HAI-Lights Newsletter

An infection prevention and control resource

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The Spring 2024 HAI-Lights newsletter discussed environment of care in regard to air. Quiz yourself on the topic below and learn the answer on page four (4).

When working correctly, what direction does air move in a negative pressure room?

a) From the room to the hallway

b) From the hallway to the room

c) Air does not move in either direction

In This Issue:

Environmental Infection Control

Environmental infection prevention involves cleaning and disinfecting the environment of care which includes the surfaces, water, and air that a patient interacts with in a healthcare setting. Environmental infection prevention practices help ensure healthcare environments meet the appropriate standards for patient safety. Environmental services, air, and water are among the many aspects that must be maintained and monitored in healthcare settings.[i]

The two previous HAI-Lights editions covered the topics of environmental services and air. This edition will cover water and will conclude the three-part environmental control series.

Water

Water is used throughout healthcare settings in ways such as washing hands, for operating specific medical equipment (e.g., ventilators, humidifiers), ice, water baths, and more. Pathogens such as *Legionella spp., Pseudomonas aeruginosa,* and *Burkholderia cepacia* can be transmitted through drinking water. When contaminated water is used in a healthcare setting, it can cause healthcare-associated waterborne illnesses in immunocompromised and immunosuppressed patients.

It is crucial that all healthcare settings have a water management program to ensure water quality standards are being met and precautions are in place to prevent the spread of contaminated water.

Basics of Water

A few water-related definitions will be reviewed before continuing to discuss water in healthcare settings:

- Potable water, otherwise known as drinking water, is a term often used when discussing water.
- Hydrotherapy is used for treating patients with conditions such as burns, arthritis, and other medical conditions. Hydrotherapy involves equipment including pools, hot tubs, and whirlpools.[ii]

Dialysis

Water used in dialysis settings must undergo specific treatment and follow standards set by the Association for the Advancement of Medical Instrumentation (AAMI) to be used for hemodialysis, a treatment for advanced kidney failure that involves a machine filtering wastes, salts, and fluid from the blood. A patient comes in contact with 200-600 liters of water a week during hemodialysis.[iii] Without proper water treatment, microbial contamination may occur, meaning organisms are present in water that can pose a threat to a patient's health. Microbiological and endotoxin testing should be conducted to ensure water does not exceed acceptable limits and is not contaminated. Most facilities use reverse osmosis, a process that filters water to remove impurities, as a primary method for purifying water.

Hydrotherapy

Hydrotherapy is used for various reasons in healthcare settings. Burns are one example of a medical condition that uses hydrotherapy as part of the treatment plan. Burn patients are at high-risk of developing a healthcare-associated infection (HAI) due to a compromised skin barrier and the nature of their wounds. Different pathogens can be associated with hydrotherapy through direct contact, ingestion, or aerosols.[ii] It is crucial for water and hydrotherapy equipment to be cleaned, disinfected, and maintained to prevent possible contamination.

Special Pathogens

Legionella

Legionella pneumophila causes 90% of Legionellosis infections, the rest is attributed to other *Legionella spp*.[ii] Legionellosis is a term to describe an infection produced by *Legionella spp*, while Legionnaires Disease is an illness with severe pneumonia. *Legionella* is contracted through inhalation of water aerosols. Symptoms normally present 2 to 14 days after exposure.[iv] *Legionella spp*. can be acquired through water systems used in healthcare settings such as cooling towers, showers, and other water

distribution systems. Water maintenance, surveillance, treatment, and disinfection are essential to ensure *Legionella spp.* growth and contamination are minimized.

To reduce the risk of *Legionella*, healthcare facilities should utilize a water management program that includes components such as, but not limited to, a multidisciplinary team consisting of employees and partners to manage the program, control measures, corrective actions, and building specific water systems.[v]

Access the CDC's toolkit for developing a water management plan by visiting: [Legionella Toolkit-Version 1.1-June 24, 2021 (cdc.gov).]

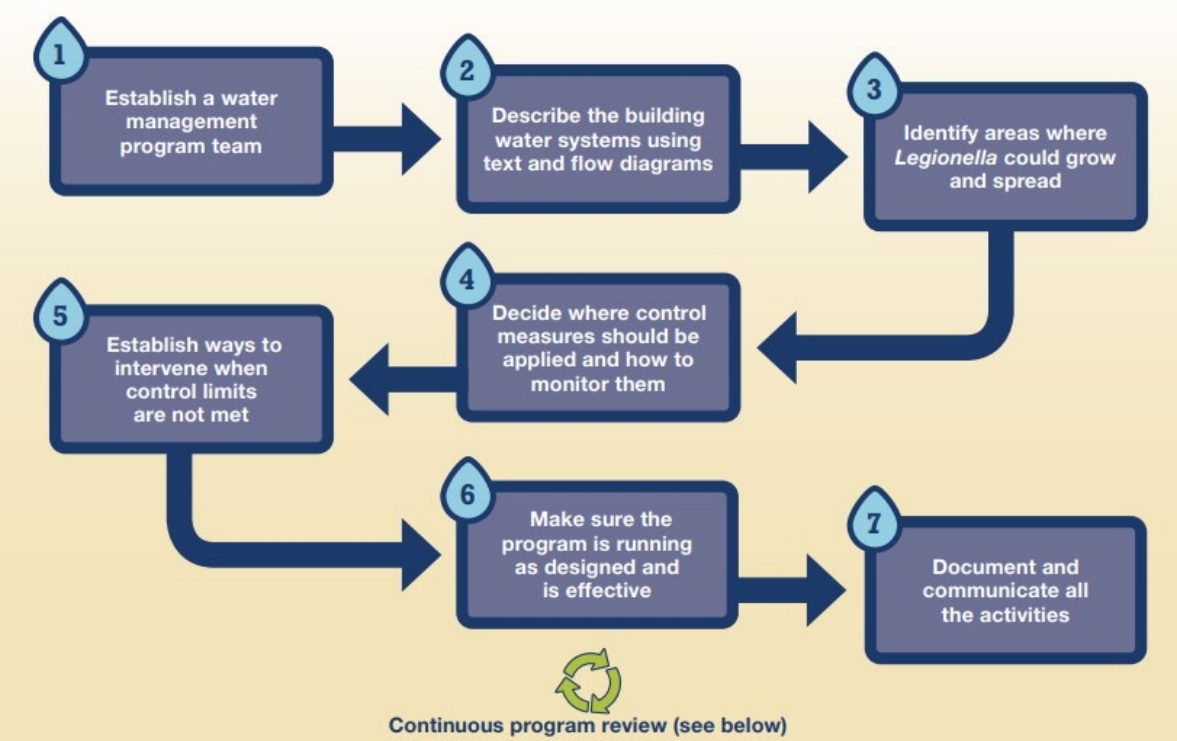

Figure 2. Depiction of the elements of a water management program.[v]

Pseudomonas aeruginosa

Pseudomonas aeruginosa is a common gram-negative organism that can be transmitted through contact with water. *P. aeruginosa* can be found in different environmental sources such as potable water, distilled water, hydrotherapy pools, and other water sources. It can tolerate a wide temperature range and can grow in distilled water, which makes it a prevalent healthcare-associated pathogen. Patients at greater risk of becoming sick from *P. aeruginosa* include, but are not limited to, patients in the ICU, in burn therapy, receiving dialysis, and patients with underlying medical conditions. Following the correct environmental prevention and control practices for different water sources is essential to prevent transmission of *P. aeruginosa* and other waterborne pathogens.[ii]

Antimicrobial Stewardship

Antimicrobial stewardship (AS) is the effort to track and improve how antibiotics and other antimicrobial medicines are prescribed by clinicians and used by patients. For safe water management, AS involves regular testing and maintenance of treatment systems, cautious use of antimicrobials, staff education, and regular protocol reviews. To learn more about AS and what the Healthcare Safety Unit (HSU) AS team is working on, please contact: antibioticstewardship@dshs.texas.gov.

Mark the calendar! From November 18 - 22, 2024, the HSU invites all to participate in U.S. Antibiotic Awareness Week (USAAW) and help share the Be Antibiotics Aware message with partners, colleagues, and friends.

CDC Project Firstline

When healthcare workers practice infection control consistently–every person, every action, every day–lives are saved. The HSU joins Project Firstline (PFL) in Texas, a CDC-led infection control training collaborative for U.S. healthcare workers. Explore PFL and share these resources with your networks:

- Micro-Learn Training Resources
- Ventilation in Healthcare Settings
- Recognizing Risks in Health Care
- Learn Where Germs Live in Health Care
- For more information, visit: cdc.gov/projectfirstline

PROJECT FIRSTLINE
CDC's National Training Collaborative for Healthcare Infection Prevention & Control

Healthcare Safety Unit

- The HSU at the Department of State Health Services (DSHS) was established to promote safe and quality healthcare through awareness, education, transparency, monitoring, and response, helping to improve the well-being of all Texans.
- The HSU comprises of three groups: HAI Investigations Group, Data and Training Group, and Multidrug-Resistant Organism (MDRO)/Antimicrobial Resistance (AR) Group.
- Learn more about the HSU by visiting: dshs.texas.gov/healthcare-safety-unit.

Additional Resources

Subscribe to the HAI-Lights Newsletter and provide your feedback to help us improve.

- cdc.gov/infectioncontrol/index.html
- apic.org/
- shea-online.org/
- tsicp.org/

HAI-Lights Refresher Answer: B) From the hallway to the room
When ventilation in a negative pressure room works properly, air will move from the hallway to the room. Negative pressure airflow is used for Airborne Infection Isolation Rooms (AIIR) with airflow moving into the room to prevent the spread of highly contagious diseases spread via the airborne route.

References

I. CDC (2003). Guidelines for Environmental Infection Control in Health-Care Facilities. Centers for Disease Control and Prevention. Guidelines for Environmental Infection Control in Health-Care Facilities (cdc.gov)
II. CDC. (2003). D. Water. Centers for Disease Control and Prevention. D. Water | Infection Control | CDC
III. CDC. (2024). Water Use in Dialysis. Centers for Disease Control and Prevention. Water Use in Dialysis | Dialysis Safety | CDC
IV. CDC. (2024). About Legionnaires' Disease. Centers for Disease Control and Prevention. About Legionnaires' Disease | Legionella | CDC
V. CDC (2021). Developing a Water Management Program to Reduce *Legionella* Growth & Spread in Buildings. Legionella Toolkit-Version 1.1-June 24, 2021 (cdc.gov)