09-ID-45

Committee: Infectious

Title: **Public Health Reporting and National Notification for Legionellosis**

I. Statement of the Problem

CSTE position statement 07-EC-02 recognized the need to develop an official list of nationally notifiable conditions and a standardized reporting definition for each condition on the official list. The position statement also specified that each definition had to comply with American Health Information Community recommended standards to support "automated case reporting from electronic health records or other clinical care information systems." In July 2008, CSTE identified sixty-eight conditions warranting inclusion on the official list, each of which now requires a standardized reporting definition.

II. Background and Justification

Background[1]

Legionellosis is caused by various species of *Legionella* bacteria, and has two distinct clinical forms: Legionnaires' disease, which is characterized by fever, myalgia, cough, and clinical or radiographic pneumonia; and Pontiac fever, a milder illness without pneumonia. Legionnaires' disease is a common cause of severe pneumonia, and an estimated 8,000-18,000 hospitalized cases occur each year in the U.S. The majority of reported cases are sporadic. Outbreaks can occur in almost any setting, but are most frequently reported in association with travel and healthcare exposure. *Legionella* can be found in natural, freshwater environments, but they are present in insufficient numbers to cause disease. Potable (drinking) water systems, whirlpool spas, and cooling towers are examples of water sources that can promote *Legionella* transmission via water aerosolization, and are, therefore, common sources of outbreaks. Urinary antigen assay and culture of respiratory secretions on selective media are the preferred diagnostic tests for Legionnaires' disease.

Justification

Legionellosis meets the following criteria for a nationally and **standard** notifiable condition, as specified in CSTE position statement 08-EC-02:

- A majority of state and territorial jurisdictions—or jurisdictions comprising a majority of the US population—have laws or regulations requiring **standard** reporting of legionellosis to public health authorities
- CDC requests **standard** notification of legionellosis to federal authorities
- CDC has condition-specific policies and practices concerning the agency's response to, and use of, notifications.

[1] Much of the material in the background is quoted directly from the CDC Legionellosis Resource Website. See the References for further information on these source documents.

III. Statement of the desired action(s) to be taken

CSTE requests that CDC adopt this standardized reporting definition for legionellosis to facilitate more timely, complete, and standardized local and national reporting of this condition.

IV. Goals of Surveillance

To provide information on the temporal, geographic, and demographic occurrence of legionellosis to facilitate its prevention and control.

V. Methods for Surveillance

Surveillance for legionellosis should use the sources of data and the extent of coverage listed in Table V below.

Table V. Recommended sources of data and extent of coverage for ascertaining cases of legionellosis.

	Coverage	
Source of data for case ascertainment	Population-wide	Sentinel sites
clinician reporting	x	
laboratory reporting	x	
reporting by other entities (e.g., hospitals, veterinarians, pharmacies)	x	
death certificates	x	
hospital discharge or outpatient records	x	
extracts from electronic medical records	x	
telephone survey		
school-based survey		
other _____		

VI. Criteria for Reporting

Reporting refers to the process of healthcare providers or institutions (e.g., clinicians, clinical laboratories, hospitals) submitting basic information to governmental public health agencies about cases of illness that meet certain reporting requirements or criteria. Cases of illness may also be ascertained by the secondary analysis of administrative health data or clinical data. The purpose of this section is to provide those criteria that should be used by humans and machines to determine whether a specific illness should be reported.[2]

[2] "Human-based" criteria (described below under "A. Narrative") can be applied by medical care providers and laboratory staff based on clinical judgment and clinical diagnosis. Machine-based criteria (described below under

A. Narrative description of criteria to determine whether a case should be reported to public health authorities

Report any illness presenting with fever, myalgia, cough, *or* pneumonia to public health authorities that meets *any* of the following laboratory criteria:

- isolation of any *Legionella* organism from respiratory secretions, lung tissue, pleural fluid, or other normally sterile fluid
- detection of *Legionella pneumophila* serogroup 1 antigen in urine
- fourfold or greater rise in specific serum antibody titer between acute and convalescent specimens to *Legionella pneumophila* serogroup 1
- fourfold or greater rise in antibody titer between acute and convalescent specimens 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 between acute and convalescent specimens to multiple species of *Legionella* using pooled antigen and validated reagents
- detection of specific *Legionella* antigen or staining of the organism in respiratory secretions, lung tissue, or pleural fluid by direct fluorescent antibody (DFA)
- detection of specific *Legionella* antigen or staining of the organism in respiratory secretions, lung tissue, or pleural fluid by immunohistochemstry (IHC)
- detection of *Legionella* species by a validated nucleic acid assay

Report any person whose healthcare record contains a diagnosis of legionellosis.

Report any person whose death certificate lists legionellosis as a cause of death or a significant condition contributing to death.

Other recommended reporting procedures

- All cases of legionellosis (travel-associated and not travel-associated) should be reported.
- Reporting should be on-going and routine.
- Frequency of reporting should follow the state health department's routine schedule.

"B. Table") can be applied using computerized algorithms that operate in electronic health record systems, including computerized records of laboratory test orders and laboratory test results; other clinical data systems (e.g., hospital discharge data systems serving multiple hospitals); or administrative data (e.g., healthcare provider billing data, vital records, and EMS data).

B. Table of criteria to determine whether a case should be reported to public health authorities

Table VI-B. Proposed Table of criteria to determine whether a case should be reported to public health authorities. Note: The following criteria are proposed for evaluation before general implementation. For purposes of currently implementing reporting the narrative description in VI-A, should be used.

Criterion	Reporting
Clinical Presentation	
fever	O
myalgia	O
cough	O
pneumonia	O
healthcare record contains a diagnosis of legionellosis	O
death certificate lists legionellosis as a cause of death or a significant condition contributing to death	O
Laboratory findings	
isolation of any *Legionella* organism from respiratory secretions, lung tissue, pleural fluid, or other normally sterile fluid	O
detection of *Legionella pneumophila* serogroup 1 antigen in urine	O
fourfold or greater rise in antibody titer between acute and convalescent specimens to *Legionella pneumophila* serogroup 1 using validated reagents	O
fourfold or greater rise in antibody titer between acute and convalescent specimens to specific species or serogroups of *Legionella* other than *L. pneumophila* serogroup 1 (e.g., *L. micdadei*, *L. pneumophila* serogroup 6).	O
fourfold or greater rise in antibody titer between acute and convalescent specimens to multiple species of *Legionella* using pooled antigen and validated reagents	O
detection of specific *Legionella* antigen or staining of the organism in respiratory secretions, lung tissue, or pleural fluid by direct fluorescent antibody (DFA)	O
detection of specific *Legionella* antigen or staining of the organism in respiratory secretions, lung tissue, or pleural fluid by immunohistochemstry (IHC)	O
detection of *Legionella* species by a validated nucleic acid assay	O

Notes:
O = At least one of any "O" criteria in each category (e.g., clinical presentation and laboratory findings) is required to report a case.

C. Disease Specific Data Elements:

Disease-specific data elements to be included in the initial report are listed below.

Group	Element
Sources of exposure	Within the two weeks before onset of illness, did the patient • travel or stay overnight somewhere other than usual residence o if yes, location and dates of travel • visit a hospital as an outpatient • work in a hospital Within the two weeks before onset of illness, was the patient exposed to a healthcare setting? Is the patient's illness associated with an outbreak?
Illness	Was patient hospitalized for Legionellosis? Hospital name Hospital address Outcome • survived • died • unknown

VII. Case Definition for Case Classification

A. Narrative description of criteria to determine whether a case should be classified as confirmed or suspected (possible):

Clinical description

Legionellosis is associated with two clinically and epidemiologically distinct illnesses: Legionnaires' disease, which is characterized by fever, myalgia, cough, and clinical or radiographic pneumonia; and Pontiac fever, a milder illness without pneumonia.

Laboratory criteria for diagnosis:

Suspect:

- By seroconversion: 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).
- By seroconversion: fourfold or greater rise in antibody titer to multiple species of *Legionella* using pooled antigen and validated reagents.
- By the detection of specific *Legionella* antigen or staining of the organism in respiratory secretions, lung tissue, or pleural fluid by direct fluorescent antibody (DFA) staining, immunohistochemstry (IHC), or other similar method, using validated reagents.
- By detection of *Legionella* species by a validated nucleic acid assay.

Confirmed:

- By culture: isolation of any *Legionella* organism from respiratory secretions, lung tissue, pleural fluid, or other normally sterile fluid.
- By detection of *Legionella pneumophila* serogroup 1 antigen in urine using validated reagents.
- By seroconversion: fourfold or greater rise in specific serum antibody titer to *Legionella pneumophila* serogroup 1 using validated reagents.

Case classification

Suspect: a clinically compatible case that meets at least one of the presumptive (suspect) laboratory criteria.

Travel-associated: a case that has a history of spending at least one night away from home, either in the same country of residence or abroad, in the ten days before onset of illness.

Confirmed: a clinically compatible case that meets at least one of the confirmatory laboratory criteria.

Travel-associated: a case that has a history of spending at least one night away from home, either in the same country of residence or abroad, in the ten days before onset of illness.

B. Classification Tables

Table VII-B lists the criteria that must be met for a case to be classified as confirmed or suspected (possible).

Table VII-B. Proposed table of criteria to determine whether a case is classified. Note: The following criteria are proposed for evaluation before general implementation. For purposes of current notification, the narrative description in VII-A, should be used.

	Case Definition	
Criterion	Confirmed	Suspected
Clinical Presentation		
fever	O	O
myalgia	O	O
cough	O	O
pneumonia	O	O

Criterion	Case Definition	
	Confirmed	Suspected
Laboratory findings		
isolation of any *Legionella* organism from respiratory secretions, lung tissue, pleural fluid, or other normally sterile fluid	O	
detection of *Legionella pneumophila* serogroup 1 antigen in urine	O	
fourfold or greater rise in antibody titer between acute and convalescent specimens to *Legionella pneumophila* serogroup 1 using validated reagents	O	
fourfold or greater rise in antibody titer between acute and convalescent specimens to specific species or serogroups of *Legionella* other than *L. pneumophila* serogroup 1 (e.g., *L. micdadei*, *L. pneumophila* serogroup 6).		O
fourfold or greater rise in antibody titer between acute and convalescent specimens to multiple species of *Legionella* using pooled antigen and validated reagents		O
detection of specific *Legionella* antigen or staining of the organism in respiratory secretions, lung tissue, or pleural fluid by direct fluorescent antibody (DFA)		O
detection of specific *Legionella* antigen or staining of the organism in respiratory secretions, lung tissue, or pleural fluid by immunohistochemstry (IHC)		O
detection of *Legionella* species by a validated nucleic acid assay		O
Epidemiological risk factors		
history of spending at least one night away from home, either in the same country of residence or abroad, in the ten days before onset of illness	C	C
history of healthcare exposure	C	C
exposure to whirlpool spas	C	C
recent repairs or maintenance work on domestic plumbing	C	C

Notes:
O = At least one of any "O" criteria in each category (e.g., clinical presentation and laboratory findings) in the same column is required to classify a case.
C = This finding corroborates (i.e., supports) the diagnosis of—or is associated with—legionellosis, but is not included in the case definition.

VIII. Period of Surveillance

Surveillance should be on-going.

IX. Data sharing/release and print criteria

Notification to CDC for confirmed and suspected cases of legionellosis is recommended.

Electronic reports of NNDSS legionellosis cases are summarized weekly in MMWR Tables 1 and 2. Annual case data on legionellosis is also summarized in the yearly MMWR Summary of Notifiable Disease. All cases are verified with the state(s) before publication. Additionally, CDC will provide legionellosis surveillance reports as needed to reflect current epidemiologic situations at national and local levels. These publications may include manuscripts in peer-reviewed journals.

A second surveillance system for legionellosis is maintained by the Respiratory Disease Branch (RDB) at CDC. Via a case report form, this system collects extended information on legionellosis cases such as method of diagnosis and exposures. In an effort to increase case reports to the RDB system, an annual analysis is completed for, and sent to, each state to describe the information reported by both the NNDSS and RDB surveillance systems.

The re-release of this data is provided on an as-needed basis following the NNDSS data release guidelines. Personal identifying information is not transmitted to any party.

X. References

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