

24 UPC Code Ammendment

Mechanical and Plumbing Board meeting, June 27, 0930

Permitting Development Center

APH Epidemiology and Disease Surveillance presentation



Goal: Improving timing of flushing prior to occupancy

Legionella prevention

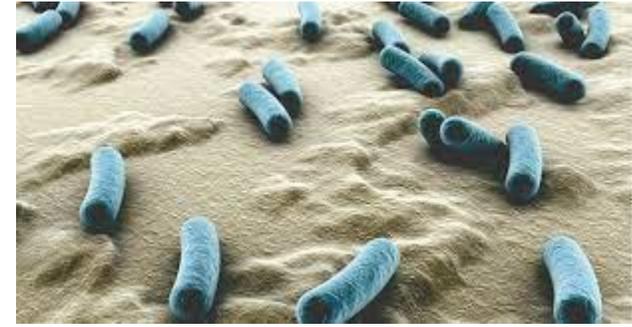


Legionella Overview

- *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 centralized air cooling systems for buildings or industrial processes)
 - Hot tubs
 - Decorative fountains and water features
 - Hot water tanks and heaters
 - Large, complex plumbing systems
- About 1 in 3 cases (35%) are due to changes in water quality from reasons external to the building itself



Legionella in biofilm...



- Biofilm is often associated with *Legionella* in plumbing systems. Biofilm is a slimy coating that is formed as microbes attach to underwater surfaces (e.g., the inside of a pipe). Biofilm can form in valves, fittings, and on pipe walls, feeding *Legionella*.
- *Legionella* overgrowth can also be caused by plumbing system replacement and repairs, water temperatures between 68°-122°F, water pressure drops, boil water notices, water main breaks, water stagnation, and increased sediment



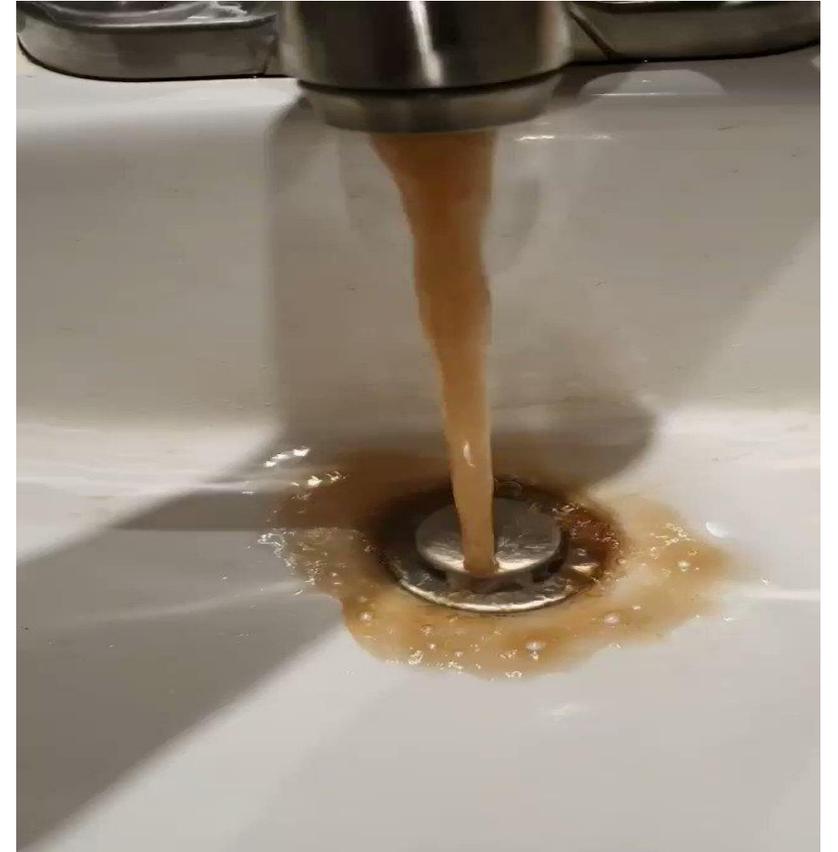
Legionella Symptoms (you have to breathe it in)

- Symptoms can include:
- Cough
- Shortness of breath
- Fever
- Muscle aches
- Headaches
- Legionnaires' disease can also be associated with other symptoms such as diarrhea, nausea, and confusion. Symptoms usually begin 2 to 14 days after being exposed to the bacteria, but it can take longer
- Legionnaires' disease is deadly for about 10% of people who get it.



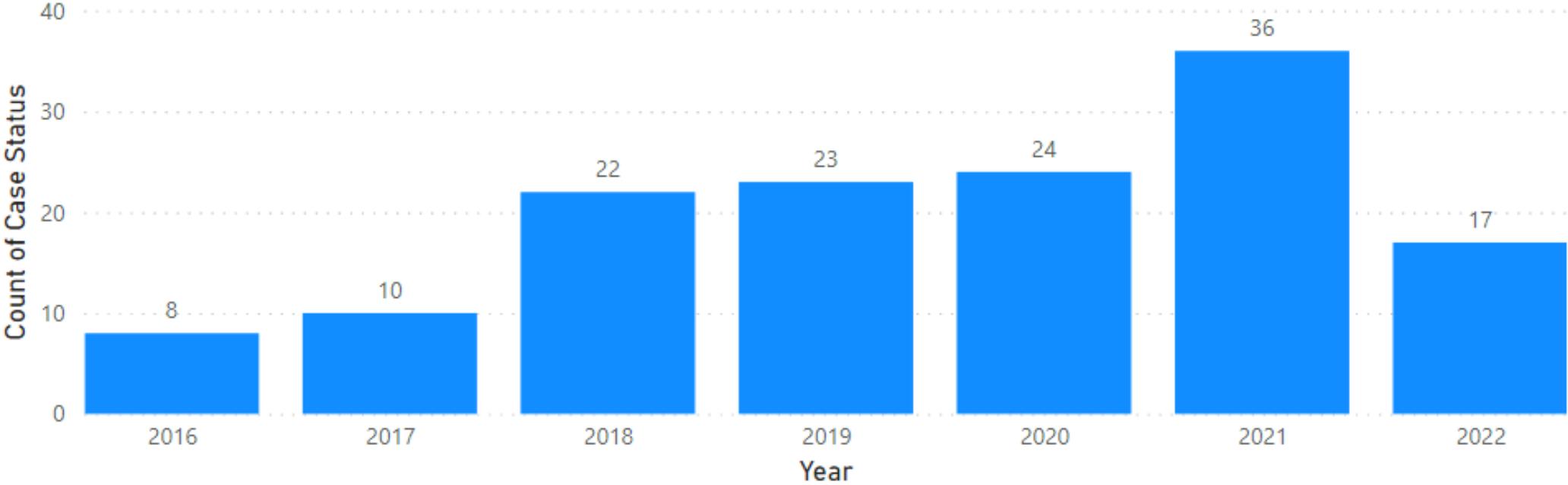
Issue: Water stagnation leads to Legionella overgrowth

- Recently a healthcare facility had brown water when connected early April.
- “Prior to use” flush done >4 months ago
- Water service lines installed last June 2022
- Common issue in new hospital construction especially when water does not get turned on in timely manner and no timed flushing protocols in place
- Corrosion of pipes leads to biofilm growth
- Many Legionella outbreaks in hospitals are related to new construction
- What is current Austin standard?
- Can we improve?



Travis County Case Counts

Cases Per Year



Uniform Plumbing Code- no timing for flushing

<https://www.iapmo.org/publications/read-uniform-codes-online/>

609.10 Disinfection of Potable Water System

New or repaired potable water systems shall be disinfected **prior to use** where required by the Authority Having Jurisdiction. The method to be followed shall be that prescribed by the Health Authority or, in case no method is prescribed by it, the following:

- 1) The pipe system shall be flushed with clean potable water until water appears at points of outlet
- 2) The system or parts thereof shall be filled with a water-chlorine solution containing not less than 50 parts per million of chlorine, and the system or part thereof shall be filled with a water-chlorine solution containing not less than 200 parts per million of chlorine and allowed to stand for 3 hours
- 3) Following the allowed standing time, the system shall be flushed with clean potable water until the chlorine residual in the water coming from the system does not exceed the chlorine residual in the flushing water
- 4) The procedure shall be repeated where it is shown by a bacteriological examination made by an approved agency that contamination persists in the system



ASHRAE

- The American Society of Heating, Refrigerating and Air-Conditioning Engineers is an American professional association seeking to advance heating, ventilation, air conditioning and refrigeration systems design and construction
- ASHRAE standards and guidelines include uniform methods of testing for rating purposes, describe recommended practices in designing and installing equipment and provide other information to guide the industry.



ASHRAE 188

- In 2015, ASHRAE developed a new Standard aimed at preventing the growth and spread of Legionella. Created as a voluntary consensus Standard, ASHRAE 188 provides guidance that does not have regulatory authority unless it is incorporated into local building codes, and was developed by a committee comprised of academic, industry, and government (CDC) subject matter experts. By creating a framework for proactively managing building water systems and reducing the potential for Legionella growth in these systems, following this Standard can help building and facility managers prevent many but not all cases of legionellosis.

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ASHRAE 188- intended audience

- The intended audience of ASHRAE 188 includes people who maintain and manage building water systems, including systems for potable (water used for drinking and showering), non-potable, and recreational water. This includes building owners and managers, as well as people who operate, maintain, and repair existing buildings, and people involved in the design, construction, and commissioning of new buildings. The Standard may also be used by health departments or other governmental or regulatory entities to make recommendations about prevention of Legionnaires' disease or in the writing and enforcing of local codes. ASHRAE 188 is not a Standard for single-family or small multi-family residential buildings.



ASHARE 188 8.4 excerpt

8.4 Commissioning. Instructions for commissioning of all *building water systems* shall be provided to the building owner or *designee*. Commissioning shall include the following:

- a. Procedures for flushing and *disinfection*
 1. Procedures shall comply with all applicable national, regional, and local regulations.
 2. *Disinfection* and flushing shall be completed no more than three weeks before whole or partial *beneficial occupancy*.
 - i. If *beneficial occupancy* of any part of the building is delayed more than two weeks but less than four weeks after *disinfection*, flushing of all fixtures shall again be completed.
 - ii. If *beneficial occupancy* of any part of the building is delayed four weeks or more after *disinfection*, the need for *disinfection*, flushing, or both *disinfection* and flushing of unoccupied areas shall be determined by the *Program Team*.
- b. Confirmation that *building water system* performance meets design performance parameters documented in Sections 8.2.1 and 8.3



APH Proposal- describes timing

- Recommend to adopt ASHRAE 188, 8.4 which describes timing of disinfection and flushing prior to use
- “...Disinfection and flushing shall be completed no more than ~~three~~ two weeks before whole or partial beneficiary occupancy
 - If beneficial occupancy of any part of the building is delayed more than two weeks but less than four weeks after *disinfection*, flushing of all fixtures shall again be completed.
 - If beneficial occupancy of any part of the building is delayed four weeks or more after disinfection, ~~the need for disinfection, flushing, or both disinfection and flushing of unoccupied areas shall be determined by the Program Team”~~

We will change to...

“If beneficial occupancy of any part of the building is delayed four weeks or more after disinfection, flushing and disinfection of all fixtures shall again be completed.”



Putting it in a table:

| Disinfect and Flush (D&F) | Time before occupancy | Action |
|--------------------------------------|--|---|
| D&F shall be completed... | =/< 2 weeks | None |
| If occupancy delayed... | >2 wks but < 4 weeks after disinfection | Reflush |
| If occupancy delayed... | >4 weeks after disinfection | Flush and disinfect all fixtures again |

Flushing and Disinfection

- The initial flushing is to remove all of the by-products and junk from construction. Flushing is part of a disinfection (that's how you get the chlorine out) but the initial flushing is important so you're starting with a relatively clean system.
- First you flush
- Then you disinfect which is done in a flush
- You may need to reflush
- If too much time passes, you will need to reflush AND disinfect

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Thank you
Questions?

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