org/standards/r3-report/r3.report-issue-32-new-standard-for-water-management-program/

ANSI/ASHRAE Standard 188-2021
Legionellosis: Risk Management for Building Water Systems

ASHRAE 188 is a standard developed by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) that outlines a risk management plan for Legionella bacteria and other waterborne pathogens in building water systems. Legionella bacteria can cause a serious respiratory infection called Legionnaires' disease, which can be fatal in some cases. The bacteria can grow and spread in water systems, including cooling towers, hot tubs, showers, and fountains. ASHRAE 188 provides guidance on how to minimize the risk of Legionella growth in building water systems.

The 2015 publication of ANSI/ASHRAE 188-2015, Legionellosis: Risk Management for Building Water Systems, fundamentally changed how Legionnaires' disease is handled in the United States. In 2017 the Centers for Medicare and Medicaid Services mandated that all hospitals and long-term care facilities implement a water management plan to reduce the risk of Legionnaires' disease, referencing ANSI/ASHRAE 188 as the basis for such plans. This fundamentally altered the standard of care for preventing diseases caused by Legionella and other waterborne pathogens in healthcare settings.

In August 2021, ASHRAE released an updated version of Standard 188: Legionellosis Risk Management for Building Water Systems. While most of the content remains the same, ASHRAE Standard 188-2021 now includes appendices that were released since its last update in 2018. One critical addition to the building water systems commissioning section of ASHRAE Standard 188 is that disinfection and flushing of potable water systems shall be completed no more than three weeks before whole or partial beneficial occupancy.

ANSI/ASHRAE Standard 188-2021

Legionellosis: Risk Management for Building Water Systems, an American National Standard, aims to minimize the potential for Legionnaires' disease to spread throughout building water systems. This standard provides minimum legionellosis risk management requirements for the design, construction, commissioning, operation, maintenance, repair, replacement, and expansion of new and existing buildings and their associated (potable and non-potable) water systems and components.

It applies to human-occupied commercial, institutional, multiunit residential, and industrial buildings. This standard does not include single-family residential buildings. Only where specifically noted in this standard shall certain building water systems or parts of building water systems be exempt. The standard is intended for use by owners and managers of human-occupied buildings, excluding single-family residential buildings. This standard is also intended for those involved in the design, construction, installation, commissioning, operation, maintenance, and service of centralized building water systems and components. Dual units of measurement. Read more at the ANSI Blog: ANSI/ASHRAE Standard 188-2021 for Legionnaires' Disease Risk Management.

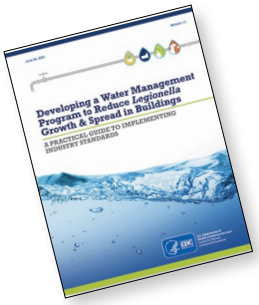
See Addendum to ANSI/ASHRAE Standard 188-201regarding minimum requirements when Legionella testing is chosen by the Program Team.

CDC Water Management Program

To protect vulnerable patient populations, the CDC published a guideline for preventing Legionella from growing in hospital water systems. Available since June 2017, the guideline provides a comprehensive set of standards called "Developing a Water Management Program to Reduce Legionella Growth and Spread in Buildings." The specifics of the guidelines include monitoring and prevention requirements for hazardous conditions in hospitals, nursing homes, or assisted-living facilities. Based on the ASHRAE Standard 188, these guidelines are an easy-to-understand interpretation of how to develop an effective Water Management Program for buildings.

Internal and external building factors can lead to increased growth of Legionella. These include variations in the quality of the municipal water supply, changes in water pressure throughout the facility, temperature fluctuations during distribution, and differences in the water's pH levels over time, creating ideal colonization conditions.

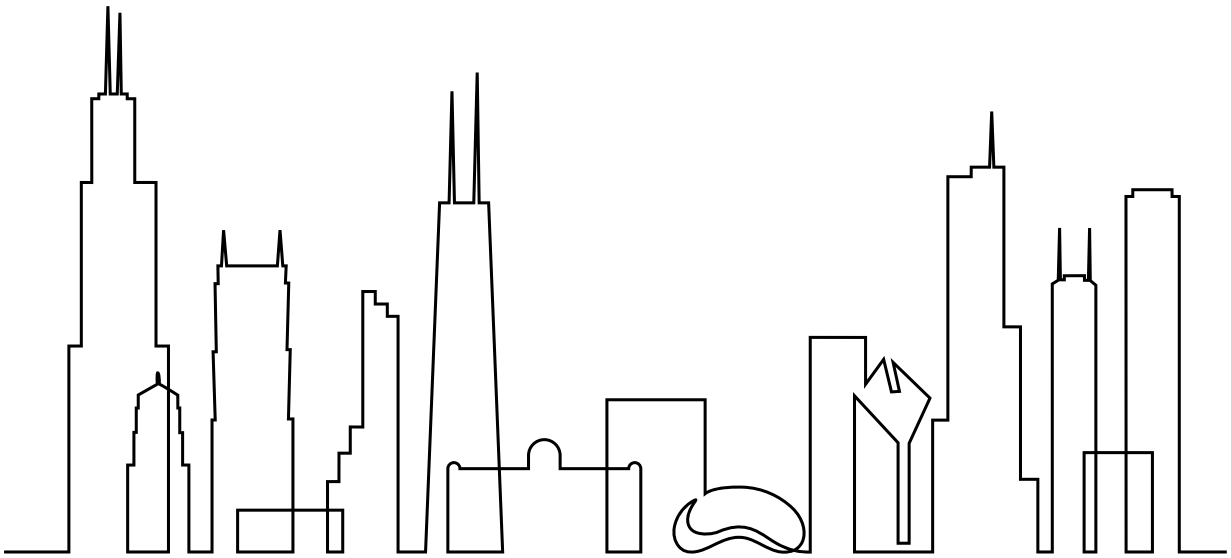
A water management program should consider all these factors to keep water sources safe for patients and staff. The key components of developing a successful water management plan include:



1. Establish a water management team for the facility.
2. Describe the water system completely using text specifications and process flow diagrams.
3 Identify monitoring points for water quality and establish the necessary control measures.
4. Review the efficacy of the plan and update it annually based on documented results.
5. Include contingency measures and response plans for any Legionella (or other types of) outbreaks.

The current control measures deployed in most hospitals use filtration, chemical dosing, and temperature technologies to reduce the number of pathogens and prevent exposure. Some of these techniques are more effective than others, and hospital administrators and facility owners need to find the right combination of treatment tactics to ensure that their water supply remains safe to use.

To obtain the CDC Water Management Toolkit visit: https://www.cdc.gov/legionella/downloads/toolkit.pdf



Post COVID-19

Underutilized Buildings Continue to be Challenged

As many buildings reopened after the COVID-19 pandemic, owners faced a new challenge in the form of water stagnation that occurred while their facilities were left uninhabited.

The continued preference of remote work is leaving high-capacity buildings under-occupied, and their water systems under-utilized, allowing the bacterial colonization to return post-remediation. COVID-19 taught many lessons to healthcare, schools, hotels and office building operators. Guidelines and resources are available from industry organizations.

Resources available

AIHA "Recovering from COVID-19 Building Closures" (PDF, 2020)

American Institute of Architects "Re-occupancy Assessment Tool"

American Water Works Association "Responding to Water Stagnation in Buildings with Reduced or No Water Use"

APPA.org Water Stagnation and Reopening Our Campuses After Covid-19

CDC Checklist for Infection Control Concerns When Reopening Healthcare Facilities Closed Due to Extensive Water and Wind Damage

CDC Reduce Risk from Water

CDC Reopening Buildings After Prolonged Shutdown or Reduced Operation

CDC ToolKit: Developing a Water Management Program to Reduce Legionella

IAMPO Considerations for Large Building Water Quality after Extended Stagnation

NIH Management of Legionella in Water Systems

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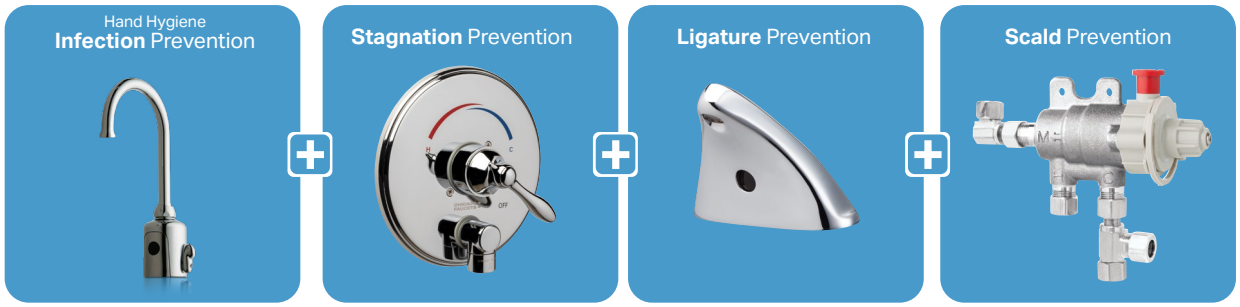
Chicago Faucets Engineers for Patient Safety

Chicago Faucets partners with facility managers, infection preventionists, nurses, specifying engineers, and architects to design and manufacture premium products that fit the requirements and challenges of care environments. The goal of patient safey is achieved through a portfolio of advanced faucets and showers that help to prevent infection and water stagnation. The company also offers devices for scald protection, eye safety, and antimicrobial plumbing replacement parts. Chicago Faucets +Healthcare is backed by a reputation of proven performance and reliability that exceeds demanding expectations in demanding environments.

Engineered for **Patient Safety**

CHICAGO FAUCETS + Healthcare



Fight Infection with Chicago Faucets +Healthcare Portfolio

Chicago Faucets supports the healthcare facility's goal of reducing infections and complying with Water Management Plan requirements by providing plumbing fittings uniquely engineered for patient safety. The +Healthcare portfolio includes HyTronic® for Patient Care Series of Touchless Faucets, the Auto-Drain™ Shower System for infection prevention, the ELR Series of Ligature Resistant Touchless Faucets, and the SLR Shower Series for liga-ture prevention. In addition, it includes assorted thermostatic valves for scald prevention, space saving Combination Emergency Eyewash and Faucets Series for injury prevention, antimicrobial handles for manual faucets, and non-aerating antimicrobial laminar flow out-lets for infection prevention.

Chicago Faucets continues to be at the leading edge of technology for the healthcare industry. Where there are patients, Chicago Faucets provides plumbing products that enhance safety and limit infection.

For decades the company has been working with medical facilities to reduce infection due to waterborne pathogens. Today, the leading faucet manufacturer for healthcare institutions understands the pressures that drive the industry from being highly regulated and compliance driven to tight operating margins and labor shortages. Chicago Faucets has developed an entire portfolio of products for patient safety.

HyTronic® Patient Care Touchless Faucets

HyTronic was the first touchless faucet engineered to meet the demands of healthcare environments for a responsive, touch-free handwashing experience. The HyTronic for Patient Care Series took it to another level. These faucets are specifically designed for patient care applications because they limit the tested microbial contamination to a level statistically similar to a conventional manual faucet and offer quicker response times, reducing the need to wait for sensor-activated faucets. These modified sensor type faucets were tested and validated in a third-party study (see below). HyTronic for Patient Care increase operational efficiency and include built-in maintenance features to reduce costs associated with testing and remediation.

**Third Party Study to Test Waterborne Pathogens in Electronic Faucets*

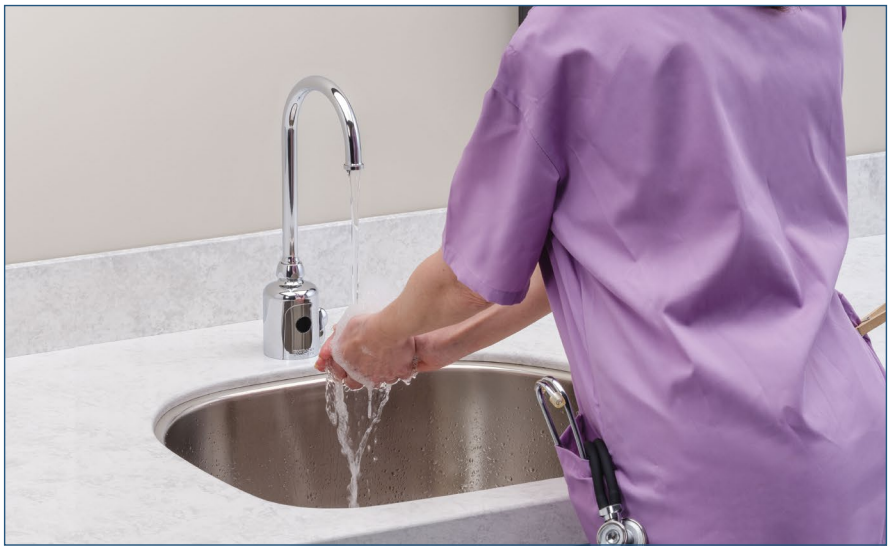
The HyTronic® for Patient Care was tested and validated by a nationally recognized testing laboratory. To validate Chicago Faucets' design assumptions regarding the waterway design, HyTronic for Patient Care faucets were extensively tested and monitored for both heterotrophic plate count (HPC) and Legionella bacteria.

Chicago Faucets utilized the test facilities at the University of Pittsburgh with culture and sample analysis performed by Special Pathogens Laboratory (SPL). SPL is a nationally recognized analytical microbiology laboratory specializing in detecting, controlling, and remediating waterborne pathogens like Legionella.

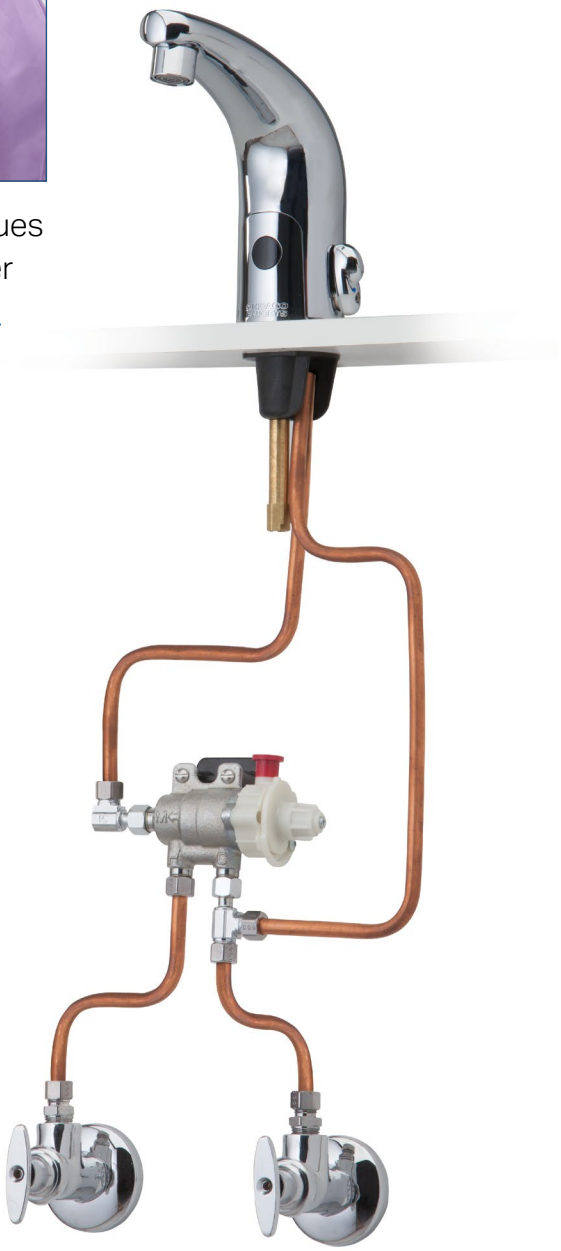
The study was performed to see if electronic faucets are statistically different from standard mechanical faucets in promoting Legionella growth and if there is any difference between these two faucet types in terms of the efficacy of standard disinfection practice. Statistical analysis of experimental results obtained during the pre.chlorination phase revealed that there is no significant difference in the ability of sensor faucets to promote Legionella colonization when compared to a standard mechanical faucet. Sensor faucets did harbor higher concentrations of HPC compared to mechanical faucets. The findings demonstrated that some faucets fostered higher microbial concentrations during regular usage. Conversely, modified sensor faucet types demonstrated the lowest microbial concentrations among sensor faucets.

HyTronic® Patient Care Touchless Faucets

Designed with Hygiene in Mind



The battle against bacteria within healthcare facilities continues today and that is why Chicago Faucets continues to engineer improvements to the original HyTronic® and HyTronic Patient Care series of faucets.



Features that are included in the HyTronic for Patient Care faucet support the facilities' drive to meet operational efficiency and reduce extraneous costs. This advanced faucet incorporates benefits to assure patients and health care professionals that infection prevention measures are maximized at their facility:

- Hygiene flush mode provides automatic conditions-based flushing to reduce stagnation and ensure complete distribution of chemical treatment.
- Antimicrobial silver ion laminar flow outlet on select fittings limits waterway bacterial growth
- Copper tube inlets reduce bacterial growth
- Angle stops with integral checks prevent cross flow
- HyTronic offers one of the best infrared sensors in the industry; it is trusted by healthcare professionals. Dual beam detection is designed to be switchable to overcome environmental obstacles.

HyTronic® Patient Care Touchless Faucets

Bluetooth® Enabled Monitoring

The latest generation of HyTronic faucets includes Bluetooth® communication for use with the app. With CF Connect, healthcare centers can proactively manage the health of the water system and provide a documented audit trail, all while saving time and money. The CF Connect app makes it easy to configure the faucet with a smartphone or tablet. The CF Connect app offers facilities managers simple and intuitive operation and configuration of the faucet.

The automation of previously manual tasks is now possible through the CF Connect app which augments the features of the original HyTronic Patient Care line to include:

- Management of devices by room, recording of use data, activating cleaning and flushing mode in a secure format to simplify maintenance and documentation.
- Flushing mode keeps stagnant water out and limits infections. This can be automated and includes use-based, interval-based, and volume-based flushing. Pipe flushing can also be done for longer periods.
- Selection of beam settings and detection range are possible with the CF Connect app.

HyTronic Options for the Utmost in Infection Prevention

HyTronic Patient Care Faucets can be ordered with ASSE 1070 certified thermostatic mixing valve and high temperature angle stop. They are available with gooseneck or traditional spouts. Power options include DC, AC, AC with, emergency back-up, or long-term lithium battery power. Existing HyTronic faucets can also be updated with a Bluetooth® enabled sensor, to leverage the CF Connect app and all the benefits it offers. HyTronic faucets are American made, meet ADA requirements, EPA WaterSense certified, durable and available on our CF*Now*! quick ship program.

TempShield® ASSE 1070 Certified

EBPS Emergency Backup Power System

LTPS Long Term Power System

Auto-Drain™ Shower System for the Removal of Stagnant Water

As any stagnant water presents a risk to healthcare facilities and their patients, systems engineers and designers are always looking for ways to remove stagnant water from the plumbing system whenever possible. The Auto-Drain Shower System from Chicago Faucets is a first-of-its-kind solution that automatically removes standing water from the column between the valve and the showerhead. The Chicago Faucets automatic drain system is designed to help reduce stagnant water in the valve, pipes, and hoses of the shower system. Drains integrated into the valve and hand spray hose remove water from the system after each use. The key components of the Auto-Drain system include: Thermostatic Pressure-Balancing Shower Valve, Hose, and Hand Spray.

Auto-Drain Thermostatic Pressure-Balancing Shower Valve

The Chicago Faucet's Auto-Drain Shower System comes with a thermostatic pressure-balancing valve that removes water from the system in less than one minute. It provides protection from scalding and thermal shocks by monitoring both water temperature and pressure.

Auto-Drain Shower Valve Drain

When the shower is shut off, water drains automatically from the valve in less than a minute. Available as a separate drain to locate close to the ground or integrated with the thermostatic pressure balancing valve.

Auto-Drain Hose and Hand Spray

After each use, water is drained automatically from the hand spray and hose eliminating the frequent practice of draping the hose where it could touch the floor and risk further contamination. The Auto-Drain Hose and Hand Spray is also available as a retrofit kit for existing showers.

Choice of Shower Valve Trim Options

The Auto-Drain Shower System includes a choice of three shower valve trim designs and an integrated or separate drain valve.

Round with integrated valve drain

Round with separate valve drain

Square with separate valve drain

The Auto-Drain Shower System can be customized to your facility's application. It is easy to specify and order multiple versions of the system to meet the needs of assisted or independent showers.

In addition to the valve, drain, and hand spray, Chicago Faucets offers stainless steel slide bars and ADA grab bar options for additional safety or convenience. Auto-Drain can be ordered for new or retrofit showers.

For complete specifications, download the brochure or visit www.chicagofaucets.com/autodrain.

To find out more about the variety of options available for your facility, contact Chicago Faucets. Contact your **area representative** to discuss your exact requirements today. Find your area Chicago Faucets **distributor** here.

CHICAGO FAUCETS Healthcare

Engineered for **Patient Safety**

Infection Prevention • Stagnation Prevention • Ligature Prevention • Scald Prevention

Chicago Faucets understands that patient safety is paramount and the selecton of the appropriate plumbing equipment for hospitals, long term care, and behavioral centers is crucial. With a variety of fittings suited for infection prevention, stagnation prevention, ligature prevention, scald prevention, and safety, we enable engineers and designers to improve water safety throughout the entire facility. From touchless faucets for all applications to drinking fountain fittings and ergonomically designed tub and shower fittings, Chicago Faucets deliver the highest quality products that work safely and reliably to keep staff and patients safe.

CF NOW!™

BUY AMERICAN ACT COMPLIANT™

EPA WaterSense PARTNER

CHICAGO FAUCETS
Geberit Group

Chicago Faucets, a member of the Geberit Group, is the leading brand of commercial faucets and fittings in the United States, offering a complete range of products for schools, laboratories, hospitals, office buildings, food service, airports, and sports facilities. Whatever your requirements may be, Chicago Faucets offers standard and made-to-order products that are designed to meet any commercial application.

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