

IN THIS ISSUE: VANCOMYCIN-INTERMEDIATE (VISA) AND VANCOMYCIN-RESISTANT S. AUREUS (VRSA)

Vancomycin-intermediate (VISA) and Vancomycin-resistant S. aureus (VRSA)

Introduction

Staphylococcus aureus (staph) is a bacterium commonly found on the skin and in the nose of 30-50% of people. While often staph does not cause any harm, it can cause a variety of infections, including localized, invasive, and toxin-mediated. Some infections can be very serious or even fatal.^{1,2}

Vancomycin-intermediate *S. aureus* (VISA) and Vancomycin-resistant *S. aureus* (VRSA) are specific types of antimicrobial-resistant bacteria. Staph bacteria are classified as VISA if the minimum inhibitory concentration (MIC) for vancomycin is 4-8µg/ml, and classified as VRSA if the vancomycin MIC is ≥16µg/ml. VISA/VRSA are significant because vancomycin is an important drug for treating infections caused by *S. aureus* strains that are resistant to other antibiotics. The reduced susceptibility of VISA and VRSA strains to vancomycin leaves clinicians with relatively few therapeutic options for treating these infections.³

Epidemiology

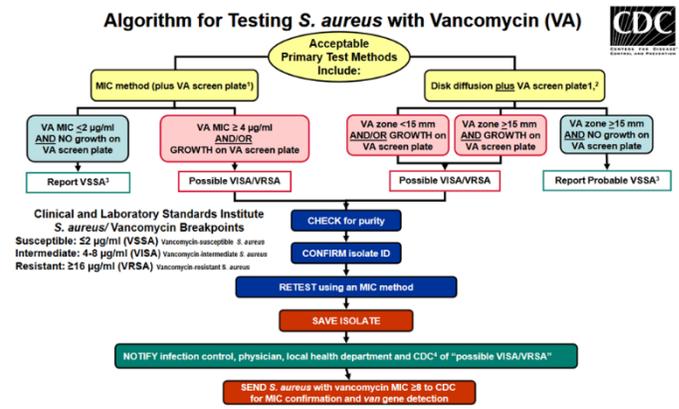
VRSA infections are very rare. As of January 2022, 16 VRSA infections have been reported in U.S. patients. None have been reported in Nevada. VRSA strains are characterized by expression of *vanA* acquired from an *Enterococcus spp*; therefore, this resistance is potentially transferable to susceptible strains or other organisms. In contrast, as of 2015 all VISA examined have had non-transferable resistance mechanisms.^{3,4,6} Risk factors for VISA/VRSA include prior methicillin-resistant *S. aureus* (MRSA) and enterococcal infections or colonization, underlying conditions such as chronic skin ulcers or diabetes, and previous treatment with vancomycin.^{2,4,6}

Diagnosis & Testing

The Centers for Disease Control and Prevention (CDC) VISA/VRSA testing algorithm is in Figure 1. **All *S. aureus* strains for which the vancomycin**

MIC is ≥4 µg/ml are unusual and should not be discarded until the MICs have been confirmed by a validated method. In addition, labs should ensure that the strain is in pure culture and confirm the organism identification.⁴ **If retesting confirms identity, purity, and a vancomycin MIC ≥4 µg/ml, labs should immediately notify infection control and Northern Nevada Public Health (NNPH).** NNPH will assist in arranging for the isolate to be sent to the Nevada State Public Health Laboratory (NSPHL). NSPHL will verify the isolate identity and purity and verify the vancomycin resistance. If results indicate VISA/VRSA, NSPHL will send the isolate to CDC for confirmation. Furthermore, because of exchange of genetic material from vancomycin-resistant *enterococci* (VRE) to MRSA in the emergence of VRSA, CDC is asking clinical labs to save all VRE, MRSA, and VRSA isolates from patients with suspected or confirmed VRSA. VRE or MRSA isolates from VRSA patients should also be submitted to NSPHL.^{4,6}

Figure 1: S. aureus Vancomycin Testing Algorithm



¹Laboratories using automated MIC methods that have not been validated for VRSA detection and laboratories using disk diffusion should add a commercial BHA VA agar screen plate (6 µg/ml).
²Disk diffusion will not differentiate VISA (MICs 4-8) from susceptible strains (MICs 0.5-2). The vancomycin disk test will detect VRSA isolates containing the *vanA* resistance gene by showing no zone of inhibition around the disk (zone = 6 mm). VA screen plate will not reliably detect strains for which MIC=4 µg/ml.
³If concerned about a result based on a patient's history, send to a reference lab for MIC testing.
⁴Report only isolates with MIC ≥8 µg/ml or zone diameter = 6 mm to CDC by email: SEARCH@cdc.gov
More VISA/VRSA info: http://www.cdc.gov/hai/organisms/visa_vrsa/visa_vrsa.html

Source: https://www.cdc.gov/hai/settings/lab/visa_vrsa_algorithm.html.

Treatment

Treatment is dependent on in vitro susceptibility test results. Treatment decisions will likely be made in consultation with an infectious disease specialist.²

Prevention

Staph bacteria are spread among people having close physical contact with infected patients or contaminated material, such as bandages. Persons having close physical contact with infected patients while they are outside of the healthcare setting should practice hand hygiene, avoid contact with other people's wounds or material contaminated from wounds, avoid sharing of personal items (e.g., towels, razors, clothing), and do regular cleaning of frequently touched environmental surfaces. If someone goes to a healthcare facility to visit a patient with VISA or VRSA, they should also follow the facility's recommended precautions.^{1,2} Standard and contact precautions are recommended in patient care settings.⁵

Medical Facility Responsibilities

Nevada Administrative Code (NAC) 441A.693 outlines responsibilities of both the health authority and medical facilities in the event of a case of VISA/VRSA. Per NAC 441A.693, if the VISA/VRSA case is in a medical facility, the medical facility must:

- Provide care to the case in accordance with appropriate disease specific precautions, including, without limitation: (a) isolating the case in a private room; (b) minimizing the number of persons providing care to the case; and (c) requiring any person who provides care to the case to use contact precautions.
- Dedicate for use only on the case any nondisposable item that cannot be cleaned and disinfected between uses.
- Inform and educate the appropriate persons about the presence in the medical facility of a case with VISA/VRSA and the need to observe infection control precautions.
- Perform baseline cultures of specimens from the hands and nares of: (a) any person who has had physical contact with the case; (b) healthcare providers of the case; and (c) roommate(s) of the case.
- Assess the efficacy of any contact or disease-specific precautions or other infection control precautions that are in effect by testing the appropriate personnel for VISA/VRSA.

- Consult with the health authority before transferring or discharging the case from the medical facility.

If the patient needs to be admitted or transferred to another facility, the transferring facility should ensure that the patient's VISA/VRSA status and required infection control precautions are communicated at transfer. Furthermore, facilities should flag the patient's chart to indicate infection/colonization with VISA/VRSA.⁴

Reporting

VISA and VRSA are both reportable communicable diseases. The full list of reportable communicable diseases and reporting forms can be found at: <http://tinyurl.com/WashoeDiseaseReporting>.

Report communicable diseases to Northern Nevada Public Health. To report a communicable disease, please call 775-328-2447 or fax your report to NNPH at 775-328-3764.

Acknowledgement

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References

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