

## 06-ID-11

**Committee:** Infectious Disease

**Title:** Surveillance for *Staphylococcus aureus* Infection with Decreased Susceptibility to Vancomycin, including both Vancomycin-Intermediate and Vancomycin-Resistant *Staphylococcus aureus*.

### **Statement of the Problem:**

In July 1997, the first case of infection caused by vancomycin-intermediate *Staphylococcus aureus* (VISA: intermediate susceptibility to vancomycin, MIC: 4-8 µg/ml) was reported in a peritoneal dialysis patient from Michigan. In June 2002, the first case of infection caused by vancomycin-resistant *Staphylococcus aureus* (VRSA: MIC ≥16 µg/ml) was reported in a hemodialysis patient from Michigan. Subsequently, five additional VRSA infections have been reported worldwide with four of the six occurring in Michigan. Most of these cases had a history of recurrent methicillin-resistant *Staphylococcus aureus* and significant contact with healthcare. The majority of these VISA/VRSA cases required extensive medical therapy for recovery. 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 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). Therefore, the current case definitions for VISA and VRSA need to be modified according to MIC interpretive standards. Lowering the intermediate breakpoint should not substantially increase the number of VISAs or VRSAs reported in the United States. Based on the intermediate breakpoint of 8-16 µg/ml there have been only 16 VISAs reported in the United States as of January 2006. CDC initiated confirmatory susceptibility testing in 1998 for all potential VISAs (vancomycin MIC ≥4 µg/ml). To date, CDC has confirmed approximately 60 *S. aureus* isolates for which the vancomycin MIC =4-8µg/ml (CDC unpublished data).

### **Statement of the desired action(s) to be taken:**

1) Modify the Vancomycin-intermediate and vancomycin-resistant *Staphylococcus aureus* case definitions to reflect the changes to the laboratory breakpoints by CLSI.

### **Public Health Impact:**

The public health impact would be minimal. The additional reported cases will allow better tracking of the emergence of the organism.

### **Goals of Surveillance:**

- 1) Monitor and describe the incidence, prevalence, distribution, and etiology of vancomycin-intermediate and vancomycin-resistant *Staphylococcus aureus*.
- 2) Rapidly recognize and characterize the emergence of new patterns of disease.
- 3) Provide information to control and prevent the further spread and deleterious public health consequences of vancomycin-intermediate and vancomycin-resistant *Staphylococcus aureus*.

### **Methods of Surveillance:**

Physician, health care provider, and laboratory reporting. Core surveillance data will be reported to CDC's National Notifiable Disease Surveillance System (NNDSS, a component of the NPHSS), through National Electronic Telecommunications System for Surveillance (NETSS) or the National Electronic Diseases Surveillance System (NEDSS), as per state protocol. Additional clinical, laboratory, and case investigation data will be collected and linked to the core NNDSS data in a manner consistent with the NEDSS and PHIN architecture. Submission of laboratory isolates for full characterization is a central element of laboratory surveillance.

**Case Definition:**

*Staphylococcus aureus* infection with decreased susceptibility to vancomycin, including both vancomycin-intermediate and vancomycin-resistant *Staphylococcus aureus* (VISA / VRSA).

**Clinical Description:**

*Staphylococcus aureus* can produce a variety of syndromes with clinical manifestations including skin and soft tissue lesions, empyema, pyarthrosis, 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:**

1) Isolation of *Staphylococcus aureus* from any body site.

AND

2) Intermediate or resistance of the *Staphylococcus aureus* isolate to vancomycin, detected and defined according to Clinical and Laboratory Standards Institute (CLSI, formerly NCCLS) approved standards and recommendations (MIC=4-8 µg/ml for VISA and MIC≥16 µg/ml for VRSA).

**Case Classification:**

Confirmed: A case of vancomycin-intermediate or vancomycin-resistant *Staphylococcus aureus* that is laboratory-confirmed (MIC=4-8 µg/ml for VISA and MIC≥16 µg/ml for VRSA).

**Period of Surveillance:**

Permanent, with review of reporting needs every five years.

**Background and Justification:**

Since the emergence of nosocomial methicillin-resistant *Staphylococcus aureus* (MRSA) infections in the 1980s, and more recently the emergence of community-associated MRSA infections, vancomycin has become the most reliable and effective drug of choice for treating these infections. Because there is limited availability of therapies to treat MRSA beyond vancomycin, the recent confirmed cases of vancomycin-intermediate and vancomycin-resistant *Staphylococcus aureus* (VISA/VRSA) are of great concern, because they can become an established emerging infectious disease. Widespread use of antimicrobials, such as vancomycin, is a major contributing factor for the emergence of antimicrobial resistant organisms, including vancomycin-resistant *Enterococcus* and other vancomycin-resistant organisms. VISA/VRSA has the potential to emerge and spread without judicious use of antimicrobials, appropriate identification of the organisms, and implementation of infection control precautions. In the first 16 U.S. cases of VISA and 6 cases of VRSA, spread of the resistant organism to other patients and healthcare workers was prevented by prompt identification of the isolate and implementation of recommended infection control practices. Without broad, standardized surveillance, the true prevalence and incidence of VISA/VRSA infections in the U.S. are unknown. The development of ongoing nationwide surveillance for these resistant organisms will help to heighten awareness of these infections, identify factors that place individuals at higher risk for acquisition, assess the risk of person-to-person transmission, and implement appropriate control measures. The development of ongoing nationwide surveillance to monitor these resistant strains will help to heighten awareness and stress the importance of the detection, control, and prevention of these currently emerging organisms.

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**References:**

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