

2009 HOSPITALITY LAW CONFERENCE

“Something in the Water”



Brian G. Shelton, MPH

President & CEO, PathCon Laboratories

Ben Kollmeyer, MPH, CIH

Chief Technical Officer, Forensic Analytical Consulting Services



Presenters



Brian G. Shelton, MPH

- President of PathCon Laboratories in Norcross, GA
- Developed Legionella interpretive criteria now adopted by OSHA
- Specializes in pathogenic microbes found in buildings



Ben Kollmeyer, MPH, CIH

- Chief Technical Officer, Forensic Analytical Consulting Services
- Experience in large & high profile hotel investigations
- Develops prevention programs and stakeholder communications



The Hospitality Context





Overview

- The Organism
- The Disease
- Epidemiology
- Case Studies - Selected Outbreaks
- Transmission
- Prevention & Response



Agents & Issues

LEGIONELLA



Legionella - The Organism

- Environmental microbe
- Bacterium - Legionella pneumophila
- Lives in water
 - rivers, lakes, streams
- Found in municipal water
 - survives treatment
- Can grow in building water systems
 - cooling towers, jacuzzis, decorative fountains, potable water systems



Legionella - The Disease

- Legionnaires Disease
 - Fever, chills, cough with or without muscle aches, headaches, lethargy
- Pontiac Fever
 - Flu like symptoms



Legionella - Epidemiology

- Incubation period is 2-10 days
- Risk factors - age, smoking, male, underlying diseases
- 25,000 estimated cases in US per year
- Number of reported cases doubled over last 4 years



Legionella - Case Studies

- Discussion of real world outbreaks.



Legionella - Transmission

- Initial contamination
- Subsequent amplification
- Aerosolization
- Exposure and inhalation
- Onset of disease



Legionella - Prevention & Response

- **Key Issues:**
 - Public health agency response actions.
 - Sampling plans (timing and quantity).
 - Treatment plans.
 - Preventative design & construction.
 - Pre-Occupancy sampling.
 - Ongoing maintenance.



Legionella - Multidisciplinary Team

- **Legionella Team**
 - Environmental Health Consultant
 - Microbiology Laboratory
 - Water Systems Engineer
 - Treatment Contractor
- **Property Team**
 - Legal
 - Risk Management
 - Facilities
- **Construction Team**
 - Architects
 - General Contractor
 - Plumbing Subcontractor
 - Owner



Legionella - Hazard Control Plan

Hazards & Risks



What can go wrong?

Critical Control Measures



How do we prevent and respond to problems?

Verification Procedures



How do we ensure actions occur and are documented?

Responsible Parties

Who gets it done and when?



Legionella - Hazard Control Plan

FACS Healthy Building Program
Exemplar Legionella Hazard Control Program for Building Owner

HCP#	Hazard Description	Critical Control Measures	Verification Procedures	Responsible Party
1.00	Design Phase			
1.01	Design team inadvertently designs a building that is at increased risk of developing a Legionella problem.	a) Educate design team regarding Legionella risk factors and control measures. b) Establish project-specific design criteria to help prevent Legionella amplification in the future.	Documented training session conducted by a qualified trainer. Design criteria punch-list.	
1.02	Mist-generating water systems are juxtaposed where people are likely to be exposed (e.g., cooling towers & outdoor air intakes, fountains).	a) Site and design such water systems in a manner to minimize people's exposure to mists. b) Ensure provisions are in place on such systems to control the amplification of Legionella.	Completed design criteria punch list. Completed design criteria punch list.	
1.03	Water systems are designed such that areas of stagnant water routinely develop, leading to Legionella amplification.	a) Design continuous loop systems for hot and cold water. b) Identify and minimize dead legs in water system design.	Completed design criteria punch list. Completed design criteria punch list.	



Legionella – Managing Risks

- Design Phase
 - Lack of understanding by design team.
 - Juxtaposition of mist-generating systems.
 - Stagnant water in system.
 - Lack of backflow controls.
 - Inadequate temperature performance.
 - Inadequate temperature data points.
 - Inadequate sampling and treatment locations.
 - Finish fixtures prone to amplification.
 - Contaminated supply.



Legionella – Managing Risks

- **Construction Phase**
 - Lack of understanding by construction team.
 - Organic debris into plumbing components.
 - Backflow from construction conditions.
 - Failure to incorporate design provisions.
 - Finish fixtures contaminated during start-up.



Legionella – Managing Risks

- **Commissioning Phase**
 - Excessive delays from response actions.
 - Systems do not perform to design specs.
 - Possible contamination during construction.
 - Contamination found during assessment.
 - Improper maintenance before turnover.



Legionella – Managing Risks

- **Occupancy/Maintenance Phase**
 - Lack of understanding by maintenance staff.
 - Improper temperature control.
 - Failure of backflow prevention.
 - Improper maintenance of high-risk systems.
 - Contamination during off-line repairs.
 - Biofilms in finish fixtures.
 - “Lack of use” deadlegs.
 - Misuse of water systems.
 - Contaminated supply.
 - Reported cases.



Agents & Issues

NOROVIRUS



Norovirus - The Organism

- Microscopic intestinal human virus
- Size (30nm in \varnothing)
- Highly resistant to many disinfectants
- Can survive on surfaces for weeks to months



Norovirus - The Disease

- Gastroenteritis
 - nausea, vomiting, diarrhea, headaches, chills, fever
 - symptoms can vary by individual
- Incubation Period - 24 to 48 hours
- Duration - 12 hours to 3 days
- Shed in high numbers from infected individuals
- Shedding can occur for several days after symptoms subside



Norovirus - Epidemiology

- Estimated at more than 20 million cases per year in the US
- Perhaps as high as 50% of all food-borne illnesses
- Infectious dose - < 100 viruses
- Worldwide distribution



Norovirus - Case Studies

- Discussion of real world outbreaks



Norovirus - Transmission

- Fecal-oral route of transmission
- Contact with contaminated fomites
- Ingestion of contaminated food or water
- Direct person to person spread



Norovirus - Prevention & Response

A Spectrum of Issues

HIGH HAZARD



AGENTS

Anthrax

E. Coli
Noroviruses

MRSA, Sewage

Cold/Flu

RESPONSES

Emergency

Government Mediated

Commercial

Routine Cleaning

LOW HAZARD



Norovirus - Cleaning Up

- **Scope of cleaning**
 - High-Hazard = clean every surface
 - Low-Hazard = clean contact surfaces
- **EPA approved disinfectants**
 - Agent-specific approvals
 - “Sanitize” vs. “Sterilize”
- **Evaluating cleanliness**
 - Direct-reading instruments
 - Agent-specific sampling



Agents & Issues

OTHER AGENTS



THANK YOU!

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