Practical Experiences Operating a Hospital as a *Regulated* Public Water System

Jeff Swertfeger  
Superintendent  
Water Quality Management Division  
Greater Cincinnati Water Works

Deborah H. Metz, Mariano Haensel*
Premise Plumbing

- Water safe as it leaves plant
- Water safe as it travels through system
- SDWA stops at premise
- Building owner’s responsibility starts
Premise Plumbing

- Long stagnant time
- Low chlorine residuals
- Warm water (80F-110F).
- “Green” modifications
- Reservoirs (water heater, shower hose, etc)
Legionella

- Naturally occurring bacteria
- *L. pneumophila* – Legionaire’s disease
- Inhalation, not drinking
- Up to 18,000 pneumonia cases per year
- 20% total mortality
- About 70% of hospital systems test positive
VA under scrutiny after Legionnaires' cases in Pittsburgh

By Nelli Black and Drew Griffin, CNN
updated 6:23 PM EST, Fri December 14, 2012

Legionnaires’ outbreak linked to water
The hot water system sickened 11 patients at Miami Valley Hospital.

By Ben Sutherly
Staff Writer

DAYTON — The infected location of the hot water system at Miami Valley Hospital's new 12-story addition...
Guidelines

- CDC and ASHE have guidelines
- Heat treatment, flushing to 130F
- Eliminate stagnant zones
- Chloramines, free chlorine, chlorine dioxide, silver/copper
Case Study: Cincinnati Hospital

- Very renowned local hospital concerned
- Chose silver/copper treatment
- Contacted Ohio EPA
- Must have a Licensed Operator
- Approached GCWW
Amps = Flow of electrons
Volts = force required to maintain amps
Why Silver/Copper?

- Effective
- No reagents, moving parts, complex monitors
- Little/no DBPs
- No primary MCLs
- Easy system
(A) “Public water system” means a system for the provision to the public of water for human consumption through pipes or other constructed conveyances if the system has at least fifteen service connections or regularly serves at least twenty-five individuals. “Public water system” includes any collection, treatment, storage, and distribution facilities under control of the operator of the system and used primarily in connection with the system, any collection or pretreatment storage facilities not under such control that are used primarily in connection with the system, and any water supply system serving an agricultural labor camp as defined in section 3733.41 of the Revised Code.
6109.02 Public water system exemptions.
Chapter 6109. of the Revised Code does not apply to a public water system which meets all the following conditions:
(A) Consists only of distribution and storage facilities and does not have any collection and treatment facilities;
(B) Obtains all of its water from, but is not owned or operated by, a public water system;
(C) Does not sell water to any person;
(D) Is not a carrier which conveys passengers in interstate commerce.
How to Regulate?
Hospital Location
<table>
<thead>
<tr>
<th></th>
<th>GCWW</th>
<th>Hospital</th>
<th>% of Service Represented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>824,000</td>
<td>3,500</td>
<td>0.4%</td>
</tr>
<tr>
<td>Flow</td>
<td>132 MG</td>
<td>0.75 MG</td>
<td>0.6%</td>
</tr>
<tr>
<td>Surface area</td>
<td>812 mi²</td>
<td>0.00528 mi²</td>
<td>0.00065%</td>
</tr>
<tr>
<td>Connections</td>
<td>240,000</td>
<td>6</td>
<td>0.0025%</td>
</tr>
</tbody>
</table>
Type of System

- Community vs non-community
  - >15 service connections
  - >25 year round residents

- Transient vs non-transient
  - >25 of same people for at least 6 months

Non-Transient Non-Community
Population

- A and B Buildings only
- Non-transient – doctors, nurses, staff, volunteers - 800
- Transient – inpatients, outpatients, ER, visitors – 260,610
- Non-transient + Transient/365 = 1514
Class 1 System

- Must have an Operator of Record
- 3 days per week
- 1.5 hours per week
- No reduced staffing
- Staff cannot get a Class 1
Applicable Regs

- No DBPs (under GCWW umbrella)
- Total Coliform Rule (under GCWW umbrella)
- Lead and Copper (under GCWW umbrella)
- No CCR (not for NTNC)
Plan Review

- Approving what?
- Standards?
- NSF approval?
- “Do no harm”
- Set operating and monitoring criteria
OEPA Operating Criteria

- Copper daily by hand-held unit
- Copper 1/wk by ICP
- Silver 1/mo. Stop after 1 year if <SMCL
- MOR – Flow and hand-held copper
- SSR – ICP silver and copper
Manufacturer’s Recommendations

- Silver and Copper 4 times per week
- Hot and Cold water
- Copper 200-300
- Silver 20-40
- Clean monthly
Sampling Locations
Sample locations
GCWW Level of Effort

- Negotiated contract
  - Liability
  - Costs
- Started February 2014
- 1.5 – 2 hours per day – 3 days per week
- GCWW samples and lab
Future for GCWW

- Work with hospital to protect patients
- Work with manufacturer to fine-tune
- Work with USEPA to evaluate treatment
- Work with OEPA on implementation
Future for Ohio

- Lots of hospitals have treatment
- Lots of hospitals in Ohio
- OEPA will regulate
- More difficult decisions
Three Systems?
Thank you

jeff.swertfeger@cincinnati-oh.gov
(513) 624-5608