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TO: Healthcare Providers, Healthcare Facilities, Clinical Laboratories, and Local Health Departments (LHDs)

FROM: New York State Department of Health (NYSDOH)
New York City Department of Health and Mental Hygiene (NYC Health Department)

HEALTH ADVISORY: LEGIONELLOSIS

For All Clinical Staff in Internal Medicine, Pulmonary and Intensive Care Medicine, Geriatrics, Primary Care, Infectious Diseases, Emergency Medicine, Family Medicine, Laboratory Medicine, and Infection Control/Epidemiology

SUMMARY

- New York State (NYS) has a high burden of legionellosis. Clinical suspicion for the possibility of Legionnaires' disease, Pontiac fever, or extrapulmonary legionellosis coupled with culture of respiratory secretions is critical to the identification of and intervention in community clusters.
- Legionellosis occurs year-round, with increased incidence during the summer and early fall.
- Legionnaires' disease cannot be distinguished from other causes of pneumonia on clinical or radiologic grounds and requires diagnostic testing in hospitalized or at-risk patients with suspected pneumonia. **Clinicians should test for *Legionella* by respiratory culture, PCR, and urine antigen, especially if testing for other respiratory infections has been negative.** A single serology is not appropriate for the diagnosis of acute legionellosis. Please refer to the following diagnostic testing table for additional information.
- **Culture of the organism from respiratory secretions or tissues is the gold standard for Legionnaires' disease diagnosis and is the only way to identify and link clinical case(s) to a potential environmental source.** You must specifically request a culture for *Legionella* because this testing requires specialized media.
- **Confirmed *Legionella* isolates from any clinical specimen[1] should be submitted to the NYS Department of Health (DOH) Wadsworth Center Laboratories or the New York City (NYC) Public Health Laboratory (PHL) for serogrouping and whole genome sequencing (WGS).**
- Report legionellosis cases promptly to the local health department (LHD)[2] where the patient resides. Cases in NYC residents should be reported to the NYC Health Department by calling the Provider Access Line at 866.692.3641.
    - If you are unable to reach the LHD, contact the NYSDOH BCDC at 518.473.4439 or by email at epiLegionella@health.ny.gov during business hours or 866.881.2809 evenings, weekends, and holidays.

[1] https://www.wadsworth.org/sites/default/files/WebDoc/CDRG%20NYState%202020_101920%202.pdf
[2] https://www.health.ny.gov/contact/contact_information/

Epidemiology

From 2019-2023, there were 4,359 legionellosis cases reported statewide. In 2021, NYS reported more cases of legionellosis than any other state.[3] In 2023, 18 community-acquired and 23 facility-related clusters or outbreaks were investigated in NYS, including NYC. The statewide incidence rate was 4.1 cases per 100,000 population, with the highest burden in residents of counties located in Western and Central New York. The national case-fatality rate is estimated to be 10% for community-acquired and 25% for healthcare-acquired Legionnaires' disease.[4]

Information for Healthcare Providers, Facilities, and Clinical Laboratories

Clinical suspicion of Legionnaires' disease should be elevated for such persons presenting with pneumonia especially if they report recent travel, recent inpatient care at a healthcare facility, recent exposure to hot tubs, or if the patient lives in a congregate setting such as a nursing home.

Testing for Legionnaires' disease guides clinical treatment and assists LHDs and NYS with detecting outbreaks and linking cases to potential environmental sources. Testing is critical for persons at higher risk for Legionnaires' disease, including persons aged 50 years or older; current or former smokers; persons with chronic lung disease, immunocompromising conditions, systemic malignancy, or comorbid conditions such as diabetes or renal/hepatic failure.

Respiratory tract specimens for *Legionella* culture should ideally be obtained before initiation of antibiotics, although antibiotics should not be delayed in order to obtain a specimen. Cultures can be ordered after the initiation of antibiotics.

Empiric treatment of community-acquired pneumonia in hospitalized patients should include adequate coverage for *Legionella* with either a macrolide (e.g., azithromycin) or a respiratory fluoroquinolone (e.g., levofloxacin). The CDC provides detailed information on clinical guidance and treatment regimens for Legionella infections.[5]

Pontiac fever is a less severe illness than Legionnaires' disease. Symptoms include fever and muscle aches; however, Pontiac fever does not present with pneumonia. Symptoms can begin within a few hours to 3 days after exposure to the bacteria, usually lasts less than a week, and patients typically do not require treatment.

Extrapulmonary legionellosis, although rare, has been identified as the cause of clinical infections as diverse as endocarditis, wound infections, joint infections, and graft infections, among others. A diagnosis of extrapulmonary legionellosis is made when there is clinical evidence of disease and diagnostic testing indicates evidence of *Legionella* at an extrapulmonary site.

Additional information, including detailed clinical guidance for *Legionella* infections, is available at the Centers for Disease and Control and Prevention's Resource Site.[6]

[3] https://wonder.cdc.gov/nndss/static/2021/annual/2021-table2i.html
[4] https://www.cdc.gov/investigate-legionella/php/healthcare-resources/testing-collecting-specimens.html?CDC_AAref_Val=https://www.cdc.gov/legionella/health-depts/healthcare-resources/cases-outbreaks.html
[5] https://www.cdc.gov/legionella/hcp/clinical-guidance/index.html
[6] https://www.cdc.gov/legionella/index.html

Diagnostic Testing

Test	Specimen Type	Advantages	Challenges
Culture (gold standard)	• Lower respiratory secretions (sputum) • Tissue	• Provides confirmatory lab evidence of Legionnaires' disease. • Detects ALL species and serogroups. • WGS can be conducted. • Comparison of clinical and environmental isolates to identify potential source.	• Clinicians must specifically request the specimen be cultured for Legionella (not a general respiratory bacterial culture) as specialized media (buffered charcoal yeast extract {BCYE} agar) is required. to ensure culture viability (e.g., pure colony isolates streaked on sealed BYCE agar plates or slants incubated for no more than 14 days and sent with cold packs or ice, but not frozen).
Polymerase chain reaction (PCR)	• Lower respiratory secretions (sputum) • Tissue	• Provides confirmatory lab evidence of Legionnaires' disease. • Detects *L. pneumophila* serogroup 1 as well as other species and serogroups.	• Must be reflexed to culture to perform WGS for comparison to environmental isolates to identify potential source of infection in outbreaks.
Urine antigen testing (UAT)	• Urine	• Provides confirmatory lab evidence of Legionnaires' disease. • ONLY reliably detects *L. pneumophila* serogroup 1.	• Cannot identify or rule out infection with other *Legionella* species/ serogroups. • Cannot be used for WGS. • Cannot be used to identify potential environmental source of infection in outbreaks.
Serology	• Blood	• Can diagnose acute Legionnaires' disease infection retrospectively.	• A single antibody titer is NOT diagnostic for legionellosis. • Requires collection of second specimen, 3–4 weeks apart, to detect a fourfold rise in antibody titer to a level >1:128. • Cannot be used to identify potential environmental source of infection in outbreaks.

Public Health Reporting

- Report cases promptly to the LHD[2] where the patient resides[7]. Cases residing in NYC should be reported to the NYC Health Department by calling the Provider Access Line at 866.692.3641 during business hours or 212.764.7667 evenings, weekends, and holidays.
- If you are unable to reach the LHD for cases residing outside of NYC, contact the NYSDOH Bureau of Communicable Disease Control (BCDC) at 518.473.4439 during business hours or 866.881.2809 evenings, weekends, and holidays.
- Laboratories should send all *Legionella* isolates to the appropriate PHL for serotyping and WGS as outlined in the NYS Laboratory Reporting of Communicable Diseases[1].
  - Cases in residents outside of NYC: isolates should be sent to the NYS Wadsworth Center Bacteriology Laboratory.[8]
  - Cases in residents of NYC: isolates should be sent to the NYC PHL using PHL eOrder. Select *Legionella* serotyping and send isolates to 455 1st Avenue, New York, NY 10016.

Questions regarding clinical or epidemiological information should be directed to your LHD or the NYSDOH BCDC at 518.473.4439 or epiLegionella@health.ny.gov. For questions pertaining to NYC residents, call the NYC Health Department Provider Access Line at 866.692.3641.

[7] https://www.health.ny.gov/professionals/diseases/reporting/communicable/
[8] https://www.wadsworth.org/programs/id/bacteriology/submission-guidelines