

10-ID-14

Committee: Infectious Disease

Title: Public Health Reporting and National Notification for non-streptococcal toxic shock syndrome

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:

Non-streptococcal toxic shock syndrome (TSS) is characterized by sudden onset of fever, capillary leak syndrome with hypotension and hypoalbuminemia, generalized edema, and rash. It can rapidly progress to severe multisystem dysfunction. TSS is often caused by exotoxin producing strains of *Staphylococcus aureus*. TSS has been associated with the use of high absorbency tampons (menstrual TSS), or caused by colonizing organisms from surgical wounds, lung, mucosa or skin, or contraceptive diaphragms.

In the United States, the annual incidence of TSS is 1-2/100,000 women 15-44 years of age (last active surveillance done in 1987). About five percent of all cases are fatal.

Justification:

Non-streptococcal toxic shock syndrome 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 non-streptococcal toxic shock syndrome to public health authorities
- CDC requests **standard** notification of non-streptococcal toxic shock syndrome to federal authorities
- CDC has condition-specific policies and practices concerning the agency’s response to, and use of, notifications.

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

CSTE requests that CDC adopt this standardized reporting definition for non-streptococcal toxic shock syndrome to facilitate 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 non-streptococcal toxic shock syndrome to facilitate its prevention and control.

V. Methods for Surveillance:

Surveillance for non-streptococcal toxic shock syndrome should use the following recommended sources of data and the extent of coverage listed in Table V.

Surveillance for non-streptococcal toxic shock syndrome should use the sources of data and the extent of coverage listed in Table V.

Table V. Recommended sources of data for case identification and extent of coverage for ascertaining cases of non-streptococcal toxic shock syndrome.

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 Case Identification

A. Narrative: A description of suggested criteria for case ascertainment:

- Report any illness to public health authorities that meets four of the five clinical criteria listed in Table VIB AND all of the laboratory criteria listed in Table VIB.
 - fever: temperature greater than or equal to 102.0°F (greater than or equal to 38.9°C)
 - rash: diffuse macular erythroderma
 - desquamation: 1-2 weeks after onset of rash
 - hypotension: systolic blood pressure less than or equal to 90 mm Hg for adults or less than fifth percentile by age for children aged less than 16 years
 - multisystem involvement (three or more of the following organ systems):
 - gastrointestinal: vomiting or diarrhea at onset of illness
 - muscular: severe myalgia or creatine phosphokinase level at least twice the upper limit of normal

- mucous membrane: vaginal, oropharyngeal, or conjunctival hyperemia
- renal: blood urea nitrogen or creatinine at least twice the upper limit of normal for laboratory or urinary sediment with pyuria (greater than or equal to 5 leukocytes per high-power field) in the absence of urinary tract infection
- hepatic: total bilirubin, alanine aminotransferase enzyme, or aspartate aminotransferase enzyme levels at least twice the upper limit of normal for laboratory
- hematologic: platelets less than 100,000/mm³
- central nervous system: disorientation or alterations in consciousness without focal neurologic signs when fever and hypotension are absent

And the laboratory evidence

Negative results on the following tests, if obtained:

- blood or cerebrospinal fluid cultures (blood culture may be positive for *Staphylococcus aureus*)
 - negative serologies for Rocky Mountain spotted fever, leptospirosis, or measles
- Report any person whose healthcare record contains a diagnosis of non-streptococcal toxic shock syndrome.
 - Report any person whose death certificate lists non-streptococcal toxic shock syndrome as a cause of death or a significant condition contributing to death.

Other recommended reporting procedures

- All cases of non-streptococcal toxic shock syndrome 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. Table of criteria to determine whether a case should be reported to public health authorities. Requirements for reporting are established under State and Territorial laws and/or regulations and may differ from jurisdiction to jurisdiction. These criteria are suggested as a standard approach to identifying cases of this condition for purposes of reporting, but reporting should follow State and Territorial law/regulation if any conflicts occur between these criteria and those laws/regulations.

Criterion	Reporting	
<i>Clinical evidence</i>		
fever (temperature $\geq 38.9^{\circ}\text{C}$ [102.0°F])		O*
diffuse macular erythrodermal rash		O*
desquamation 1-2 weeks after onset of illness, particularly on the palms and soles†		O*
hypotension (systolic blood pressure ≤ 90 mm Hg for adults <i>or</i> less than		O*

Criterion	Reporting	
fifth percentile by age for children aged less than 16 years)		
multisystem involvement, three of the following organ systems involved: gastrointestinal: vomiting <i>or</i> diarrhea at onset of illness - muscular: severe myalgia <i>or</i> creatine phosphokinase level at least twice the upper limit of normal - mucous membrane: vaginal, oropharyngeal, <i>or</i> conjunctival hyperemia - renal: blood urea nitrogen or creatinine at least twice the upper limit of normal for laboratory <i>or</i> urinary sediment with pyuria (≥ 5 leukocytes per high-power field) in the absence of urinary tract infection - hepatic: total bilirubin, alanine aminotransferase enzyme, <i>or</i> aspartate aminotransferase enzyme levels at least twice the upper limit of normal for laboratory - hematologic: platelets $< 100,000/\text{mm}^3$ - central nervous system: disorientation <i>or</i> alterations in consciousness without focal neurologic signs when fever and hypotension are absent		O*
healthcare record contains a diagnosis of non-streptococcal toxic shock syndrome	S	
death certificate lists non-streptococcal toxic shock syndrome as a cause of death or a significant condition contributing to death	S	
<i>Laboratory evidence</i>		
negative blood culture for organisms other than <i>Staphylococcus aureus</i> (if obtained)		N
negative cerebrospinal fluid culture (if obtained)		N
negative serologies for Rocky Mountain spotted fever (if obtained)		N
negative serologies for leptospirosis (if obtained)		N
negative serologies for measles (if obtained)		N

Notes:

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

N = All "N" criteria in the same column are required to report a case.

O* = Four of the five clinical criteria are required to meet the criteria for reporting the illness.

† This criterion is not necessary if the patient died before sufficient time elapsed for desquamation to occur.

C. Disease-specific data elements:

Disease-specific data elements to be included in the initial report are listed below. To be determined in conjunction with CDC.

VII. Case Definition for Case Classification

A. Narrative: Description of criteria to determine how a case should be classified.

Clinical case definition

An illness with the following clinical manifestations:

- fever: temperature greater than or equal to 102.0°F (greater than or equal to 38.9°C)
- rash: diffuse macular erythroderma
- desquamation: 1-2 weeks after onset of rash
- hypotension: systolic blood pressure less than or equal to 90 mm Hg for adults or less than fifth percentile by age for children aged less than 16 years
- multisystem involvement (three or more of the following organ systems):
 - gastrointestinal: vomiting or diarrhea at onset of illness
 - muscular: severe myalgia or creatine phosphokinase level at least twice the upper limit of normal
 - mucous membrane: vaginal, oropharyngeal, or conjunctival hyperemia
 - renal: blood urea nitrogen or creatinine at least twice the upper limit of normal for laboratory or urinary sediment with pyuria (greater than or equal to 5 leukocytes per high-power field) in the absence of urinary tract infection
 - hepatic: total bilirubin, alanine aminotransferase enzyme, or aspartate aminotransferase enzyme levels at least twice the upper limit of normal for laboratory
 - hematologic: platelets less than 100,000/mm³
 - central nervous system: disorientation or alterations in consciousness without focal neurologic signs when fever and hypotension are absent

Laboratory evidence

Negative results on the following tests, if obtained:

- blood or cerebrospinal fluid cultures (blood culture may be positive for *Staphylococcus aureus*)
- negative serologies for Rocky Mountain spotted fever, leptospirosis, or measles

Case classification

Probable: a case which meets the laboratory criteria and in which four of the five clinical findings described above are present

Confirmed: a case which meets the laboratory criteria and in which all five of the clinical findings described above are present, including desquamation, unless the patient dies before desquamation occurs

B. Classification Tables:

Table VII-B. Criteria for classifying a case of non-streptococcal toxic shock syndrome.

Criterion	Case Definition	
	Confirmed	Probable
<i>Clinical evidence</i>		
fever (temperature $\geq 38.9^{\circ}\text{C}$ [102.0°F])	N	O*
diffuse macular erythrodermal rash	N	O*
desquamation 1-2 weeks after onset of rash†	N	O*

Criterion	Case Definition	
	Confirmed	Probable
hypotension (systolic blood pressure \leq 90 mm Hg for adults <i>or</i> less than fifth percentile by age for children aged less than 16 years)	N	O*
multisystem involvement, signified by three or more of the following findings: <ul style="list-style-type: none"> - gastrointestinal: vomiting <i>or</i> diarrhea at onset of illness - muscular: severe myalgia <i>or</i> creatine phosphokinase level at least twice the upper limit of normal - mucous membrane: vaginal, oropharyngeal, <i>or</i> conjunctival hyperemia - renal: blood urea nitrogen or creatinine at least twice the upper limit of normal for laboratory <i>or</i> urinary sediment with pyuria (\geq 5 leukocytes per high-power field) in the absence of urinary tract infection - hepatic: total bilirubin, alanine aminotransferase enzyme, <i>or</i> aspartate aminotransferase enzyme levels at least twice the upper limit of normal for laboratory - hematologic: platelets $<$ 100,000/mm³ - central nervous system: disorientation <i>or</i> alterations in consciousness without focal neurologic signs when fever and hypotension are absent 	N	O*
<i>Laboratory evidence</i>		
negative blood culture for organisms other than <i>Staphylococcus aureus</i> (if obtained)	N	N
negative cerebrospinal fluid culture (if obtained)	N	N
negative serologies for Rocky Mountain spotted fever (if obtained)	N	N
negative serologies for leptospirosis (if obtained)	N	N
negative serologies for measles (if obtained)	N	N

Notes:

N = All “N” criteria in the same column are required to report or confirm a case.

O* = Four of the five clinical criteria are required to meet the criteria for reporting and for the illness to be classified as a *probable* case.

† This criterion is not necessary if the patient died before sufficient time elapsed for desquamation to occur.

VIII. Period of Surveillance:

Surveillance should be ongoing.

IX. Data sharing/release and Print criteria:

- Notification of confirmed and probable cases to CDC is recommended.

- TSS cases in NNDSS are summarized weekly in the MMWR Tables. Annual number of cases of TSS is also summarized in the yearly Summary of Notifiable Diseases. State-specific data may be reported in the annual summary.

X. References:

1. 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/>
2. Centers for Disease Control and Prevention [Internet]. National notifiable diseases surveillance system: case definitions. Atlanta: CDC. Available from: <http://www.cdc.gov/ncphi/diss/nndss/casedef/index.htm>. Accessed: 2010 Mar 22.
3. Centers for Disease Control and Prevention [Internet]. Toxic shock syndrome. Atlanta: CDC. Available from: http://www.cdc.gov/ncidod/dbmd/diseaseinfo/toxicshock_t.htm. Accessed: 2010 Mar 22.
4. 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>.
5. 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>.
6. Council of State and Territorial Epidemiologists (CSTE). Guidelines for Verification and Reporting of Designated Low Incidence and Internationally Quarantinable Diseases to the 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>.
7. Heymann DL, editor. Control of communicable diseases manual. 18th edition. Washington: American Public Health Association; 2004.
8. Hajjeh RA, Reingold A, Weil A, et al. Toxic shock syndrome in the United States: surveillance update, 1979-1996. *Emerg Infect Dis J*:1999;5(6). Available from: <http://www.cdc.gov/ncidod/eid/vol5no6/hajjeh.htm>.
9. Que Y, Moreillon P. Chapter 195 – *Staphylococcus aureus* (including staphylococcal toxic shock). In: Mandell GL, Bennett JE, Dolin R, editors. Principles and Practice of Infectious Diseases, 7th edition. Philadelphia: Churchill Livingstone; 2010.

XI. Coordination:

Agencies for Response:

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

XII. Submitting Author:

- (1) Bernadette Albanese, MD, MPH
Medical Director
Director, Disease Prevention and Control Division
El Paso County Department of Health and Environment
301 South Union Blvd
Colorado Springs, CO 80910
719-578-3258
bernadettealbanese@epchealth.org

Co-Authors:

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