VISA (Vancomycin Intermediate *Staphylococcus aureus*)
VRSA (Vancomycin Resistant *Staphylococcus aureus*)

rev Oct 2016

BASIC EPIDEMIOLOGY

Infectious Agent
Vancomycin Intermediate *Staphylococcus aureus* (VISA) and Vancomycin Resistant *Staphylococcus aureus* (VRSA) are specific types of the bacteria called *Staphylococcus aureus* that have become resistant to the antibiotic Vancomycin. *Staphylococcus aureus*, also called staph, is a bacterium commonly found on the skin and in the nose of about 30% of individuals and most of the time does not cause any harm. Occasionally, staph can cause infection and is one of the most common causes of skin infections in the United States. These skin infections can look like pimples, boils, or other skin conditions and most are able to be treated. In rare circumstances, staph bacteria can cause serious infections and even be fatal.

Transmission
Transmission of this organism can occur via direct person-to-person contact or secondary contact with contaminated environmental surfaces, medical devices, or equipment. Additionally, the hands of healthcare workers who frequently touch these objects in patient care environments often become vectors of transmission. Implementation of hand hygiene compliance and/or transmission-based precautions can reduce the risk of transmission.

Incubation Period
There is no set incubation period for exposure-to-illness onset.

Communicability
The period of communicability is unknown and may be as long as the organism is present in the individual.

Clinical Illness
VISA/ VRSA can cause infections in almost any part of the body including bloodstream infections, ventilator- associated pneumonia, intra-abdominal abscesses, osteomyelitis (bone infection), and endocarditis (infection of the heart valves). Symptoms associated with VISA and VRSA infections generally vary based on the site that is infected (e.g., cough if in the lungs, urinary symptoms if in the bladder) but can also include general symptoms like fever or chills.

Severity
Texas has never confirmed a case of VRSA. As of May 2015, there have been 14 VRSA cases reported in the USA since 2002. Thus, identification of a VRSA is extremely rare and should be treated as a highly unusual event.

DEFINITIONS

Clinical Case Definition
When identified in a clinical culture, VISA and/or VRSA can represent an infection or a colonization. There is no set clinical case definition for S. aureus as it can cause many different types of symptoms.

Laboratory Confirmation
Vancomycin Intermediate *Staphylococcus aureus* (VISA):

- A vancomycin- intermediate *Staphylococcus aureus* from any body site/source that is laboratory confirmed. (MIC: 4-8 µg/ml)

Vancomycin Resistant *Staphylococcus aureus* (VRSA):

- A vancomycin-resistant *Staphylococcus aureus* from any body site/source that is laboratory confirmed. (MIC: ≥ 16 µg/ml)

Case Classification

VISA

- **Confirmed:** Isolation of *Staphylococcus aureus* from any body site,

AND

Intermediate-level resistance (MIC: 4-8 µg/ml) of the *Staphylococcus aureus* isolate to vancomycin, detected and defined according to CLSI approved standards and recommendations.

VRSA

- **Confirmed:** Isolation of *Staphylococcus aureus* from any body site,

AND

High-level resistance of the *Staphylococcus aureus* isolate to vancomycin (MIC: ≥16µg/ml), detected and defined according to CLSI approved standards and recommendations.

SURVEILLANCE AND CASE INVESTIGATION

Case Investigation
Local and regional health departments should address all reports of VISA/VRSA immediately. The jurisdiction where the healthcare facility is located conducts the investigation and ensures control measures are promptly taken. The investigation steps below describe the public health activities to be completed when a suspected or confirmed VISA/ VRSA case is reported. Investigations and control measures are required for infection or colonization by VISA/VRSA.

Case Investigation Checklist

- The jurisdiction that should conduct the investigation should be according to the location where the patient tested positive for VISA/ VRSA. (Ex: patient tested positive for VISA and is in hospital in jurisdiction A but the patient resides in jurisdiction B, jurisdiction A would conduct the investigation).
- Immediately ensure contact precautions have been implemented for anyone with suspected or confirmed VISA/ VRSA.
- Confirm that the laboratory results meet the case definition.

    - If it is unclear, call a DSHS HAI Epidemiologists for assistance.
- Ensure additional control measures are in place for cases and/or facilities. (see "specific control measures" section below)
- Immediately notify the DSHS regional HAI Epidemiologist or the DSHS HAI Epidemiologist for Texas (central office) by phone.
- Immediately verify that the healthcare facility laboratory has sent the VISA/ VRSA isolate to the DSHS laboratory for confirmation testing. (see laboratory procedures below)
- Review the medical records. If needed, speak to an Infection Preventionist (IP) at the healthcare facility to verify demographics, symptoms, and course of illness.
- If the patient has been discharged from the reporting healthcare facility and the receiving healthcare facility is known, the investigator ensures that the receiving healthcare facility is informed of the VISA/ VRSA case and ensures control measures are in place.
- Refer to the VISA/VRSA Investigation form for additional questions to address.
    - The VISA/ VRSA Investigation Form is available on the DSHS Website: http://www.dshs.state.tx.us/idcu/investigation/
- All suspected and confirmed cases of VISA/ VRSA require the investigation form to be completed and a copy of the laboratory report be sent to DSHS EAIDB.
- Enter all case investigations and submit a notification in NBS within 30 days of the initial report.
    - The jurisdiction that conducted the investigation enters the case in NBS.
    - The jurisdiction is entered as the jurisdiction who conducted the investigation and not the jurisdiction of residency.
    - Once the case is reviewed and approved by DSHS central office, the central office will update the jurisdiction to the jurisdiction of residency for aggregate reporting purposes.
    - NOTE: if a case is multi-jurisdictional, it is the responsibility of the investigator to notify other jurisdictions of the case.

Prevention and Control Measures

Control measures for Cases

Ideally, the facility is performing control measures for the case and the investigator is communicating directly with the facility, most likely with the IP or the responsible representative over infection prevention. The investigator may also speak with the patient directly if applicable. The investigator ensures the below control measures are addressed but not all specific control measures might be necessary for all case investigations.

Specific Control Measures

- Facilities are responsible for ensuring that healthcare personnel are vigilant with hand hygiene practices and ensure that:
    - Hand hygiene sinks are accessible and free from clutter/supplies;
    - Alcohol-based hand sanitizers are accessible and well stocked.
- Ensure the patient is on contact precautions/ contact isolation. Contact precautions include but are not limited to:
    - Performing hand hygiene before entry into the patient room;
    - Donning (putting on) gown and gloves either before or upon immediate entry into the patient's room; (note some facilities might require more PPE)
    - Doffing (removing) gown, gloves and any other personal protective equipment (PPE) should be removed before exiting or immediately upon exiting the patient's room. Hand hygiene should be performed after removal of PPE.

    - Hand hygiene should be performed before exiting or immediately upon exiting the patient's room.
    - No recommendation currently exists for when to discontinue contact precautions. A facility should consult with an infectious disease physician, the IP, or the other provider that initiated the precautions. The facility may also call a DSHS HAI Epidemiologists for assistance.
- Ensure the facility is performing disinfection of reusable equipment before and after each use.
- Specifically for VRSA cases: during the investigation there might be a need to identify other contacts to the VRSA patient. Contacts should be categorized based on their level of interaction (i.e., extensive, moderate, or minimal) with the VRSA colonized or infected patient.
    - Priority should be given to identifying contacts who have had **extensive interaction** with the VRSA patient during a defined period before the VRSA culture date.
        - Recommend culturing multiple (e.g., 2 to 3) frequently colonized sites, such as anterior nares, throat, groin, axilla, or peri-rectal area, plus any skin lesions (e.g., abscess or dermatitis, open wounds).
        - Work with your DSHS regional HAI Epidemiologist to further identify a plan.
- Recommend single patient rooms if available.
    - If single rooms are not feasible, recommend cohorting like patients (ex: a patient with VISA and another patient with VISA)
- Recommend staff cohorting if possible.
- Recommend reducing the use of invasive medical devices for patients on the unit where the case was cared for, as invasive devices increase patient's risk of infection.
- Increase the frequency of cleaning of high touch areas.
- Provide education on VISA/ VRSA as needed, with specific emphasis on contact precaution and the above control measures.
    - If additional help is needed regarding providing education, contact your DSHS Regional HAI Epidemiologist. (Education could be provided to: anyone at the facility, family members, and the patient.)

Treatment

Each case will have a unique treatment option. It is recommended that the reporting facility collaborate with a clinical pharmacist, an infectious disease physician, and/ or the antibiotic stewardship resource for an individualized treatment plan.

Exclusions

Students (K-12) and daycare age children with VISA/ VRSA wound infection need to be excluded from attendance until drainage from wounds or skin and soft tissue infections is contained and maintained in a clean dry bandage; restrict from situations that could result in the infected area becoming exposed, wet, soiled, or otherwise compromised. No other exclusions apply.

MANAGING SPECIAL SITUATIONS

Outbreaks
If an outbreak is suspected, immediately notify a DSHS regional HAI Epidemiologist. The DSHS regional HAI Epidemiologist will notify central office and work with central office as needed.

Outbreak Definition
VISA - at this time there is no defined criteria for an outbreak of VISA. If your health department believes they have detected an outbreak, it is recommended to speak with the DSHS regional HAI Epidemiologist.

VRSA – one case of VRSA would be considered an outbreak and should be reported immediately by phone to the DSHS regional HAI Epidemiologist.

REPORTING AND DATA ENTRY REQUIREMENTS

Provider, School and Child-care Facilities, and General Public Reporting Requirements
Cases of Vancomycin Intermediate *Staphylococcus aureus* (VISA) and Vancomycin Resistant *Staphylococcus aureus* (VRSA) should be reported ***immediately*** to the local or regional health department. If jurisdiction is unclear, call the DSHS regional HAI Epidemiologist or Emerging and Acute Infectious Disease Branch (EAIDB) at 512-776-7676 for assistance.

Local and Regional Reporting and Follow-up Responsibilities
Local and regional health departments should:

- Immediately investigate any suspect or confirmed cases.
- Immediately notify a DSHS regional HAI Epidemiologist by phone. The DSHS regional HAI Epidemiologist should report the case to central office.
- Ensure control measures are in place and provide education to prevent further spread of disease (see specific control measures section located in this document).
- Enter the case into NBS when the first occurrence is reported and create the NBS notification to DSHS on all cases of VISA/ VRSA. Complete additional case information and enter the remaining information within 30 days of initial report.
    - Please refer to the NBS Data Entry Guide for specific details on how to properly complete an NBS investigation, how to data enter a laboratory report and submit a NBS notification.

When a cluster or an outbreak is investigated, local and regional health departments should:

- Report suspected outbreaks immediately to a DSHS regional HAI Epidemiologist.
    - Fax the investigation form and all other supporting documents to the DSHS regional HAI Epidemiologist.
- If labeling a case as part of an outbreak, the outbreak must be named in NBS. Outbreak names must be requested through the NEDSS (NBS) office. The staff can be reached by phone (512) 458-7111 ext. 7729 or email nedss@dshs.state.tx.us

DISEASE REPORTING

Purpose of Reporting and Surveillance

- To prevent transmission of infections with VISA/ VRSA in healthcare facilities and the community by decreasing the likelihood of transmission through the investigation process.
- To improve the detection, monitoring and epidemiological characterization of VISA/ VRSA in Texas.
- To develop, implement and evaluate strategies to prevent the emergence, transmission and persistence of VISA/ VRSA.
- To conduct and support epidemiological studies to identify outbreaks and potential sources of ongoing transmission in various populations.
- To identify further trends related to continued antibiotic resistance and the development of MDROs in Texas.

Requested Reporting

- Report VISA/ VRSA to the most local health jurisdiction **immediately.**

Local Health Jurisdiction Investigation Responsibilities

- Local health departments may request assistance with the investigation of VISA/ VRSA by contacting both the DSHS Lead Epidemiologist and the DSHS regional HAI Epidemiologist for the health service region (HSR).
- Because of the potential for transmission of VISA/ VRSA to vulnerable patients in healthcare settings, public health action is imperative in controlling further transmission by: instituting control measures, identifying and screening close contacts of cases that could transmit the organism in healthcare settings, if indicated, and ensuring the facility's IP has been notified and that appropriate infection control measures are in place.

LABORATORY PROCEDURES

As required by the Texas Administrative Code (TAC), all *Staphylococcus aureus* isolates with a vancomycin MIC greater than 2 μg/ml must be submitted to the DSHS laboratory.

The DSHS laboratory uses the Etest for confirmation of resistance. Etest generates MIC values from a continuous scale and can give results in-between conventional twofold dilutions. According to manufacturer's protocol, a value which falls between standard two-fold dilutions is rounded up to the next upper two-fold value before categorization so that a MIC of 3μg/ml is reported as intermediate resistance. These protocols are also in accordance with CLIA defined protocols.

If you are suspecting a possible outbreak situation and need molecular testing, prior approval from a DSHS HAI epidemiologist is required.