

Committee: Infectious

Title: Public Health Reporting and National Notification for Trichinellosis

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 definition for reporting 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

Trichinellosis, previously known as trichinosis, is caused by eating raw or undercooked meat of animals infected with the larvae of a genus of roundworm called *Trichinella*. Infection occurs in certain wild animals, mostly omnivores, but may also occur in domestic pigs.

Nausea, diarrhea, vomiting, fatigue, fever, constipation, and abdominal discomfort are the first symptoms of trichinellosis in humans, which correspond to the enteral phase of acute illness, in which the ingested *Trichinella* larvae invade the intestinal mucosa. The enteral phase symptoms can occur 1-2 days after infection and usually last from 2-7 days, but they can persist for weeks. Headaches, fevers, chills, cough, eye swelling, aching joints and muscle pains, itchy skin, or continued gastrointestinal symptoms follow the first symptoms and correspond to the parenteral phase of acute illness, in which muscle invasion by the larval parasites stimulates inflammatory and allergic responses.

The entire acute phase can last one to eight weeks, but can also be asymptomatic, especially if the number of infective larvae ingested is low. If the infection is heavy, patients may experience difficulty coordinating movements, and have heart and breathing problems due to larvae invading the heart or lung tissue, respectively. In severe cases, death can occur. For mild to moderate infections, most symptoms subside within a few months. Often, mild cases of trichinellosis are not specifically diagnosed. The suspicion of trichinellosis, based on clinical symptoms and eosinophilia, can be confirmed by specific diagnostic tests, including antibody detection, muscle biopsy and microscopy of tissue collected by biopsy.

¹ Much of the material in the background is directly quoted from the CDC’s Trichinellosis Website. See the References for further information on this source.

Justification

Trichinellosis 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 trichinellosis to public health authorities
- CDC requests **standard** notification of trichinellosis to federal authorities
- CDC has condition-specific policies and practices concerning the agency's response to, and use of, notifications. NNDSS data will be added to the CDC's database of trichinellosis cases, housed in the Parasitic Diseases Branch (PDB). NNDSS data are periodically analyzed for use in informal reports to staff in the Division of Parasitic Diseases, and ad-hoc analyses occur for both internal use or upon request from other government agencies (e.g. in the past, USDA has wanted to know how many cases of trichinellosis reported during a certain time period were associated with consumption of domestic pork). A surveillance summary of the NNDSS data will be written by PDB staff every five years and published in *MMWR*. Data are published weekly in the *MMWR*, and yearly case counts are given in the *MMWR Summary of Notifiable Diseases*. There are no rules or restrictions on the printing of counts of case data. Only count data are released to other agencies or parties. It is the policy of CDC to refer outside agencies or parties to state health departments for more detailed information on cases.

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

CSTE requests that CDC adopt this standardized reporting definition for trichinellosis 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 trichinellosis to facilitate its prevention and control.

V. Methods for Surveillance

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

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

Source of data for case ascertainment	Coverage	
	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 “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).

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

A person with demonstration of *Trichinella* larvae in tissue obtained by muscle biopsy

A person with positive serologic test for *Trichinella* and any of the following: fever, myalgia, periorbital edema, or eosinophilia.

A person whose healthcare record contains a recent diagnosis of trichinellosis.

A person whose death certificate lists trichinellosis as a cause of death or a significant condition contributing to death.

Other recommended procedures

- all cases of trichinellosis should be reported
- reporting should be on-going and routine
- frequency of reporting should follow the state health department's routine schedule

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		
<i>Clinical Presentation</i>			
Fever	C	O	
Myalgia	C	O	
periorbital edema	C	O	
Eosinophilia	C	O	
healthcare record contains a recent diagnosis of Trichinellosis	S		
death certificate lists Trichinellosis as a cause of death or a significant condition contributing to death	S		
<i>Laboratory findings</i>			
demonstration of <i>Trichinella</i> larvae in tissue obtained by muscle biopsy	S		
positive serologic test for <i>Trichinella</i> (e.g., enzyme immunoassay [EIA], immunofluorescence)		N	N

Criterion	Reporting		
<i>Epidemiological risk factors</i>			
recent consumption of raw or undercooked meat, particularly pork products or wild game	C		
consumption of an epidemiologically implicated meat product	C		N

Notes:

N = This criterion in conjunction with all other “N” and any “O” criteria in the same column is required to report a case.

S = This criterion alone is sufficient to report a case.

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 report a case.

C = This finding corroborates (i.e., supports) the diagnosis of—or is associated with—trichinellosis, but is not required for reporting a case.

C. Disease Specific Data Elements:

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

Epidemiological risk factors

- History of recent consumption of raw or undercooked meat, particularly pork products or wild game
- History of consumption of an epidemiologically implicated meat product

VII. Case Definition for Case Classification

A. Narrative description of criteria to determine whether a case should be classified as confirmed.

Clinical description

A disease caused by ingestion of *Trichinella* larvae. The disease has variable clinical manifestations. Common signs and symptoms among symptomatic persons include eosinophilia, fever, myalgia, and periorbital edema.

Laboratory criteria for diagnosis

- Demonstration of *Trichinella* larvae in tissue obtained by muscle biopsy, or
- Positive serologic test for *Trichinella*

Case classification

Confirmed: a clinically compatible case that is laboratory confirmed

Comment

In an outbreak setting, at least one case must be laboratory confirmed. Associated cases should be reported as confirmed if the patient shared an epidemiologically implicated meal or ate an epidemiologically implicated meat product and has either a positive serologic test for trichinosis or a clinically compatible illness.

B. Classification Tables

Table VII-B lists the criteria that must be met for a case to be classified as confirmed.

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.

Criterion	Case Definition
	Confirmed
<i>Clinical Presentation</i>	
fever	O
myalgia	O
periorbital edema	O
eosinophilia	O
healthcare record contains a recent diagnosis of Trichinellosis	
death certificate lists Trichinellosis as a cause of death or a significant condition contributing to death	
<i>Laboratory findings</i>	
demonstration of <i>Trichinella</i> larvae in tissue obtained by muscle biopsy	O
positive serologic test for <i>Trichinella</i> (e.g., enzyme immunoassay [EIA], immunofluorescence)	O
<i>Epidemiological risk factors</i>	
recent consumption of raw or undercooked meat, particularly pork products or wild game	C
consumption of an epidemiologically implicated meat product	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—trichinellosis, 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 of all cases of trichinellosis prior to classification is recommended.

- NNDSS data will be added to the CDC's database of trichinellosis cases, housed in the Parasitic Diseases Branch (PDB). NNDSS data are periodically analyzed for use in informal reports to staff in the Division of Parasitic Diseases, and ad-hoc analyses occur for both internal use or upon request from other government agencies (e.g. in the past, USDA has wanted to know how many cases of trichinellosis reported during a certain time period were associated with consumption of domestic pork)
- A surveillance summary of the NNDSS data will be written by PDB staff every five years and published in *MMWR*. The next surveillance summary is due to be published in 2009.
- Data are published weekly in the *MMWR*, and yearly case counts are given in the *MMWR Summary of Notifiable Diseases*. There are no rules or restrictions on the printing of counts of case data.
- Only count data are released to other agencies or parties. It is the policy of CDC to refer outside agencies or parties to state health departments for more detailed information on cases.

X. References

Bruschi, F and KD Murrell. New aspects of human trichinellosis: the impact of new *Trichinella* species. *Postgrad. Med. J.* 2002; 78: 15-22.

Centers for Disease Control and Prevention (CDC). Case definitions for infectious conditions under public health surveillance. *MMWR* 1997;46(No. RR-10):1-57. Available from: <http://www.cdc.gov/mmwr/>

Centers for Disease Control and Prevention [Internet]. National notifiable diseases surveillance system: case definitions. Atlanta: CDC. Available from: <http://www.cdc.gov/ncphi/disss/nndss/casedef/index.htm> Last updated: 2008 Jan 9. Accessed: 2008 Oct 27.

Centers for Disease Control and Prevention [Internet]. Trichinellosis. Atlanta: CDC. Available from: <http://www.cdc.gov/ncidod/dpd/parasites/trichinosis/default.htm>. Last updated: 2008 Mar 31. Accessed: 2008 Oct 27.

Centers for Disease Control and Prevention [Internet]. Trichinellosis. Atlanta: CDC. Available from: <http://www.dpd.cdc.gov/dpdx/HTML/Trichinellosis.htm>. Last updated: 2008 Oct 17. Accessed: 2008 Oct 27.

Council of State and Territorial Epidemiologists (CSTE). Revised case definitions for public health surveillance: infectious disease. CSTE position statement 1996-18. Atlanta: CSTE; June 1996. Available from: <http://www.cste.org>.

Council of State and Territorial Epidemiologists (CSTE). CSTE official list of nationally notifiable conditions. CSTE position statement 07-EC-02. Atlanta: CSTE; June 2007. Available from: <http://www.cste.org>.

Council of State and Territorial Epidemiologists (CSTE). Criteria for inclusion of conditions on CSTE nationally notifiable condition list and for categorization as immediately or routinely notifiable. CSTE position statement 08-EC-02. Atlanta: CSTE; June 2008. Available from: <http://www.cste.org>.

Council of State and Territorial Epidemiologists (CSTE). Data Release Guidelines of the Council of State & Territorial Epidemiologists for the National Public Health System. Atlanta: CSTE; June 1996.

Council of State and Territorial Epidemiologists, Centers for Disease Control and Prevention. CDC-CSTE Intergovernmental Data Release Guidelines Working Group (DRGWG) Report: CDC-ATSDR Data Release Guidelines and Procedures for Re-release of State-Provided Data. Atlanta: CSTE; 2005. Available from: <http://www.cste.org/pdffiles/2005/drgwgreport.pdf> or <http://www.cdc.gov/od/foia/policies/drgwg.pdf>.

Grove DI. Chapter 286 – Tissue nematodes including trichinosis, dracunculiasis, and the filariases. In: Mandell GL, Bennett JE, Dolin R, editors. Principles and Practice of Infectious Diseases, 6th edition. Philadelphia: Churchill Livingstone; 2005.

Heymann DL, editor. Control of communicable diseases manual. 18th edition. Washington: American Public Health Association; 2004.

XI. Coordination:

Agencies for Response:

- (1) Thomas R Frieden, MD, MPH
Director
Centers for Disease Control and Prevention
1600 Clifton Road, NE
Atlanta GA 30333
(404) 639-7000
txf2@cdc.gov

XII. Submitting Author:

- (1) Bela Matyas, MD MPH
Chief, Disease Investigations Section
California Department of Public Health
850 Marina Bay Parkway
Bldg. P, 2nd floor
Richmond, CA 94804
(510) 620-3431
Bela.matyas@cdph.ca.gov

Co-Authors:

- (1) Associate Member
Harry F. Hull, Medical Epidemiologist
HF Hull & Associates, LLC
1140 St. Dennis Court
Saint Paul, MN 55116
(651) 695-8114
hullhf@msn.com
- (2) Associate Member
Cecil Lynch, Medical Informaticist
OntoReason
7292 Shady Woods Circle
Midvale, UT 84047
(916) 412.5504
clynch@ontoreason.com
- (3) Associate Member
R. Gibson Parrish, Medical Epidemiologist
P.O. Box 197
480 Bayley Hazen Road
Peacham, VT 05862
(802) 592-3357
gib.parrish@gmail.com