

Quick Guide, Chapter 5: Water-Related Environmental Infection Control

Expanded information, case studies, references and other important items related to water-related environmental infection control are available in Chapter 5 of this publication.

Plumbing in a health care facility can house pathogens. Taking steps to minimize pathogen growth is important. Pseudomonas grow in stagnant water found within the plumbing system, such as in joints, dead legs, encrustations and plumbing enhancements. The pathogens are closely associated with biofilms, which provide protection and food, and they are typically dispersed when biofilm reaches certain development phase or during sloughing events such as when the water system is disrupted, such as during construction or during high-demand periods.

Since completely eliminating these pathogens is unlikely even in new construction, it is important to develop a water safety or management program that iteratively monitors water at predetermined locations and addresses out of range control metrics when noted.

A multidisciplinary water management team should be developed in all health care facilities. This team, which should be given the authority to implement water decisions, has a number of important tasks. These include mapping the water system; analyzing hazards; developing mitigation strategies; establishing metrics; enacting policies that identify hazards; conducting surveillance for disease caused by waterborne pathogens; and developing a strategy for replacement of current higher-risk premise plumbing problem areas. Each team member has specific areas of responsibility.

A risk assessment is an important step in water system management. The risk assessment should identify potential problems with the domestic the water source, inlets, flow, stagnation, heat transference, faucets/showers/drains and other areas. Another important part of the risk assessment is to develop a plan to deal with water disruptions, both planned and unplanned, since such disruptions can lead to the dispersal of pathogens.

Regular monitoring of water disinfection strategies by the water source is key to understanding incoming water risks. Water quality reports should be routinely reviewed, and, if utilized, supplemental disinfection methods adjusted accordingly. Adjunct disinfection strategies for health care facilities to consider include hypochlorite, chlorine, chlorine dioxide, copper-silver ionization, hyper-chlorination filtration, ultraviolet light and thermal control. All have advantages and disadvantages.

Best practices regarding waterborne pathogen management include:

- Create and empower a multidisciplinary water management team. Among other purposes, this team socializes the concept of a water safety program.
- Perform a risk assessment for all water systems and water-containing equipment. Include water within equipment, stagnant water plumbing during construction, and rarely used locations, such as eye-wash stations and emergency showers.
- Be involved in renovation and construction to provide safe plumbing expertise.
- Avoid in-hospital decorative water features (water walls, reflecting pools, fountains).
- Be aware of waterborne pathogens and the diseases they may potentially cause, and maintain surveillance for trends. Some of these diseases include pneumonia, bloodstream infections, surgical site infections, meningitis, gastroenteritis and urinary tract infections.

- Develop and execute an action plan to mitigate risks and address outbreaks when they occur.
- Monitor key metrics established by the water safety team to demonstrate that the water safety program is working. Key metrics may include 1) process control measures, such as chlorine levels or measurements of temperature control, 2) the burden of pathogens in humans (patients and health care professionals) and/or 3) the burden of pathogens in water as epidemiologically indicated.