

Legionella & Drinking Water Systems

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What We Used to Think About *Legionella* & Drinking Water

- It's really only found in cooling towers
- It's VERY RARELY found in mists from features like hot tubs & spas

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Regulatory Approach to *Legionella*

- *Legionella* is an Opportunistic Pathogen
 - No drinking water standard (level) specified by either regulation or health advisory
 - No monitoring required for drinking water systems

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Legionella Is “Winning”

- We’re tracking more cases of *Legionella*
- *Legionella* control poses new challenges



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MythBusters strike again: *Legionella* is everywhere!

- Published studies find 20-70% of buildings colonized with *Legionella*
- *Legionella* colonization is typically associated with:
 - Hot water temperatures < 122° F
 - Interruptions in water service
 - Large buildings with extensive distribution piping



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Where Has *Legionella* Been Found?

- Hospitals
- Geriatric centers
- Hotels
- Casinos
- Single family residences ←

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Results of NJ DOH Study of Outbreak

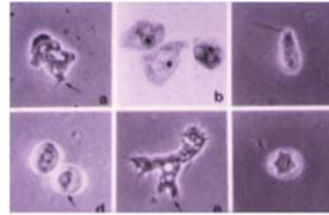
**Investigation implicates poorly maintained
storage tank and surrounding distribution
system**

- Low flow conditions, flow interruptions
- Low or no chlorine residual
- Little mixing in water storage tank
- No regular flushing of water mains

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Part of Larger Issue with Distribution System Regrowth Problems

- Conditions in distribution systems can lead to biofilm (organism) regrowth on pipe walls
- Protozoans grazing on bacteria in biofilms or pipe sediments can serve as hosts for *Legionella*



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Solution: “All You Have To Do Is:”

- Produce a biologically stable water.
- Use only non-reactive piping materials.
- Maintain a good disinfectant level through the whole distribution system.
- Prevent stagnation, high water age, sediment accumulation, “warm water conditions”.
- Eliminate intrusion by non-treated water.

This includes inside all buildings served by the water system (note: every building is a “dead end” situation).

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Certain Facilities Take Response Into Their Own Hands

- Which types of facilities?
 - Hospitals, VA Facilities, Casinos, Hotels
- What response?
 - “Semi-routine” Thermal shock
 - “Semi-routine” Chlorine shock
 - Secondary treatment
 - Point of Entry
 - Point of Use

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Typical On-site Treatment Systems

- Continuous free chlorine (2-4 mg/L)
- Continuous copper-silver ionization
- Continuous chloramines (1.5-3.0 mg/L)
- Continuous chlorine dioxide (0.5-0.8 mg/L)
- Point-of-use filtration (0.2 μ)



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Regulatory Problem

Per the Safe Drinking Water Act, customer connections are not defined to be a waterworks, unless they:

- **Sell the water past the meter connection; or**
- **Provide additional water treatment.**

On-site treatment (on the premise plumbing system) means that the facility is no longer just a customer connection, but is now a regulated waterworks.

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VDH Response

- **Educate VDH staff (ODW, OEHS, LHDs, others)**
- **Talk with manufacturers who are selling equipment**
- **Assess the size of the pending regulatory arena (how many hospitals, hotels, etc., have installed treatment, what kinds)**

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EPA Approach

- Multi-agency taskforce (EPA, CDC, various states) developed a guidance document, to evaluate treatment technologies
- Currently under “in-house review”
- Stakeholder meeting this year
- Publication later this year

- The “definition of treatment” to be addressed separately.
- *Legionella* was on CCL3, is on CCL4

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Questions?



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