



Ask an IP

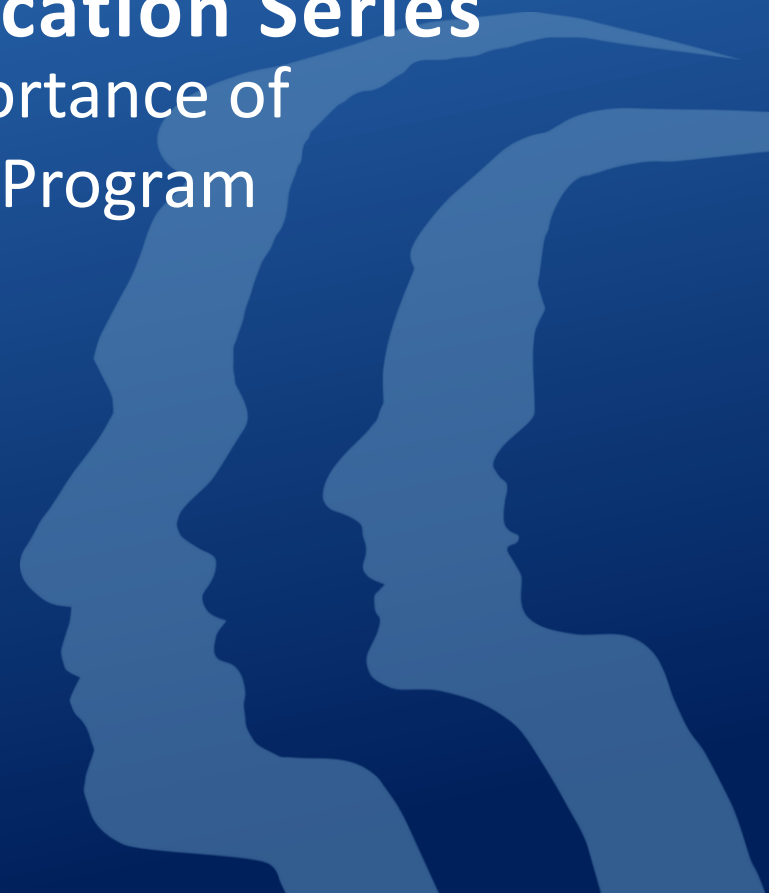
Learning and Communication Series

Legionella and the Importance of a Water Management Program

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Acute Communicable Disease Control (ACDC) Program

Los Angeles County Department of Public Health





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Website:

<http://publichealth.lacounty.gov/acd/AskAnIPProgram/index.htm>



Disclosures

- There is no commercial support for today's call
- Neither the speakers nor planners of today's call have disclosed any financial interests related to the contents of this meeting
- This call is meant for healthcare facilities and is off the record, reporters should log off now



Housekeeping

- **Microphones** are disabled. For questions, please use the chat
- **Cameras:** please keep them turned off during the presentation
- **Recording:** the presentation is being recorded and will be posted on the Ask an IP Website within a few weeks following the session
- We will not review COVID-19 guidelines (including CDPH AFLs) during these sessions



Objectives

- Review the importance of a water management program (WMP) and identify basic components required for Skilled Nursing Facilities (SNFs)
- Identify opportunistic waterborne pathogens, like Legionella and how to avoid favorable conditions for growth and spread of these pathogens
- Review clinical presentation and symptoms of legionellosis and how it is transmitted



Audience Question?

Does your facility have a Water Management Program (WMP) or
Water Management Policy?

(Please enter “yes” or “no” in the chatbox)



...It's a Requirement

- Water management program is required for our SNFs
 - CMS (QSO-17-30 rev. 2018)
 - CDPH (AFL 18-39)
 - Title 42 Code of Federal Regulations
- Team must be multidisciplinary
- Water management program and policies must be reviewed and updated regularly (at minimum annually)
- Maintains compliance with other applicable federal, state, and local requirements



Requirements Continued...

- Conduct a facility risk assessment to identify where legionella and other opportunistic waterborne pathogens could grow and spread in the facility water system
- Develop and implement a water management program that considers American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) industry standards and the CDC toolkit
- Specifies testing protocols and acceptable ranges for control measures, and document the results of testing and corrective actions taken when control limits are not maintained



ASHRAE

- American Society of Heating, Refrigerating, and Air-Conditioning Engineers
- Widely recognized and respected industry standard
- SNFs can use their guidance and resources to develop a Water Management Program or implement a more comprehensive water management program



CDC Toolkit

- Developing a water management program to reduce legionella growth and spread in building: a practical guide to implementing industry standards
- Scope of Toolkit:
 - Yes/no worksheet to determine if an entire building or parts are at increased risk
 - Review of elements of water management program
 - Scenarios describing common water quality problems and examples of how to respond



Water Management Program (WMP)





Components of a Water Management Program

- Description and diagram of water system
- Control measures
- Verification and validation process
- Remediation plan
- Documentation of activities
- Communication with water management program team
- Sustainable policy and program

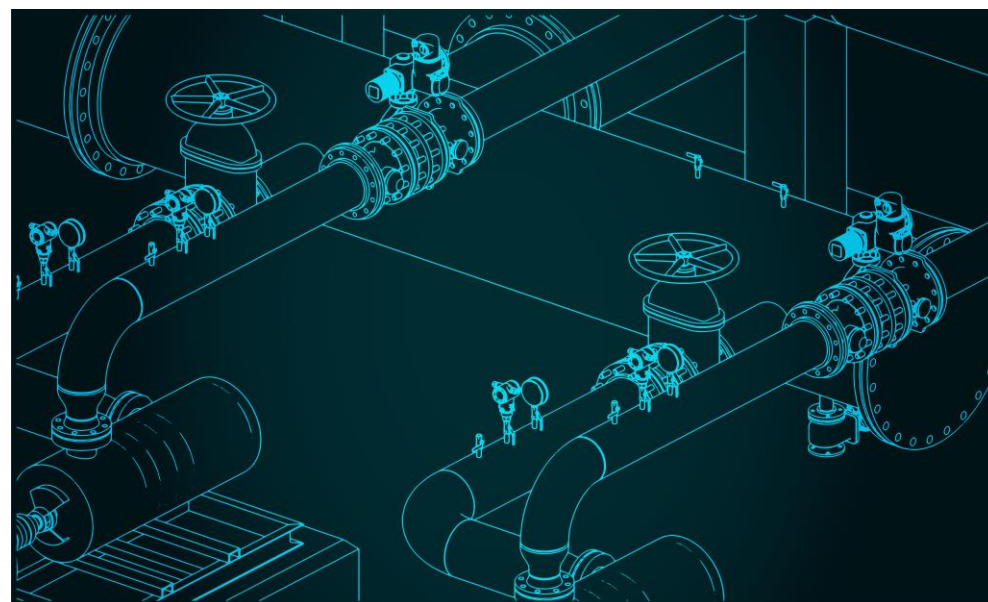


Description of Water and HVAC System Components

- This includes:
 - Facility
 - Pipes and plumbing
 - Water fixtures
 - HVAC fixtures
 - Details on equipment in the system
 - Manufacturer information
 - Vendor information

Diagram the System

- Pictures and diagrams are key
- Facility map
- Blueprints with water fixture and plumbing information
- Direction of air and water flow within the system
- Identify areas for high risk of stagnation, aerosolization, and other concerns





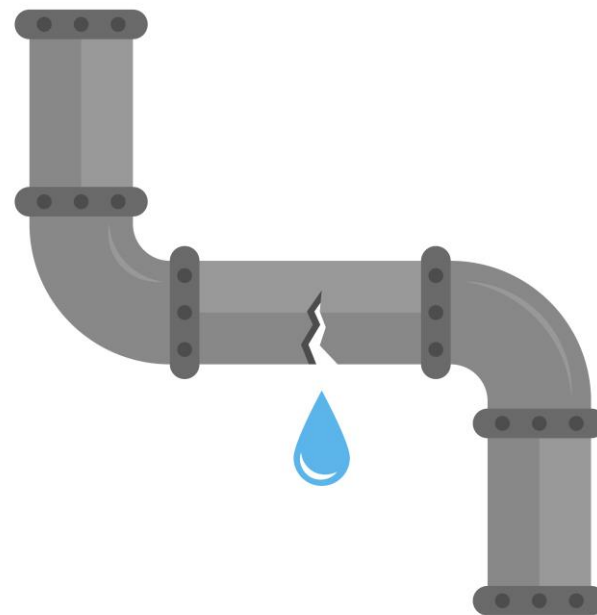
Audience Question?

Do you have a diagram of your facility with all the things described on the previous slides?

(Please enter your answer in the chatbox)

Possible Areas for Concern

- Sinks, showers, toilets, bathrooms
- Ice machine
- Cooling tower
- Water fountains
- Unoccupied rooms or areas of the building
- Broken fixtures
- Areas of low or no-flow stagnation
- Water heaters
- Reservoirs





Control Measures

- Actions taken to ensure the quality of your water and reduce the risk of waterborne pathogens
 - Control points: locations in the water system where control measures are put into place
 - Control limits: upper and lower limits (temperature, pH, etc.)
- At least 1 control measure for each control point



Active Monitoring and Reducing Risk

- Taking regular measurements
- Know control limits
- Identify and plan interventions for possible challenges or out-of-range findings
- Reference industry standards and guidelines



Enhanced Control Measures Needed for...

- Facilities and environmental emergencies
- Ruptures of nearby water mains
- System start-up or shut-down
- Legionella-positive environmental specimens
- Equipment upgrade or repair or removal
- Construction projects on site or in the vicinity



Enhanced Patient Surveillance

- Monitor for new healthcare-onset pneumonia
- Communicate with providers about testing for legionellosis and other waterborne pathogens



Verification and Validation

- Verification: ensuring that a particular activity is being performed regularly and correctly
 - Are we doing what we said we would do?
- Validation: regularly monitor the performance of your water and heating, ventilation and air conditioning (HVAC) systems to ensure the effectiveness of your water management program
 - Is our program working?



Remediation

- Taking corrective action
- Several interventions may be required
- Was remediation successful?



Documentation of Activities

- Checklists and logs are your best friends
- Automate systems and keep data electronic
- Take note if any corrective action was taken
- Have an alternative or external source verify control measures and test systems
- Record fine details
 - Dates, who did what, values, observations



Audience Question?

Does your facility have a water management program team?

(Enter “yes” or “no” in the chatbox)



Communication with Water Management Program Team

- Who is on your water management program team?
- Multidisciplinary team is key!
- People you may want to include on the team:
 - IP
 - Facilities engineer or maintenance staff
 - Admin
 - Director of Nursing (DON)
 - Director of Staff Development (DSD)
 - EVS
 - Outside vendors



When to Communicate

- Infection control committee meetings
- Environment of care meetings
- Routine and standard meetings with agenda and items to report



Atypical Communication

- Unusual events that might require team communication:
 - Construction
 - Water main breaks
 - Disruptions to water or HVAC systems
 - Emergencies or emergency shutdowns
 - Unplanned outage
 - Residents with healthcare-onset pneumonia
 - Other unusual occurrences



Sustainable Policy and Program

- It's not a one-time policy you create and forget, it takes work
- Team effort
- Regular communication
- Designate staff with responsibilities
- Monitoring and surveillance
- Emergency preparedness



Warning Signs!





Audience Question?

Has your facility faced any water system failures or emergencies?

Please enter your response into the chatbox



Audience Question?

Were there any warning signs that you noticed prior to water system failure or emergency?

Please enter your response into the chatbox



What are the Warning Signs?

- Issues you have your water management program in place for, to avoid at all costs and to remedy as soon as possible
- Water stagnation
- Unused fixtures
- Dead legs
- Out of range values
- Biofilm, sediment, scale
- Out of service, maintenance needed

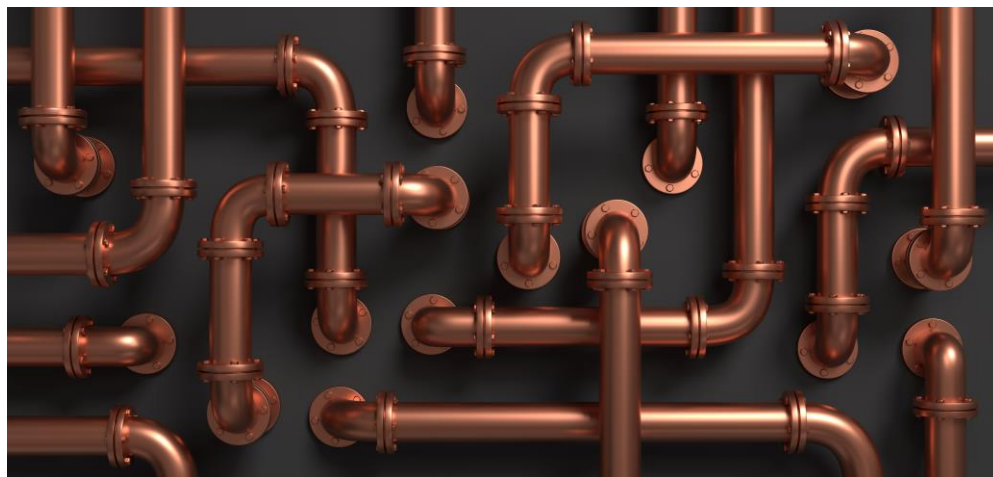


Water Stagnation

- When water remains still or motionless for an extended period, it promotes microbial growth
- Can occur in our plumbing system especially in areas of low water usage or infrequent flushing

Dead Legs

- Sections of piping where water flow is restricted or non-existent, this can lead to water stagnation
- Occur in parts of plumbing systems that are no longer in use
- Can be a result of poor plumbing design



Unused Fixtures

- Abandoned fixtures
- Sinks, showers, faucets that are no longer in use
- Fixtures in unused patient rooms that are not frequently used
- With increased water stagnation, comes increased risk of colonization of waterborne pathogen



Out of Service – Maintenance Needed

- Broken fixtures or equipment that need repair and have had time to accumulate water
 - Drinking fountains
 - Medical equipment
 - HVAC





Out-of-Range Values

- Components of water system that are out-of-range for pH, temperature, or disinfectant levels
- Includes:
 - Water treatment equipment
 - Plumbing fixtures
 - Cold water systems
 - Hot water systems
 - Storage tanks
 - Domestic water supply

Biofilm

- Slimy film composed of microorganisms that can thrive in contact with water
- Serves as a reservoir for dangerous pathogens
- Can impact water quality and contribute to out-of-range values
- Can be found in:
 - Pipes
 - Fixtures
 - Water storage tanks



Sediment

- Solid particles that accumulate in water systems over time
- Can lead to decreased water flow, pressure drops, reduced heat efficiency, and increased biofilm formation
- Sources include:
 - Water supply
 - Corrosion of pipes
 - Mineral deposit



Scale

- Hard mineral deposit that forms on the surface of pipes, fixtures, and equipment due to precipitation of minerals like calcium and magnesium from water
- Can restrict water flow, lead to overheating and scalding issues, and can induce biofilm growth





Waterborne Pathogens to Look Out for





Audience Question?

What are some waterborne pathogens that you have heard about?

(Please enter your response into the chatbox)

Pseudomonas

- Pseudomonas aeruginosa can cause infections in blood, lungs (pneumonia), and other parts of the body
- Becoming increasingly antibiotic resistant
- Can be spread with exposure to contaminated water
- Those who are at increased risk:
 - Ventilator patients
 - Patients with catheters
 - Patients with wounds, burns, or post-surgical





Acinetobacter

- Found in the soil and water
- Can cause infections in blood, urinary tract, lungs (pneumonia), and wounds
- Can colonize without symptoms
- Becoming increasingly antibiotic resistant
- *Acinetobacter baumannii* is most common in humans
- Can live on shared equipment and contaminated water sources
- Can spread through indirect and direct contact



Burkholderia

- Burkholderia cepacia most common in healthcare
- Increasing antibiotic resistance
- High risk for those with lung disease, cystic fibrosis, and immunocompromised
- Can spread via:
 - Contaminated water source
 - Person-to-person contact
 - Contact with contaminated surface



Stenotrophomonas

- Found in water
- Spread via contaminated water source or medical device
- Direct contact with source
 - Hands typically being the big culprit from healthcare staff to patient
- Commonly affects blood and lungs
- Can cause pneumonia, shortness of breath, cough with mucus



Nontuberculous mycobacteria (NTM)

- Found and spread through contaminated water sources and natural water sources (lakes, rivers, etc.)
- Can form strong biofilms
- Can cause infections in a variety of body sites including skin, soft tissue, lymph nodes, and blood
- Symptoms include fever, weight loss, loss of energy, and night sweats
- Increased risk for those who:
 - Have underlying lung disease
 - Are immunocompromised



Audience Question?

What waterborne pathogen was not reviewed in this section that may be of concern in our facilities?

Hint: It's a big one, probably the most recognized one (included in AFL for water management program)

Answer

LEGIONELLA!





Introduction to Legionellosis





Legionella and Legionellosis

- Bacteria that thrives in complex water systems
- Contaminates water and water vapor (steam or mist)
- Legionellosis: the illness that encompasses both Legionnaire's disease and Pontiac Fever
- Legionnaire's disease: severe form of pneumonia caused by Legionella
- Pontiac Fever: milder, flu-like illness



How does Legionella Spread?

- Spread by inhaling contaminated aerosols
- Aspirating contaminated water into lungs

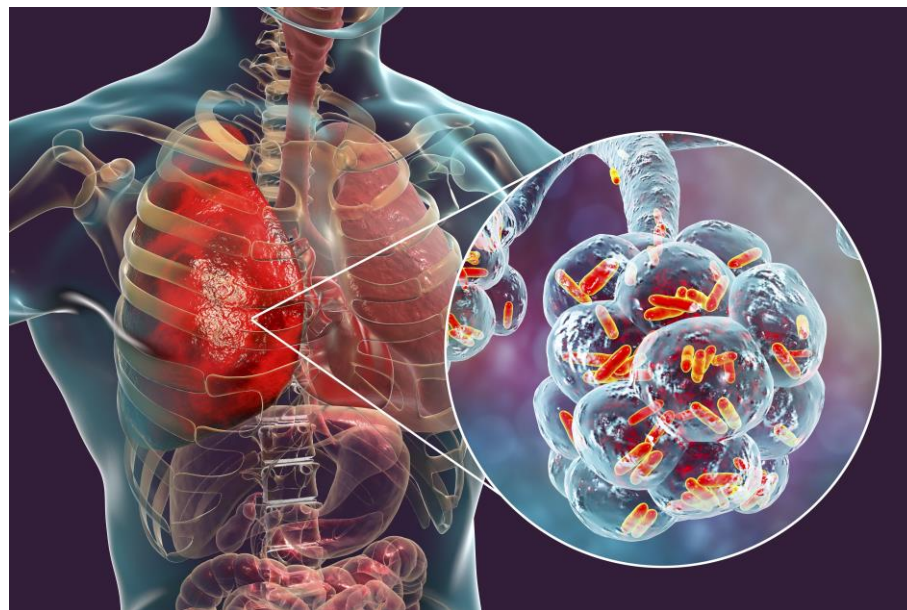


Signs and Symptoms

- Cough
- Fever
- Shortness of breath
- Headache
- Body aches
- Muscle aches
- Nausea
- Diarrhea
- Vomiting
- Weakness
- Confusion
- Falls
- Pneumonia

Complications

- Respiratory failure
- Acute kidney injury
- Septic shock
- Multiorgan failure
- Neurological complications, less common
- Pneumonia
- Hospitalization
- Death, less common





Risk Factors

- Age 50 or greater
- Immunocompromised
- Chronic disease
- Comorbidities
- Aspiration risk
- Recent healthcare exposure

Diagnosis

- Urinary Antigen Test (UAT): most common method, urine testing
- Culture of respiratory secretions: less common, sputum or bronchoalveolar lavage fluid, longer turnaround time
- Serologic and polymerase chain reaction (PCR) testing, uncommon

Treatment

- Antibiotic treatment
- Medications to treat symptoms



Audience Question?

Is legionellosis on the LAC DPH Reportable Diseases and Conditions list?

Please enter “yes” or “no” in the chatbox



Answer

YES



Reportable Diseases and Conditions List

Please Post

Revised March 8, 2024



REPORTABLE DISEASES AND CONDITIONS

Title 17, California Code of Regulations (CCR), § 2500

It is the duty of every health care provider, knowing of or in attendance on a case or suspected case of any of the diseases or conditions listed below, to report to the local health officer for the jurisdiction where the patient resides. "Health care provider" encompasses physicians (surgeons, osteopaths, oriental medicine practitioners), veterinarians, podiatrists, physician assistants, registered nurses (nurse practitioners, nurse midwives, school nurses), infection control professionals, medical examiners/coroners, dentists, and chiropractors, as well as any other person with knowledge of a case or suspected case.

Note: This list is specific to Los Angeles County and differs from state and federal reporting requirements ★

- ☎ Report **immediately** by telephone for both confirmed and suspected cases.
- 📞 Report by telephone **within 1 working day** from identification.
- 📞 Report by telephone **within 24 hours** for both confirmed and suspected cases.
- ✉ Report by electronic transmission (including FAX or email), telephone or mail **within 1 working day** from identification.
- 📧 Report by electronic transmission (including FAX or email), telephone or mail **within 7 calendar days** from identification.
- ★ **Mandated by and reportable to the Los Angeles County Department of Public Health.**
- ± If enrolled, report electronically via the **National Healthcare Safety Network** (www.cdc.gov/nhsn/index.html). If not enrolled, use the LAC DPH **CRE Case Report Form** (publichealth.lacounty.gov/acd/Diseases/EpiForms/CRERepSNF.pdf)
- For TB reporting questions: contact the TB Control Program (213) 745-0800 or visit www.publichealth.lacounty.gov/tb/healthpro.htm
- For HIV/STD reporting questions: contact the Division of HIV and STD Programs. HIV (213) 351-8516, STDs (213) 368-7441 www.publichealth.lacounty.gov/dhsp/ReportCase.htm

For laboratory reporting: www.publichealth.lacounty.gov/lab/index.htm **For veterinary reporting:** www.publichealth.lacounty.gov/vet/index.htm

REPORTABLE COMMUNICABLE DISEASES

- | | | |
|---|--|---|
| 📧 Anaplasmosis | 📧 Giardiasis | ✉ Pertussis (Whooping Cough) |
| ☎ Anthrax, human or animal | 📧 Gonococcal Infection ■ | ☎ Plague, human or animal |
| ✉ Babesiosis | ✉ <i>Haemophilus influenzae</i> , invasive disease only, all serotypes, less than 5 years of age | 📞 Poliovirus Infection |
| ☎ Botulism: infant, foodborne, or wound | ✉ Hantavirus Infection | ✉ Psittacosis |
| 📧 Brucellosis, animal; except infections due to <i>Brucella canis</i> | ☎ Hemolytic Uremic Syndrome | ✉ Q Fever |
| ☎ Brucellosis, human | ✉ Hepatitis A, acute infection | ☎ Rabies, human or animal |
| ✉ Campylobacteriosis | 📧 Hepatitis B, specify acute, chronic, or perinatal | ✉ Relapsing Fever |
| ✉ <i>Candida auris</i> , colonization or infection | 📧 Hepatitis C, specify acute, chronic, or perinatal | 📧 Respiratory Syncytial Virus, only deaths in a patient less than 5 years of age |
| 📧 Carbapenem-Resistant <i>Enterobacteriaceae</i> (CRE), including <i>Klebsiella sp.</i> , <i>E. coli</i> , and <i>Enterobacter sp.</i> , in acute care hospitals or | 📧 Hepatitis D (Delta), specify acute or chronic | 📧 Rickettsial Diseases (non-Rocky Mountain Spotted Fever), including Typhus and Typhus-like Illnesses |



Healthcare-Onset Legionellosis

- Incubation period
 - 2-14 days prior to symptom onset
- Presumptive healthcare-associated
 - 10 days or more of incubation period in healthcare facility
- Possible healthcare-associated
 - Less than 10 days of incubation period in healthcare facility



Reporting to Public Health (LAC DPH)

- Report confirmed OR suspected legionellosis cases within 7 days
- LAC DPH may request medical records
- Facility physician or provider must notify the patient that public health may reach out to them with further follow up



References + Resources

- APIC Text (Water System Issues and Prevention of Waterborne Infectious Disease in Healthcare Facilities)
 - <https://text.apic.org/toc/infection-prevention-for-support-services-and-the-care-environment/water-systems-issues-and-prevention-of-waterborne-infectious-diseases-in-healthcare-facilities>
- ASHRAE
 - <https://www.ashrae.org/technical-resources/standards-and-guidelines/guidance-for-water-system-risk-management>
- CDC Toolkit
 - <https://www.cdc.gov/legionella/wmp/toolkit/index.html>



References + Resources

- CDC Waterborne Pathogen Information
 - <https://www.cdc.gov/healthywater/surveillance/burden/index.html>
- CDPH AFL 18-39
 - <https://www.cdph.ca.gov/Programs/CHCQ/LCP/Pages/AFL-18-39.aspx>
- CMS QSO 17-30
 - <https://www.cms.gov/medicare/provider-enrollment-and-certification/surveycertificationgeninfo/downloads/qso17-30-hospitalcah-nh-revised-.pdf>



References + Resources

- LAC DPH Legionella Web Page
 - <http://publichealth.lacounty.gov/acd/diseases/Legion.htm>
- LAC DPH Reportable Diseases and Conditions List
 - <http://publichealth.lacounty.gov/acd/docs/ReportableDiseaseList.pdf>
- TNT Water Management and Legionellosis Presentation
 - <http://publichealth.lacounty.gov/acd/TNTProgram/index.htm>



Questions





LACDPH Project Firstline

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PROJECT FIRSTLINE

Project Firstline (PFL) is a national training and education collaborative created by the Centers for Disease Prevention and Control (CDC) to increase infection control knowledge and understanding among the frontline healthcare workforce.

Project Firstline's innovative content is designed so that—regardless of a healthcare worker's previous training or educational background—they can understand and confidently apply the infection control principles and protocols necessary to protect themselves, their residents, their facility, their family, and their community from infectious disease threats, including COVID-19.



**Our next Ask an IP session will be on
Wednesday, May 8 at 1:30pm!**

