Legionella Investigation for Local Health Departments

Tuesday, June 22, 2021

11am-12pm

NJ Department of Health-Communicable Disease Service

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- Slides from today's webinar will be posted to the NJDOH-CDS Legionellosis webpage.

2

Continuing Education Credits

- Credits offered for this webinar:
  - 1.0 Public Health and Nursing
- Credits provided to those who attend the webinar "live"
  - Must be registered on NJLMN and complete evaluation to earn credits.
  - NOTE: Those viewing the recorded webinar are **not** eligible to receive continuing education credits. Sorry!
  - Posted webinars are available for 12 months after original air date.

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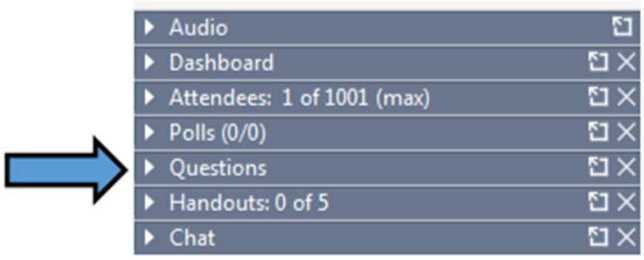
Have a Question During the Presentation?

- All attendee lines are muted. Please use the "Question" box to ask a question.
  - Questions will be answered at the end of the webinar, time permitting.



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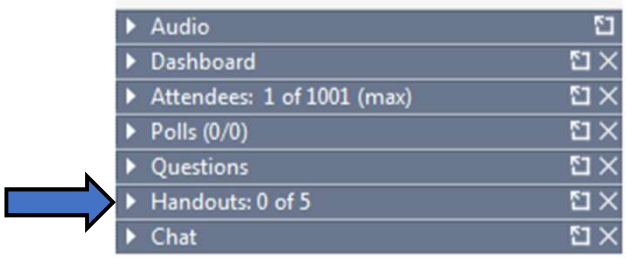
Presenter Slides

- Slides may be accessed in the "Handouts" box during "live" webinars.
- Slides will be posted on the disease webpage, after the webinar



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How Do I Get My Credits?

- A link to the evaluation will sent to the e-mail address used to register on NJLMN after the webinar.
  - Please add NJLMN@njlincs.net to your address book/safe sender list to ensure that you get the email
- Those seeking continuing education credits MUST complete the evaluation.
- Evaluation link closes 7 days after it is sent.
  - Once evaluation closes, certificated are emailed to the address listed in NJLMN (for Nurses)/attendance verified in NJLMN (for PH and Nurses). Credits are **not** automatically awarded when evaluation is completed.
  - Individuals who do not complete the evaluation will not receive credits. No exceptions.

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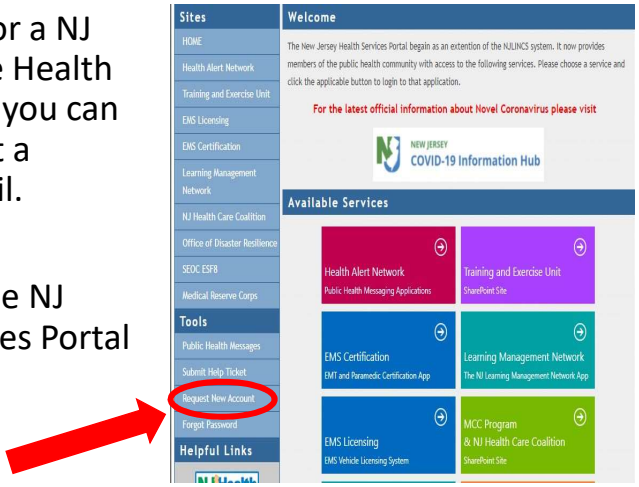
LINCS Accounts/Emails

- If you work for a NJ Local or State Health Department, you can sign up to get a NJLINCS email.
- Sign-up on the NJ Health Services Portal at njlincs.net



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Legionellosis Investigation Guidance for Local Health Departments

Infectious and Zoonotic Disease Program | Communicable Disease Service

New Jersey Department of Health

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Agenda

Lauren Conner, MPH, REHS
***Legionella* Epidemiologist | Research Scientist 2**

Legionellosis Overview
Etiology, Transmission, Sources

Public Health Involvement
Nationally and Locally

Single Case Investigations
Case Definitions, Reporting, and Considerations

Outbreak Investigations
Surveillance, Response, and Considerations

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What is *Legionella*?

- Bacterium
- Identified in 1977
- Naturally found in freshwater environments
- Thermophiles (77 ° - 113 ° F)
- Over 60 different species (*Legionella pneumophila* ~ 90 % U.S reported cases)
- Transmission through contaminated air droplets
  - **Aerosolization**: Breath in water droplets containing *Legionella*
  - **Aspiration**: "Water goes down the wrong pipe"
  - ***Not person-to-person***

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Legionellosis

	Legionnaires' Disease	Pontiac Fever
Description	Severe form of pneumonia	Flu-like illness
Attack Rate	Low Attack Rate: 5%	High Attack Rate: 90%
Mortality Rate	High Mortality Rate: 10-25%	No Mortality
Signs & Symptoms	Body aches, Fever, Headache, Cough, SOB	Body aches, Fever, Headache
Incubation Period	2-14 days after exposure	24 to 72 hours after exposure
Diagnosis	Pneumonia	No Pneumonia
Treatment	Antibiotics	Self-limiting/ Supportive Care

*Extrapulmonary legionellosis: Infection at a body site outside of the lungs such as the heart or wound infection.

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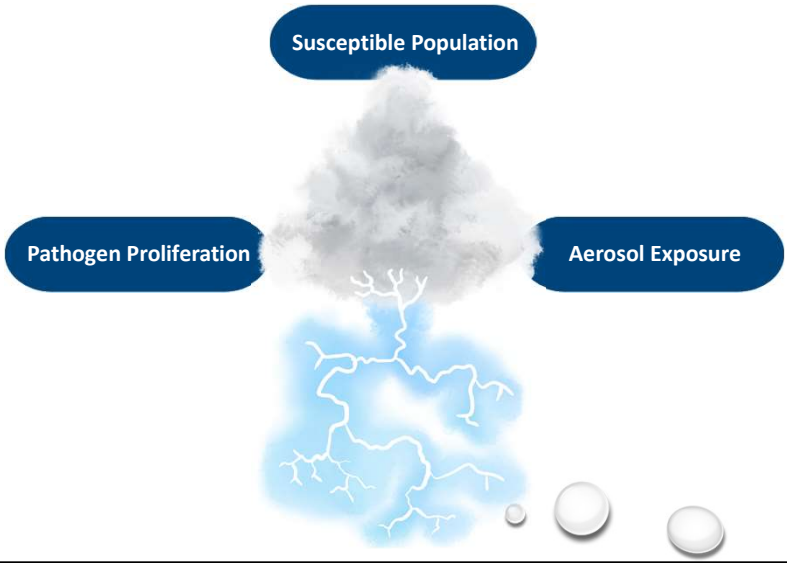
Risk of Contracting Legionellosis



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Susceptible Population

Older individuals (e.g., Age 50≥ years)

Those with chronic lung disease such as emphysema or COPD

Current or former smokers

Having underlying illnesses such as diabetes, kidney failure, and/or liver failure

Immune system disorders due to disease or medication

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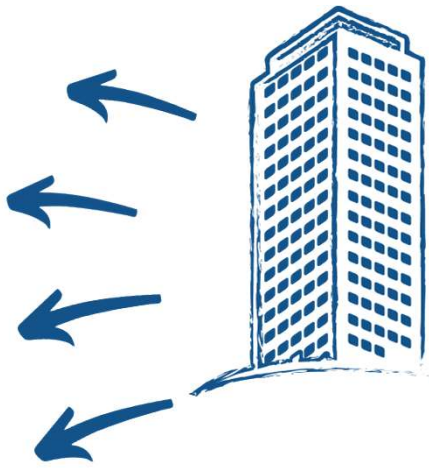
Pathogen Proliferation

- Warm water temperatures
- Dead Legs & Low Flow Rates
- Scale, Corrosion, Sediment, and Organic Matter
- Insufficient Disinfectant Residual (CL)



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Building Transmission Sources

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Additional Transmission Sources

CPAP Machine

Nebulizer

Potting Soil

Cruise Ship

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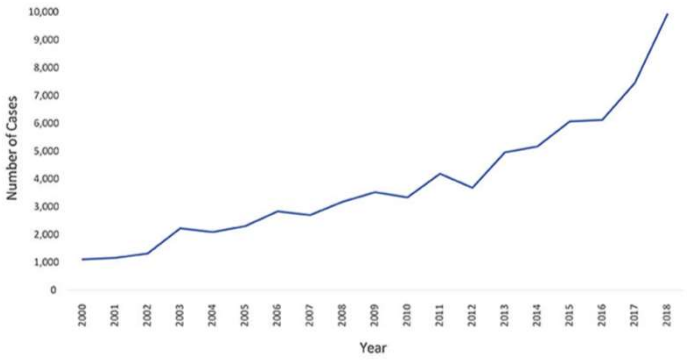
The rate of reported cases in the U.S. has grown 9x since 2000



Source: Nationally Notifiable Diseases Surveillance System

402,000,000

In total U.S. annual direct **healthcare** costs

10,000

U.S. health department reported cases in 2018

2nd

Leading cause of death for domestically acquired waterborne diseases

Why has incidence increased?

May be due to increased **awareness**, increased **testing**, increased **susceptibility of the population**, increased ***Legionella* in the environment**, or some **combination of factors**.

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Public Health Involvement in the United States

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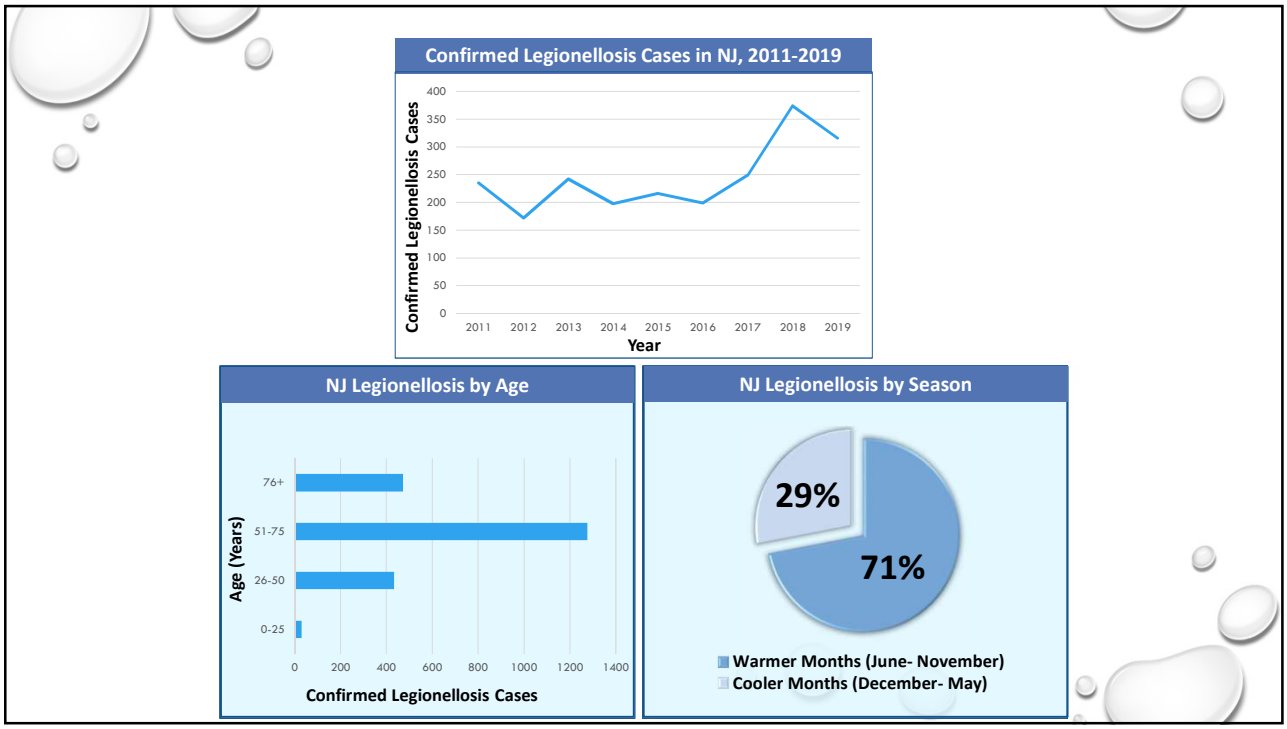

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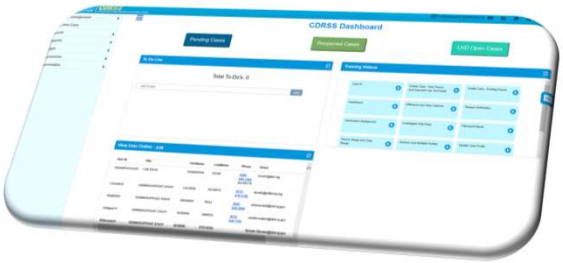
Public Health Involvement in the New Jersey

- Per N.J.A.C. 8:57, disease reportable within 24 hours of diagnosis **(confirmed and suspected cases)**
  - Hospital
  - Laboratory
  - Local Health Department
- Communicable Disease Reporting and Surveillance System (CDRSS)
- **Local Health Departments** are responsible for performing a disease investigation into each case reported in their jurisdictions
- **NJDOH** assists with outbreak investigations and provides technical expertise
- Goals of Surveillance:
  - ✓ Determine if the case definition is met
  - ✓ Identify cases with a common exposure
  - ✓ Identify opportunities for control and prevention



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Legionellosis Confirmed Case Definitions

Legionnaires' Disease

- **Confirmed LD:**
  1. Clinically compatible case of LD
  2. Confirmatory laboratory evidence for *Legionella*
- **Clinical Criteria:**
  - Presents as pneumonia, diagnosed clinically and/or radiographically
- **Laboratory Criteria:**
  - Urinary Antigen Test (UAT)
  - Culture
  - PCR
  - Serology

Pontiac Fever

- **Confirmed PF:**
  1. Clinically compatible case of PF
  2. Confirmatory laboratory evidence for *Legionella*
- **Clinical Criteria:**
  - Does not present as pneumonia
- **Laboratory Criteria:**
  - Urinary Antigen Test (UAT)
  - Culture
  - PCR
  - Serology

Extrapulmonary Legionellosis

- **Confirmed XPL:**
  1. A clinically compatible case of XPL
  2. Confirmatory laboratory evidence for *Legionella* at an extrapulmonary site
- **Clinical Criteria:**
  - Disease at an extrapulmonary site and diagnostic testing indicates evidence of *Legionella* at that site.
- **Laboratory Criteria:**
  - Culture
  - PCR

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Legionellosis Suspect Case Definitions

Legionnaires' Disease

- **Suspected LD:**
  1. Clinically compatible case of LD
  2. Supportive laboratory evidence for *Legionella*.
- **Clinical Criteria:**
  - Presents as pneumonia, diagnosed clinically and/or radiographically
- **Laboratory Criteria:**
  - Serology
  - Direct Fluorescent Antibody (DFA)
  - Immunohistochemistry (IHC)

Pontiac Fever

- **Suspected PF:**
  1. Clinically compatible case of PF
  2. Supportive laboratory evidence for *Legionella*
- **Clinical Criteria:**
  - Does not present as pneumonia
- **Laboratory Criteria:**
  - Serology
  - Direct Fluorescent Antibody (DFA)
  - Immunohistochemistry (IHC)

Extrapulmonary Legionellosis

- **Suspected XPL:**
  1. A clinically compatible case of XPL
  2. Supportive laboratory evidence for *Legionella* at an extrapulmonary site
- **Clinical Criteria:**
  - Diagnostic testing indicates evidence of *Legionella* from an extrapulmonary site of disease
- **Laboratory Criteria:**
  - Direct Fluorescent Antibody (DFA)
  - Immunohistochemistry (IHC)

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CSTE Laboratory Criteria

A2. Laboratory Criteria

***Confirmatory laboratory evidence*:**

- Isolation of any *Legionella* organism from lower respiratory secretions, lung tissue, pleural fluid, or extrapulmonary site
- Detection of any *Legionella* species from lower respiratory secretions, lung tissue, pleural fluid, or extrapulmonary site by a validated nucleic acid amplification test
- Detection of *Legionella pneumophila* serogroup 1 antigen in urine using validated reagents
- Fourfold or greater rise in specific serum antibody titer to *Legionella pneumophila* serogroup 1 using validated reagents

***Presumptive laboratory evidence*:**

None required for case classification

***Supportive laboratory evidence*:**

- Fourfold or greater rise in antibody titer to specific species or serogroups of *Legionella* other than *L. pneumophila* serogroup 1 (e.g., *L. micdadei*, *L. pneumophila* serogroup 6)
- Fourfold or greater rise in antibody titer to multiple species of *Legionella* using pooled antigens.
- Detection of specific *Legionella* antigen or staining of the organism in lower respiratory secretions, lung tissue, pleural fluid, or extrapulmonary site associated with clinical disease by direct fluorescent antibody (DFA) staining, immunohistochemistry (IHC), or other similar method, using validated reagents

CSTE Legionellosis Case Definitions: https://cdn.ymaws.com/www.cste.org/resource/resmgr/2019ps/final/19-ID-04_Legionellosis_final.pdf

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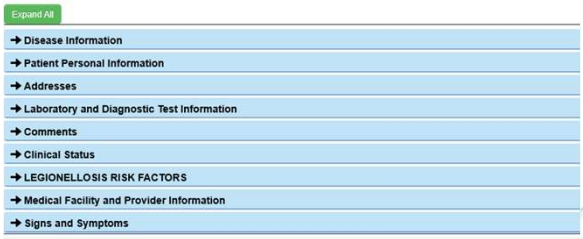
Single Case Investigation

- Illness onset date
  - First day of signs/symptoms
- Home Address
  - Primary Address
- Hospitalization dates
  - Admission date, at minimum
- Signs and Symptoms
- **Laboratory and Diagnostic Results**
  - Dates & Findings
- **Completed Legionellosis Risk Factor Form**

**If there is missing information in CDRSS, follow-up with the appropriate point of contact to complete the information (i.e., case, proxy, healthcare provider, IP)*



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Illness Onset and Medical Facility

Disease Information

Disease:	LEGIONELLOSIS				
Illness Onset Date:	09/27/2020	Age at Case Creation:	78 yrs 6 mos	Age at onset:	78 yrs 6 mos
Case Status:	CONFIRMED	Reason for Case Status Status:	UNABLE TO OBTAIN INFO FROM CASE	Date Reported to State or Local Health Department:	10/02/2020
Report Status:	DHSS APPROVED	Reason for Report Status:			
Household Size:		Type of Insurance:			
No Follow-up/Investigation:		Incomplete Follow-up/Investigation:			

Medical Facility and Provider Information

Medical Facility Information

Medical Facility Name	Patient Status	Dates of Hospitalization	Medical Facility Type	MRN	Added to Case On	Delete
(NY) NYC HEALTH AND HOSPITALS/BELLEVUE	INPATIENT	06/10/2014 - 06/14/2014	ACUTE CARE		06/14/2014	

Add Medical Facility

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Clinical Status

Clinical Status

Clinical Status Information

Illness Onset Date:		Age at onset:	58 yrs 6 mos		
Date of Initial Health Care Evaluation:		Initial Diagnosis:		Case Evaluated by Health Care Provider :	
Reason for Testing:		As part of this investigation, was patient hospitalized?:	YES		
Pre-Existing Conditions:	SEIZURES, OBESITY, MENTAL, OTHER CHRONIC DISEASES, CHRONIC RENAL DISEASE, CARDIOVASCULAR DISEASE				
Patient Died?	YES	Patient died during Investigation?	YES		
Date of Death:	03/02/2021	Was Autopsy Performed?			
Was Pathology support Diagnosis?					
Was Death Certificate Requested?:		Death Certificate Number:			
Cause of Death:		Source For Cause Of Death:			
Examiner Name1:		Examiner Phone2:			
Examiner Name2:		Examiner Phone2:			

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Signs and Symptoms

- **Part of case definition**
- **Add all symptoms**
- **Dates and Attributes**

Signs and Symptoms

Sign/Symptom	Response	Attribute	Onset Date
PNEUMONIA	YES		06/12/2019
CHILLS	YES		06/10/2019
COUGH	YES		06/10/2019
FEVER	YES	LOW	06/10/2019
MALAISE (DISCOMFORT)	YES		06/10/2019
MYALGIA (MUSCLE ACHES)	YES		06/10/2019
ANOREXIA	YES		
ABDOMINAL PAIN/CRAMPS	NO		
ALTERED MENTAL STATUS	NO		
CHEST PAIN	NO		
DIARRHEA	NO		
HEADACHE	NO		
SHORTNESS OF BREATH	NO		

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Laboratory Tests for Legionellosis

Test	Sensitivity	Specificity	Advantages	Disadvantages
Culture 	20–80%	100%	**Detects all species and subgroups**; can compare clinical and environmental isolates	Technically difficult; **slow to grow**; sensitivity dependent on technologic skill; requires BCYE agar
Urinary Antigen Test 	70–100%	95–100%	**Rapid** (same-day)	**Only detects LP1**; does not allow for molecular comparison of clinical and environmental isolates
Serology (Paired) 	80–90%	>99%	Possible to **detect species and serogroups other than LP1**	**Requires paired sera collected at acute onset to 2 weeks and 3–6 weeks later**; 5–10% of the population has a titer of ≥1:256
Polymerase Chain Reaction (PCR) 	95–99%	>99%	Can be performed on pathologic specimens (e.g., lung tissue); **rapid**; **possible to detect species and serogroups other than LP1**	**Assays vary by laboratory**; may not be commercially available in the United States

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Diagnostic Tests for LD

Test	Description	Advantages	Disadvantages	Outcomes
Chest X-Ray (CXR)	Imaging procedure to capture an internal image of the chest and indicate abnormal formations.	• Uses a small amount of radiation • Fast and easy usage • Low cost	• Produces a 2D view • Limited detail	• Consolidation • Infiltrates
Chest CT Scan	A more detailed chest x-ray that merges several detailed pictures into one projection.	• Produces a 3D view • Detailed view of the chest (i.e., position, shape, size)	• Large and complex equipment	• Opacity

If none of these findings are recorded explicitly, a description of clinical symptoms that are consistent with a diagnosis of pneumonia must be documented in order to consider it to be Legionnaires' disease. Clinical symptoms of pneumonia may vary but must include **acute onset of lower respiratory illness with fever and/or cough.*

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Laboratory and Diagnostic Tests

Laboratory and Diagnostic Test Information

Laboratory Information

Test	Specimen	Lab Name	Lab Specimen ID	Date Specimen Collected	Value	Report Units	Result
LEGIONELLA PNEUMOPHILA DNA BY PCR	OTHER/UNKNOWN	ARUP LABORATORIES	20362107780	12/27/2020	DETECTED		POSITIVE/REACTIVE
LEGIONELLA SP DNA	OTHER/UNKNOWN	ARUP LABORATORIES	20362107780	12/27/2020	DETECTED		POSITIVE/REACTIVE

Add Laboratory Test
Lab Test History

Laboratory and Diagnostic Test Information

Laboratory Information

Test	Specimen	Lab Name	Lab Specimen ID	Date Specimen Collected	Value	Report Units	Result
LEGIONELLA PNEUMOPHILA 1 AB	SERUM	(NY) NYC HEALTH AND HOSPITALS/BELLEVUE		06/10/2014	>1:16		TITER/ANTIBODY PRESENT
LEGIONELLA SP AG	URINE	(NY) NYC HEALTH AND HOSPITALS/BELLEVUE		06/10/2014	positive		POSITIVE/REACTIVE

Add Laboratory Test
Lab Test History

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Laboratory and Diagnostic Tests

Diagnostic Information

Test Name	Findings	Test Result Data	Test Date	Medical Facility	Delete
X-RAY	ABNORMAL	Abnormal chest xray	06/10/2014	(NY) NYC HEALTH AND HOSPITALS/BELLEVUE	

Add Diagnostic Test
Add Comment

Comments

Input By: GREELEY, REBECCA
(609) 826-5964
Date/Time: 06/14/2014 03:47:26
Comment Type: Laboratory and Diagnostic Test Information
Comment ID: 1134858

Comments:
Xray showed pneumonia and LLL infiltrate

Diagnostic Information

Test Name	Findings	Test Result Data	Test Date	Medical Facility
C-SCAN	ABNORMAL	Multifocal pneumonia	09/18/2020	

Add Diagnostic Test
Add Comment

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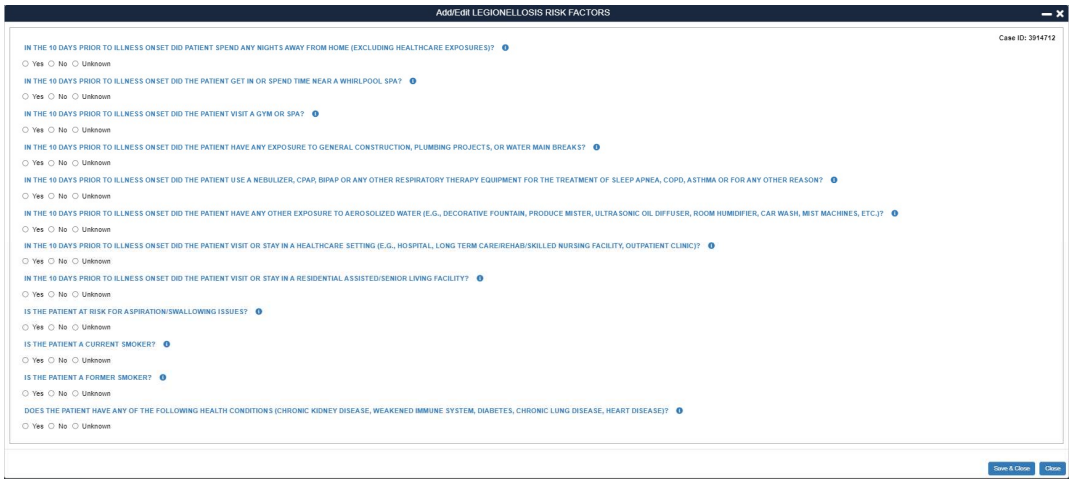
Legionellosis Risk Factor Form

Interview cases about potential exposures for the 14 days prior to illness onset



**If at least three, unsuccessful attempts were made to contact the case-patient or surrogate, complete the case in CDRSS with available information and indicate the reason for missing information (e.g., lost to follow-up).*

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Legionellosis Risk Factor Form

Identify key risk factors and other potential exposures

- Did the patient spend time in or near a hot tub? Include location address and dates of exposure
- Is the patient a current or former smoker?
- Does the patient have any pre-existing health conditions?
- Did the patient spend any nights away from home?
- Did the patient use respiratory therapy equipment?
- Did the patient stay at an assisted living or senior facility? Include location address, type of facility, and date of exposure
- Did the patient visit a gym or spa? (i.e., locker rooms, steam room, shower)
- Did the patient stay at a healthcare facility? Include location address, type of facility, and date of exposure.
- Did the patient have any exposure to construction or plumbing projects?

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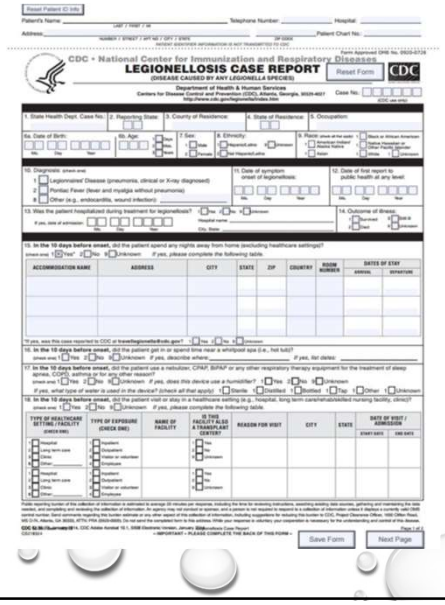
Single Case Investigation Tools

- **A CDC Case Report Form**
  - Serve as a guide for what information to obtain for each investigated case
  - https://www.cdc.gov/Legionella/downloads/case-report-form.pdf
- **Legionnaires' Disease Cruise Ship Questionnaire Template**
  - Collect additional exposure data for cases that may be associated with a cruise ship
  - https://www.cdc.gov/legionella/downloads/template-cruise-ship-questionnaire.pdf
- **Legionnaires' Disease Hypothesis-Generating Questionnaire Template**
  - Collect additional information about possible exposure to detect an outbreak
  - https://www.cdc.gov/legionella/downloads/template-hypothesis-generating-questionnaire-508.pdf


CDC • National Center for Immunization and Respiratory Diseases

LEGIONELLOSIS CASE REPORT

(DISEASE CAUSED BY ANY LEGIONELLA SPECIES)

Department of Health & Human Services

Centers for Disease Control and Prevention (CDC), Atlanta, Georgia, 30329-4027

Reset Form

CDC

Save Form

Next Page

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Single Case Investigation Checklist

CDRSS Field Completion Checklist		
Disease Information	☐ Illness onset date	☐ Date reported to state or local health department
Patient Personal Information	☐ First and last name ☐ Gender	☐ Date of birth ☐ Race and ethnicity
Addresses	☐ Street ☐ City ☐ State	☐ County ☐ Municipality ☐ Phone number
Laboratory Information	☐ Test ☐ Specimen ☐ Lab name	☐ Date specimen collected ☐ Value and/or result
Diagnostic Information (e.g., CXR, CT Scan)	☐ Test name ☐ Findings ☐ Test result data (e.g., pneumonia, infiltrate, consolidation)	☐ Test date ☐ Medical facility
Clinical Status	☐ Date of initial health care evaluation ☐ As part of this investigation, was patient hospitalized?	☐ Patient died?
Legionellosis Risk Factors	Entire section should be completed	
Medical Facility and Provider Information	☐ Medical facility name ☐ Patient status	☐ Dates of hospitalization ☐ Medical facility type
Signs and Symptoms	Entire section should be completed	
Treatment Information*	☐ Treatment ☐ Dose	☐ Start date
***This section is not mandatory, but preferred when determining the illness onset date for patients with complex medical histories.**		

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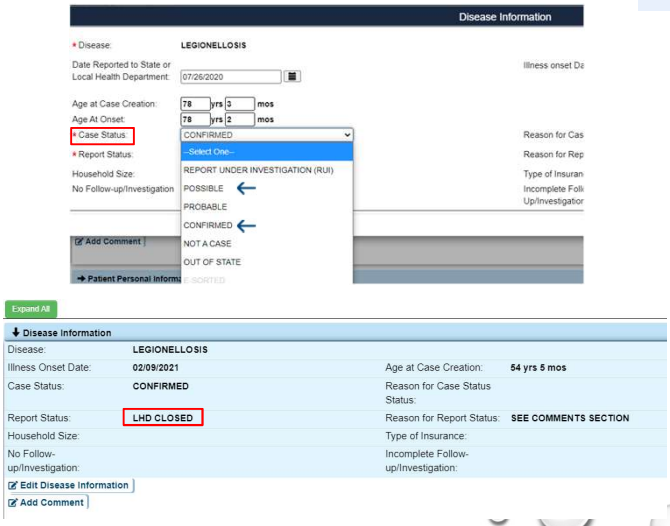
Case Status & Report Status

Case Status
- Confirmed
- Suspect= Possible

Report Status
- LHD Closed



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Single Case Considerations

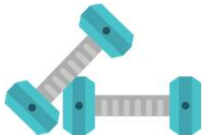
Notify the NJDOH by phone/email when these exposures are identified

Travel- Associated Case

Healthcare- Associated Case

Congregate Living- Associated Case

Assisted Living- Associated Case



Gym/Spa- Associated Case

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Single Case Notifications

- LHD in the jurisdiction of the facility **must notify** the facility of the case (i.e., guest, resident, patient) with a notification letter for specific exposures:

Travel-Associated Legionellosis Case

- A single case reports staying at a travel accommodation at least one night during their incubation period.

Healthcare-Associated Case

- A single case reports spending only part of their incubation period at a healthcare facility.

Apartment Building- Associated Case

- A single case reports living in an apartment building at an increased risk for *Legionella* growth.

Assisted Living- Associated Case

- A single case reports spending only part of their incubation period at the assisted living facility.

Gym/Spa Associated Case

- A single case reports visiting a gym or spa during their incubation period.

[Insert date]

Dear Hotel Management:

On [date], [local health department] was notified that a recent guest of your hotel has been diagnosed with Legionnaires' disease. Legionnaires' disease is a very serious type of pneumonia (lung infection) caused by bacteria called *Legionella*. People can get Legionnaires' disease when they breathe in small droplets of water in the air that contain the bacteria. Hotel spas, whirlpools, showers, and cooling towers have previously been shown to be sources of Legionnaires' disease outbreaks. If a second guest of your hotel develops Legionnaires' disease within 12-months of the first guest, a full public health and environmental investigation will be warranted in your facility. We are providing this letter to you for your information only.

Legionella bacteria are common in the environment and can persist unless proper steps are taken to prevent the growth of bacteria. Please take this opportunity to review your water maintenance procedures to help minimize future risk. The following resources may be helpful:

- The American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Guideline 12-2020 "Minimizing the Risk of Legionellosis Associated with Building Water Systems." This document is available at www.ashrae.org.
- The American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Standard 188-2015 "Legionellosis: Risk Management for Building Water Systems." This document is available at www.ashrae.org.
- The Centers for Disease Control and Prevention Toolkit "Developing a Water Management Program to Reduce *Legionella* Growth and Spread in Buildings." This toolkit is available at https://www.cdc.gov/legionella/wmp/toolkit/index.html.

It is possible that other guests will contact you if they were diagnosed with Legionnaires' disease after a stay at your hotel. Please inform [LHD name] immediately if you learn of other potential Legionnaires' disease diagnoses among guest, staff, or visitors associated with your hotel.

If you have any questions regarding this notice, please do not hesitate to contact [name and contact details for LHD]. Thank you for your time and attention.

Sincerely,

[LHD POC name and contact details]

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Outbreak/ Full Investigation Steps

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Do I initiate a full outbreak investigation?

Positive lab results sent to CDRSS.

Culture UAT Serology PCR

Local Health Department conducts single case investigation.

- ✓ **Illness Onset**
- ✓ **Demographics**
- ✓ **Risk Factors & Potential Exposures**
- ✓ **Hospitalization**
- ✓ **Laboratory and Diagnostic Tests**
- ✓ **Signs & Symptoms**

- Healthcare exposure?
- Travel-associated exposure?
- More than one case associated with a single facility?
- Time spent (during incubation period) at a confined facility?

✓ YES

✗ NO

✓ **Further Investigation**

✗ **Case is Closed**
- Case Status= Confirmed or Suspect
- Report Status= LHD Closed

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What warrants a full investigation?

Non-Healthcare Facilities (i.e., apartment complex, school, casino)

- Two or more cases of legionellosis who report the same common exposure within a 12-month period.
- Three or more cases of legionellosis who report the same common exposure regardless of time frame.

Healthcare Facilities (i.e., hospital, long-term care, clinics)

- A case with ≥ 10 days of continuous stay at a healthcare facility during the 14 days before onset of symptoms (*presumptive healthcare-associated LD).
- Two or more possible healthcare-associated legionellosis cases within a 12-month period
- Three or more possible healthcare-associated legionellosis cases regardless of time frame.

Travel-Associated Outbreak (i.e., motel, hotel, Airbnb)

- Two or more cases of legionellosis in people who stayed overnight in the same accommodation during the exposure period AND had symptom onsets within 12 months of each other.
- Three or more travel-associated legionellosis cases regardless of time frame.

Confined Facilities (i.e., assisted living, correctional facility, group home)

- One case of legionellosis who spent all nights of their incubation period in this setting.
- Two or more legionellosis cases who spent at least one night of their incubation period in this setting within a 12-month period.
- Three or more cases of legionellosis who spent at least one night of their incubation period in this setting regardless of time frame.

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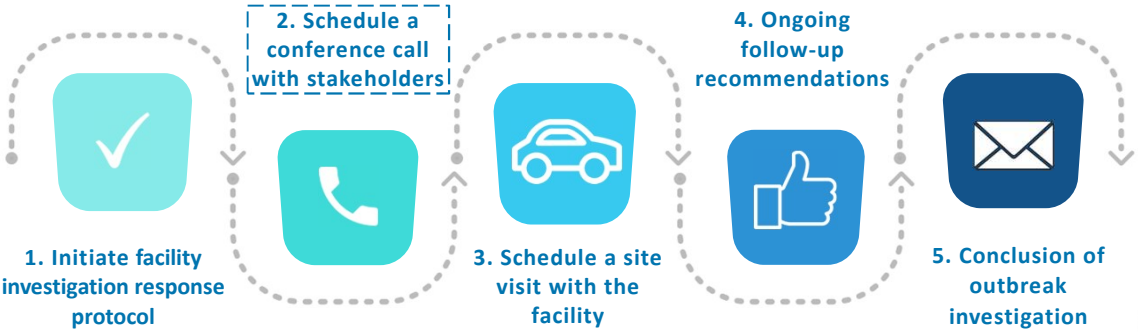
Outbreak/ Full Investigation Steps



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Schedule a Conference Call

- Coordinate a call with appropriate stakeholders
  - **Facility**: Administrator, Management, Infection Preventionist, Building Maintenance Employee
  - **LHD**: Health Officer, Disease Investigator, Public Health Nurse, REHS
  - **NJDOH**: *Legionella* Team
- Review ***Legionella* Background**
- Conduct a **clinical assessment**
- Conduct an **environmental assessment** (*send to the facility prior to the call*)
- Provide **initial recommendations**

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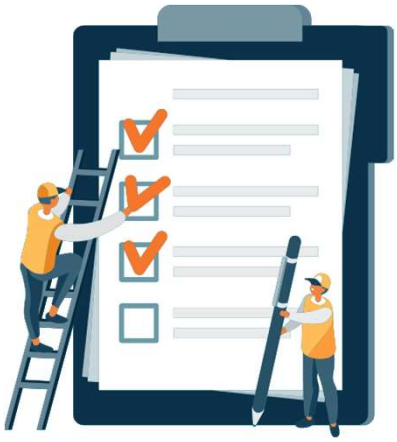
Environmental Assessment



1 Facility Characteristics

- Original purpose of building
- Number of floors
- Current census
- Total number of rooms
- Total number of bathrooms

2 Source Water

- Source of water used by facility
- Documented water disruptions
- Incoming water quality parameters

3 Potable Water System

- Supplemental disinfection
- Cisterns/ water storage tanks
- Hot water tanks
- Thermostatic mixing valves
- Recirculation loop

4 Water System Devices

- Emergency water systems
- Cooling towers
- Whirlpool spas/ hot tubs/ hydrotherapy tubs
- Decorative fountains
- Ice machines

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Initial Recommendations

Hire a third-party consultant who has experience with *Legionella and* large water systems.

Schedule a site visit in conjunction with the facility, LHD, and NJDOH.

Collect 1-liter bulk water samples for *Legionella* culture to be analyzed at a CDC Elite Member Laboratory.

Establish and implement a Water Management Program (WMP)

Maintain water temperature of all domestic hot water storage tanks at a minimum of 140° F to prevent *Legionella* growth.

Flush water at outlets (e.g., sinks, showers, and tubs) not in routine use or which experience low water flow at least once per week.

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Initial Recommendations

Adhere to manufacturer's instructions regarding maintenance, disinfection, and/or sterilization of all respiratory equipment and devices.

Provide bottled drinking water and avoid use of ice or tap water in food or drink for any residents at risk of aspiration.

Conduct active clinical surveillance to identify residents with new onset pneumonia (pneumonia with onset ≥48 hours after admission).

Consider installing 0.2-micro biological point-of-use (POU) filters on any showerheads intended for use or restrict showers and use sponge baths instead.

Plan to perform an emergency chemical shock remediation of the building's potable hot water lines.

Assess the efficacy of the emergency remediation by collecting samples 3 to 7 days post-remediation and then at 2-week intervals for 3 months.

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Outbreak/ Full Investigation Steps

1. Initiate facility investigation response protocol

2. Schedule a conference call with stakeholders

3. Conduct a site visit with the facility

4. Ongoing follow-up recommendations

5. Conclusion of outbreak investigation

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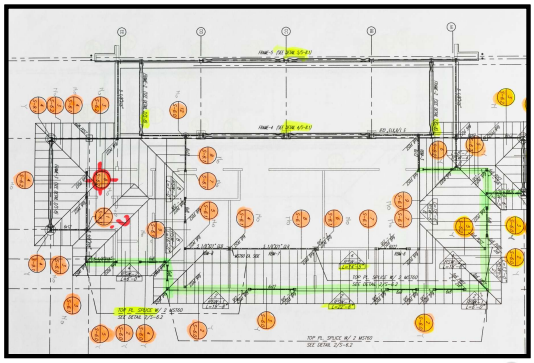
Conduct a Site Visit

- Goals:
  - ✓ **Review** blueprints and take inventory of water system components.
  - ✓ **Conduct** a walk through of the facility to confirm what was provided on the environmental assessment.
  - ✓ **Establish** a sampling plan in conjunction with the consultant, LHD, and NJDOH.
    - 10% of facility outlets
      - Case-patient room and outlets not in routine use / unoccupied
    - Incoming water, hot water tanks (at or near the bottom), hot water return line(s), expansion tanks, and ice machines.



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Outbreak/ Full Investigation Steps

1. Initiate facility investigation response protocol

2. Schedule a conference call with stakeholders

3. Schedule a site visit with the facility

4. Ongoing follow-up recommendations

5. Conclusion of outbreak investigation

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Follow-Up Recommendations

If *Legionella* species are not detected in culture during 3 months of monitoring at 2-week intervals, collect cultures monthly for another 3 months.

Install 0.2-micro biological point-of-use (POU) filters on any showerheads intended for use or restrict showers and use sponge baths instead.

Perform an emergency chemical shock remediation of the building's potable hot water lines.

Notify residents, staff, and/or visitors of implemented water restrictions (e.g., installation of point-of-use filters, use of bottled water, chemical shock remediation).

Consider installing supplemental disinfection to treat the building water system.

Continue to assess the efficacy of the emergency remediation by collecting samples 3 to 7 days post-remediation and then at 2-week intervals for 3 months.

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Outbreak/ Full Investigation Steps

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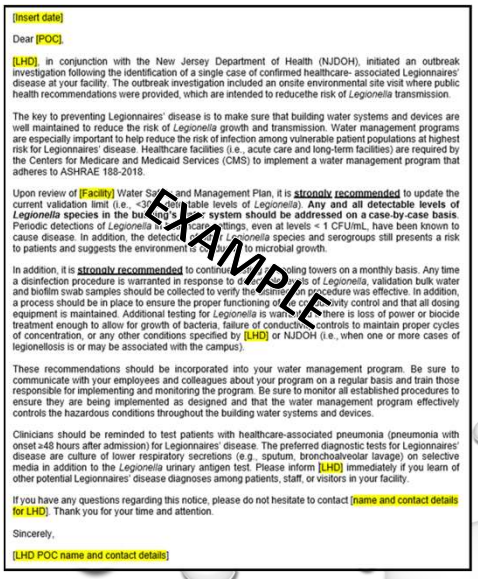
Conclusion of Outbreak Investigation

- When to conclude an outbreak investigation:
  - ✓ Facility has corrected all deficiencies
  - ✓ Building water system has been maintained throughout the monitoring period
- Goals:
  - ✓ **Document** the conclusion of the outbreak investigation (i.e., close out letter)
  - ✓ **Recommend** best practices tailored to the facility's deficiencies
  - ✓ **Provide** educational resources



[Insert date]

Dear [POC],

[LHD], in conjunction with the New Jersey Department of Health (NJDOH), initiated an outbreak investigation following the identification of a single case of confirmed healthcare- associated Legionnaires' disease at your facility. The outbreak investigation included an onsite environmental site visit where public health recommendations were provided, which are intended to reducethe risk of *Legionella* transmission.

The key to preventing Legionnaires' disease is to make sure that building water systems and devices are well maintained to reduce the risk of *Legionella* growth and transmission. Water management programs are especially important to help reduce the risk of infection among vulnerable patient populations at highest risk for Legionnaires' disease. Healthcare facilities (i.e., acute care and long-term facilities) are required by the Centers for Medicare and Medicaid Services (CMS) to implement a water management program that adheres to ASHRAE 188-2018.

Upon review of [Facility] Water Safety and Management Plan, it is **strongly recommended** to update the current validation limit (i.e., <3 CFU/mL detectable levels of *Legionella*). **Any and all detectable levels of *Legionella* species in the building water system should be addressed on a case-by-case basis.** Periodic detections of *Legionella* in healthcare settings, even at levels < 1 CFU/mL, have been known to cause disease. In addition, the detection of *Legionella* species and serogroups still presents a risk to patients and suggests the environment is conducive to microbial growth.

In addition, it is **strongly recommended** to continue monitoring cooling towers on a monthly basis. Any time a disinfection procedure is warranted in response to detection of levels of *Legionella*, validation bulk water and biofilm swab samples should be collected to verify the disinfection procedure was effective. In addition, a process should be in place to ensure the proper functioning of conductivity control and that all dosing equipment is maintained. Additional testing for *Legionella* is warranted if there is loss of power or biocide treatment enough to allow for growth of bacteria, failure of conductivity controls to maintain proper cycles of concentration, or any other conditions specified by [LHD] or NJDOH (i.e., when one or more cases of legionellosis is or may be associated with the campus).

These recommendations should be incorporated into your water management program. Be sure to communicate with your employees and colleagues about your program on a regular basis and train those responsible for implementing and monitoring the program. Be sure to monitor all established procedures to ensure they are being implemented as designed and that the water management program effectively controls the hazardous conditions throughout the building water systems and devices.

Clinicians should be reminded to test patients with healthcare-associated pneumonia (pneumonia with onset ≥48 hours after admission) for Legionnaires' disease. The preferred diagnostic tests for Legionnaires' disease are culture of lower respiratory secretions (e.g., sputum, bronchoalveolar lavage) on selective media in addition to the *Legionella* urinary antigen test. Please inform [LHD] immediately if you learn of other potential Legionnaires' disease diagnoses among patients, staff, or visitors in your facility.

If you have any questions regarding this notice, please do not hesitate to contact [name and contact details for LHD]. Thank you for your time and attention.

Sincerely,

[LHD POC name and contact details]

EXAMPLE

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Resources

- Toolkit for Controlling Legionella in Common Sources of Exposure: https://www.cdc.gov/legionella/wmp/control-toolkit/index.html
- Toolkit: Developing a Water Management Program to Reduce Legionella Growth and Spread in Buildings: https://www.cdc.gov/legionella/wmp/toolkit/index.html
- Legionella Environmental Assessment Form: https://www.cdc.gov/legionella/downloads/legionella-environmental-assessment.pdf
- PreventLD Training: https://www.cdc.gov/nceh/ehs/elearn/prevent-LD-training.html
- ASHRAE Guideline 12-2020: https://www.ashrae.org/technical-resources/ashrae-standards-and-guidelines
- New Jersey Department of Health Educational Materials: https://www.nj.gov/health/cd/topics/legion.shtml

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Key Takeaways

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Questions and Contact Information

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