

Committee: Infectious

Title: Public Health Reporting and National Notification for *Staphylococcus aureus* infection/colonization resistant to vancomycin (VRSA)

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

Staphylococcus aureus, is a bacterium commonly found on the skin and in the noses of healthy people. Occasionally, *S. aureus* can cause infection; *S. aureus* is one of the most common causes of skin infections in the United States. Most of these infections are minor (such as pimples, boils, and other skin conditions) and most can be treated without antimicrobial agents (also known as antibiotics or antibacterial agents). *S. aureus* can also cause serious and sometimes fatal infections (such as bloodstream infections, surgical wound infections, and pneumonia). In the past, most serious *S. aureus* bacterial infections were treated with antimicrobial agents related to penicillin. Over the past 50 years, treatment of these infections has become more difficult because staphylococci have become resistant to various antimicrobial agents, including the commonly used penicillin-related antibiotics.

VISA and VRSA are specific types of antimicrobial-resistant *S. aureus*. While most *S. aureus* bacteria are susceptible to the antimicrobial agent vancomycin some have developed resistance. VISA and VRSA cannot be successfully treated with vancomycin because these organisms are no longer susceptible to vancomycin. However, to date, all VISA and VRSA isolates have been susceptible to other Food and Drug Administration (FDA) approved drugs.

In 2002 the Council of State and Territorial Epidemiologists added VISA and VRSA to the national reportable disease list and placed them under surveillance through the National Notifiable Diseases Surveillance System (NNDDSS). The case definition used for surveillance is based on the laboratory breakpoints determined by the Clinical and Laboratory Standards

¹ Much of the material in the background is directly quoted from the CDC’s VISA/VRSA Website and CSTE position statement 06-ID-11. See the References for further information on these sources.

Institute (CLSI, formerly NCCLS). In January 2006, CLSI modified the breakpoints for *S. aureus* and vancomycin by lowering the intermediate breakpoint from 8-16 µg/ml to 4-8 µg/ml (VISA) and the resistant breakpoint from ≥ 32 µg/ml to ≥ 16 µg/ml (VRSA). In 2006 CSTE modified its case definitions for VISA and VRSA to meet the revised MIC interpretive standards.

Justification

Infection or colonization with *Staphylococcus aureus* resistant to vancomycin 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 *Staphylococcus aureus* resistant to vancomycin to public health authorities
- CDC requests **standard** notification of *Staphylococcus aureus* infection/colonization resistant to vancomycin 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 *Staphylococcus aureus* infection/colonization resistant to vancomycin 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 *Staphylococcus aureus* infection/colonization resistant to vancomycin to facilitate its prevention and control.

V. Methods for Surveillance

Surveillance for *Staphylococcus aureus* infection/colonization resistant to vancomycin 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 *Staphylococcus aureus* infection/colonization resistant to vancomycin.

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

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

Report any isolation of *S. aureus* from any body site that has a minimum inhibitory concentration ≥ 16 $\mu\text{g/ml}$, as detected and defined according to Clinical and Laboratory Standards Institute approved standards and recommendations (CLSI 2006).

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).

Report any person whose healthcare record contains a diagnosis of *Staphylococcus aureus* infection/colonization resistant to vancomycin.

Report any person whose death certificate lists *Staphylococcus aureus* infection resistant to vancomycin as a cause of death or a significant condition contributing to death.

Other recommended reporting procedures

- All cases of *Staphylococcus aureus* infection/colonization resistant to vancomycin 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>		
healthcare record contains a diagnosis of <i>Staphylococcus aureus</i> infection resistant to vancomycin		S
death certificate lists <i>Staphylococcus aureus</i> infection resistant to vancomycin as a cause of death or a significant condition contributing to death		S
<i>Laboratory findings</i>		
isolation of <i>S. aureus</i> from any body site	N	
resistance of the <i>S. aureus</i> isolate to vancomycin (Minimum Inhibitory Concentration [MIC] ≥ 16 $\mu\text{g/ml}$)†	N	

Notes:

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

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

† detected and defined according to Clinical and Laboratory Standards Institute approved standards and recommendations (CLSI 2006).

C. Disease Specific Data Elements:

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

VII. Case Definition for Case Classification

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

Clinical Description

S. aureus can produce a variety of syndromes with clinical manifestations including skin and soft tissue infections, empyema, bloodstream infection, pneumonia, osteomyelitis, septic arthritis, endocarditis, sepsis, and meningitis. *S. aureus* may also colonize individuals who remain asymptomatic. The most frequent site of *S. aureus* colonization is the nares.

Laboratory Criteria

- Isolation of *S. aureus* from any body site.
AND
- *S. aureus* isolate resistant to vancomycin, detected and defined according to Clinical and Laboratory Standards Institute (CLSI, formerly NCCLS) approved standards and recommendations (Minimum Inhibitory Concentration [MIC] $\text{MIC} \geq 16 \mu\text{g/ml}$).

Case Classification

Confirmed: A case of vancomycin-resistant *S. aureus* that is laboratory-confirmed ($\text{MIC} \geq 16 \mu\text{g/ml}$ for VRSA).

Reference

Clinical and Laboratory Standards Institute/NCCLS. Performance Standards for Antimicrobial Susceptibility Testing. Sixteenth informational supplement. M100-S16. Wayne, PA: CLSI, 2006.

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
	VRSA
<i>Clinical Presentation</i>	
healthcare record contains a diagnosis of <i>Staphylococcus aureus</i> infection resistant to vancomycin	
death certificate lists <i>Staphylococcus aureus</i> infection resistant to vancomycin as a cause of death or a significant condition contributing to death	
<i>Laboratory findings</i>	
isolation of <i>S. aureus</i> from any body site	N
resistance of the <i>S. aureus</i> isolate to vancomycin (Minimum Inhibitory Concentration [MIC] ≥ 16 $\mu\text{g/ml}$)†	N

Notes:

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

† detected and defined according to Clinical and Laboratory Standards Institute approved standards and recommendations (CLSI 2006).

VIII. Period of Surveillance

Surveillance should be on-going.

IX. Data sharing/release and print criteria

Notification to CDC for confirmed cases is recommended.

- Electronic reports of VRSA cases in NNDSS are summarized weekly in the MMWR Tables. Annual number of cases of VRSA is also summarized in the yearly Summary of Notifiable Diseases.
- VRSA cases in NNDSS are summarized weekly in the MMWR Tables. Annual number of cases of VRSA is also summarized in the yearly Summary of Notifiable Diseases. State-specific data may be reported in the annual summary.
- Cases of VRSA will be published in the weekly and annual MMWR only after review and confirmation by the responsible CDC program.
- No planned re-release of case data to WHO.

X. References

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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>.

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