

VISA/VRSA**BASIC EPIDEMIOLOGY****Infectious Agent**

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

(VRSA) are *Staphylococcus aureus* that have reduced susceptibility to the antibiotic vancomycin. These

S. aureus bacteria are classified as VISA or VRSA based on laboratory tests of the minimum inhibitory concentration (MIC) of the antibiotic resistance. VISA and VRSA differ in the amount of resistance they possess to vancomycin.

S. aureus, also called staph, can infect or colonize any site of the body but it 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, the *S. aureus* bacteria can cause serious infections and even be fatal. Serious *S. aureus* infections are usually treated with vancomycin, thus infections with VISA and VRSA are usually more difficult to treat. However, as of October 2020, all VISA and VRSA isolates have been susceptible to other Food and Drug Administration (FDA)-approved drugs.

Although anyone can be susceptible to VISA and VRSA, individuals that are infected or colonized with VISA/VRSA are more likely to have several underlying health conditions (such as diabetes and kidney disease), previous infections with Methicillin-Resistant *Staphylococcus aureus* (MRSA), medical devices (such as intravenous [IV] catheters, ventilators, etc.), recent hospitalizations, or recent exposure to vancomycin or other antimicrobial agents.

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. Adherence to standard precautions, including hand hygiene, and 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 any body site. Types of infections include: 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

A confirmed VRSA case has not yet been identified in Texas. As of 2019, 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

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.
AND
 - Confirmed by the DSHS Laboratory

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 (clinical and Laboratory Standards Institute) approved standards and recommendations.
AND
 - Confirmed by the DSHS Laboratory

Case Classification

Vancomycin Intermediate *Staphylococcus aureus* (VISA):

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

Note: 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 two-fold 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.

Vancomycin Resistant *Staphylococcus aureus* (VRSA):

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

SURVEILLANCE AND CASE INVESTIGATION

Case Investigation

Local and regional health departments will 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 conducts the investigation is according to the location where the patient tested positive for VISA/VRSA. (Ex: patient tested positive for VISA and is in a hospital in jurisdiction A but the patient resides in jurisdiction B, jurisdiction A would conduct the investigation).
- Review susceptibility report to confirm that the laboratory results meet the initial case definition
 - If it is unclear, call a DSHS HAI Epidemiologist for assistance
- Immediately ensure contact precautions and additional control measures have been implemented if the patient is still receiving care in any healthcare setting (see “control measures” section below).
- Immediately notify a DSHS HAI Epidemiologist 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.
- Verify that the treating physician has been made aware of these susceptibility results.
- 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 contact precautions and additional 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.texas.gov/idcu/investigation/>
- All confirmed cases of VISA/VRSA require the investigation form to be completed.
- 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.
 - The jurisdiction that is entering the case should add a note to DSHS central office as described in the NBS Data Entry Guide to request jurisdiction change upon case approval.
 - Once the case is reviewed and approved, the approver 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

To prevent the spread of VISA/VRSA in a healthcare facility, it is imperative that control measures are implemented. The investigator should communicate with the IP or the person responsible for the infection control program to ensure control measures are in place.

Control Measures

Note: Not all control measures may be necessary for all cases. If you need assistance in determining which control measures are needed, call a DSHS HAI Epidemiologist.

- Facilities are responsible for ensuring that healthcare personnel perform hand hygiene - use alcohol-based hand rub or wash hand with soap and water before and after contact with patient or their environment.

- Ensure the patient is on contact precautions. Contact precautions include but are not limited to:
 - Donning (putting on) gown and gloves either before or upon immediate entry into the patient's room; (note some facilities might require more personal protective equipment [PPE]).
 - Doffing (removing) gown, gloves and any other PPE 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 Epidemiologist for assistance.
- Ensure the facility is using disposable noncritical patient-care equipment (e.g., blood pressure cuffs) or implement patient-dedicated use of such equipment. If common use of equipment for multiple patients is unavoidable, clean and disinfect such equipment with an EPA approved disinfection before use on another patient.
- Recommend single patient rooms if available.
 - If single rooms are not feasible, recommend cohorting like patients (e.g., 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 a DSHS HAI Epidemiologist. (Education could be provided to: the patient, family members, visitors and/or facility's staff).
- Specifically for VRSA cases: during the investigation there might be a need to identify other contacts to the VRSA patient. See the CDC's "[Investigation and Control of Vancomycin- Resistant Staphylococcus aureus \(VRSA\): 2015 Update](#)". Work with a DSHS HAI Epidemiologist to further identify a plan.

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 an 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 HAI Epidemiologist. The DSHS 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 HAI Epidemiologist.

VRSA - one case of VRSA would be considered an outbreak and should be reported immediately by phone to the DSHS 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 HAI Epidemiologist or Emerging and Acute Infectious Disease Branch (EAIDU) 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 HAI Epidemiologist by phone. All cases of VISA/VRSA should be reported by the DSHS HAI Epidemiologist to central office.
- Ensure control measures are in place and provide education to prevent further transmission
(see “Control Measures” section located above in this document).
- Complete the VRSA/VISA Case Report Form, enter the case into NBS and create the NBS notification to DSHS on all confirmed cases of VISA/VRSA (DSHS Laboratory must provide confirmatory testing) 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.
 - Local health departments may request assistance with the investigation of VISA/VRSA by contacting the DSHS HAI Epidemiologist for the public health region (PHR).

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

- 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.texas.gov.

DISEASE REPORTING

Purpose of Reporting and Surveillance

- To improve the detection, monitoring and epidemiological characterization of VISA/VRSA in Texas.
- To prevent the transmission of VISA/VRSA in healthcare facilities by ensuring implementation of contact precautions and control measures.
- To conduct investigations and support epidemiological studies to identify outbreaks and potential sources of ongoing transmission of VISA/VRSA in the community.

Requested Reporting

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

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 laboratory can be reached at 512-776-7318)

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.

REVISION HISTORY

January 2018

- Minor grammatical corrections
- Corrections to improve flow of information
- Added information to these sections
 - Infectious Agent
 - Prevention and Control
- Under Definition
 - Switched Case Classification and Laboratory Confirmation headings
 - Added requirement that must be "Confirmed by the DSHS laboratory"
- Changed Surveillance and Case Investigation Section – to state that **only** confirmed cases of VISA/VRSA will require completion of the investigation form.
- No requirement to fax forms to Central Office