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

Disease Plan

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Questions about this disease plan? Contact the Utah Department of Health, Bureau of Epidemiology: 801-538-6191.
WHY IS VRSA/VISA IMPORTANT TO PUBLIC HEALTH?

Vancomycin continues to be an important antimicrobial agent for treating infections caused by *Staphylococcus aureus* (*S. aureus*) strains that are resistant to methicillin and other antimicrobial agents. The reduced susceptibility of vancomycin intermediate *Staphylococcus aureus* (VISA) and vancomycin-resistant *Staphylococcus aureus* (VRSA) bacteria to antimicrobial therapy leaves clinicians with relatively few options for treating these infections. Proper treatment, as well as documentation of VISA or VRSA cases, is necessary to prevent further emergence of antibiotic resistant strains.

DISEASE AND EPIDEMIOLOGY

Clinical Description

*S. aureus* can cause a variety of skin and soft tissue infections, as well as invasive disease including bacteremia, endocarditis, toxic shock syndrome, etc. *Staphylococci* produce a variety of extracellular pathogenic factors that are responsible for many disease manifestations, including toxins (poisons), leukocidins (ability to destroy white blood cells), and hemolysins (the ability to destroy red blood cells), as well as the ability to produce biofilms and capsules (which help bacteria evade the immune system).

Causative Agent

*S. aureus* is a gram positive cocci (bacteria). VRSA and VISA are bacteria that have acquired resistance (complete or intermediate resistance) to a glycopeptide antibiotic known as vancomycin.

All VRSA isolates to date have been oxacillin-resistant and contained the resistance gene mecA. Most VISA isolates were also oxacillin-resistant. However, two VISA isolates became oxacillin-susceptible upon repeat isolation from the patient, and one was oxacillin-susceptible, but contained the mecA gene.

Differential Diagnosis

Vancomycin and teicoplanin are glycopeptides antibiotics. If *S. aureus* is resistant to both of these antibiotics, it would be known as glycopeptides resistant/intermediate *S. aureus* or GRSA/GISA.

Laboratory Identification

The following algorithm demonstrates the appropriate laboratory identification schema. Additional information can be found at:

It is important to recognize that automated testing methods commonly located in laboratories may not reliably detect this organism. However, all automated susceptibility testing (AST) systems currently approved for use in the United States (U.S.) can reliably detect VRSA.

The breakpoints for classifying *S. aureus* isolates with reduced susceptibility to vancomycin are defined by the Clinical and Laboratory Standards Institute (CLSI) as the following minimum inhibitory concentration (MIC) levels:

<table>
<thead>
<tr>
<th>Antimicrobial Agent</th>
<th>MIC Interpretive Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>&lt;2</td>
</tr>
</tbody>
</table>

*MIC tests should be performed to determine the susceptibility of all isolates of staphylococci to vancomycin. The disk test does not differentiate vancomycin-susceptible isolates of *S. aureus* from vancomycin-intermediate isolates. These standards were last updated in 2009.*

![Algorithm for Testing *S. aureus* with Vancomycin (VA)](attachment:algorithm.png)

**Algorithm for Testing *S. aureus* with Vancomycin (VA)**

- **MIC method (plus VA screen plate)**
  - VA MIC <2 μg/ml AND NO growth on VA screen plate
  - Report VSSA
  - Possible VISA/VRSA

- **Disk diffusion plus VA screen plate**
  - VA MIC ≥ 4 μg/ml AND/OR GROWTH on VA screen plate
  - Possible VISA/VRSA
  - VA zone <15 mm AND/OR GROWTH on VA screen plate
  - VA zone ≥15 mm AND NO growth on VA screen plate
  - Report Probable VSSA

**Clinical and Laboratory Standards Institute *S. aureus*/Vancomycin Breakpoints**

- Susceptible: <2 μg/ml (VSSA)
- Intermediate: 4-8 μg/ml (VISA)
- Resistant: ≥16 μg/ml (VRSA)

**Important Footnotes**

1. Laboratories using automated MIC methods that have not been validated for VRSA detection and laboratories using disk diffusion should add a commercial BHI VA agar screen plate (6 μg/ml).
2. Disk 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.
3. If concerned about a result based on a patient’s history, send to a reference lab for MIC testing.
4. Report only isolates with MIC ≥ 8 μg/ml or zone diameter ≥ 6 mm to CDC by email: SEARCH@cdc.gov

In addition to automated systems, VRSA isolates are detected by reference broth microdilution, agar dilution, gradient diffusion, and vancomycin screen agar plates [brain heart infusion (BHI) agar containing 6 µg/ml of vancomycin]. Disk diffusion is not recommended for testing vancomycin susceptibility in *S. aureus* for reasons described below.

VISA can be detected by automated MIC methods, although many commercial AST systems and gradient diffusion tend to produce vancomycin MICs that are 0.5-1 doubling dilutions higher than reference methods (e.g., broth microdilution or agar dilution). VISA isolates are not detected by disk diffusion because zone diameters produced by vancomycin susceptible and VISA strains are indistinguishable. Vancomycin screen agar plates usually detect VISA for which the vancomycin MICs are 8 µg/ml, but further studies are needed to define the level of sensitivity of these methods for *S. aureus* for which the vancomycin MICs are 4 µg/ml.

If possible, laboratories that utilize disk diffusion for primary susceptibility testing should incorporate the vancomycin agar screen plate when testing all *S. aureus*. Alternatively, the screening may be limited to methicillin-resistant *S. aureus* (MRSA) isolates, since all VRSA reported worldwide as of March, 2015 were also MRSA.

**Testing Algorithm**
In addition to knowing the appropriate testing methodologies, all laboratories should develop a step-by-step problem-solving procedure or algorithm for detecting VRSA specifically for their laboratory.

All *S. aureus* strains for which the vancomycin is MIC ≥4 µg/ml are unusual and should not be discarded until the MICs have been confirmed. In addition to confirming vancomycin susceptibility, laboratories should ensure that the strain is in pure culture and reconfirm the genus and species of the organism; then, repeat the susceptibility test for vancomycin using a validated method. If retesting confirms a vancomycin MIC ≥4 µg/ml, laboratories should notify infection control. If retesting confirms an MIC ≥8 µg/ml, laboratories should inform the local and/or state health department, as well as the Division of Healthcare Quality Promotion at the Centers for Disease Control and Prevention (CDC) by sending an email to haioutbreak@cdc.gov. The isolate should be sent to UPHL and CDC for confirmatory testing. If the isolate is confirmed by CDC to have reduced susceptibility to vancomycin (MIC ≥ 8 µg/ml), CDC will work with the public health department and infection control personnel to address any local infection control issues, and the health department to address broader public health implications.

CDC will confirm *S. aureus* isolates with a vancomycin MIC of 8 mcg/ml or higher. If VRSA (vancomycin MIC ≥16 µg/ml) is suspected or confirmed, CDC requests that all VRE and VRSA isolates from the patient be saved to allow characterization of the VRSA precursor organisms. After confirmation of VRSA, these organisms should be shared with public health partners, including CDC.
Treatment
Treatment for each case varies, depending on antibiotic susceptibility. To date, all cases of VRSA/VISA have been susceptible to other licensed antibiotics. There is concern, however, about the possibility that an extremely-drug resistant bacteria could emerge from a case of VRSA/VISA.

Case Fatality
If the organism is susceptible to licensed antibiotics, the case fatality should approximate that of non-VRSA/VISA organisms. If the organism is resistant to licensed antibiotics, then case fatality rate could rise.

Reservoir
VISA/VRSA is only found in humans.

Transmission
*S. aureus* is transmitted by close physical contact with infected persons or materials that may carry the organism (e.g., soiled bandages).

Susceptibility
While all people are susceptible to staphylococcal infections, individuals who have had long term antimicrobial therapy for multiply resistant organisms (especially vancomycin-resistant enterococci) are at highest risk of developing this infection. Additionally, individuals with underlying health conditions (such as diabetes or kidney disease) and those with medical devices going into their bodies (such as catheters) may be at higher risk for this type of infection.

Incubation Period
The incubation period for VISA/VRSA is unknown.

Period of Communicability
VISA/VRSA is communicable until the patient has completed appropriate therapy, and until respiratory and skin isolates are proven to be no longer present.

Epidemiology
In May 1996, the first documented infection with vancomycin-intermediate *S. aureus* (VISA; minimum inhibitory concentration [MIC] = 4-8 μg/ml) was reported in a patient in Japan. Subsequently, infections with VISA strains have been reported in patients from the U.S., Europe, and Asia. To date, all VISA examined have had non-transferable resistance mechanisms, which is not maintained in the absence of vancomycin. Furthermore, expression of the VISA phenotype appears to have substantial fitness costs for the organism. For these reasons, VISA is considered less of a public health threat than VRSA.
As of March 2015, 14 VRSA have been reported among patients in the U.S. Geographic clustering has been observed among U.S. VRSA patients, with 8/10 VRSA documented from 2002 to 2009 occurring in patients from Michigan, and all four (4) VRSA infections since 2010 occurring in patients from Delaware. This may be due to a higher prevalence of VRSA precursor organisms in some areas. No VRSA transmission has been documented. All VRSA described to date have acquired the vanA vancomycin-resistance gene and operon, commonly found in vancomycin-resistant enterococci (VRE). VRSA is thought to result from specific precursor organisms: MRSA containing a pSK41-type plasmid and VRE containing vanA encoded on an Inc18-like plasmid.

☑️ PUBLIC HEALTH CONTROL MEASURES

Public Health Responsibility
When VRSA is identified in a clinical laboratory, the patient's primary caregiver, patient-care personnel, and infection control personnel should be notified immediately so that appropriate infection control precautions can be initiated promptly. It is also important to notify local and state public health departments. These notifications should occur while waiting for VRSA confirmatory testing.

- Investigate all suspect cases of disease and complete and submit appropriate disease investigation forms.
- Provide education to the general public, clinicians, and first responders regarding disease transmission and prevention.
- Identify clusters or outbreaks of this disease.
- Identify sources of exposure and stop further transmission.
- Contact the laboratory performing testing to ensure test results are correct. The sample should be sent to the Utah Public Health Laboratory (UPHL) to be sent to CDC for confirmation if MIC $\geq 8 \ \mu g/ml$.

Prevention
The likelihood of acquiring this disease is minimized by judicious use of antibiotics when treating individuals with severe infections, along with appropriate handwashing and other infection control measures.

Chemoprophylaxis
The decision to decolonize a healthcare worker should be made by occupational health services, the infection control team, the healthcare worker, public health, and the worker's personal physician.

The decision to decolonize non-healthcare worker contacts should be made by the contact, their primary care physician, and public health authorities.

Vaccine
None.
Isolation and Quarantine Requirements

**Isolation:** Cases will be strictly isolated. See Case Investigation.

**Hospital:** Hospitals will institute strict infection control policies. See Case Investigation process.

**Quarantine:** Quarantine measures for colonized individuals are possible. See Case Investigation.

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**CASE INVESTIGATION**

**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.

**VISA:** Report any isolation of *S. aureus* from any body site that has a MIC 4–8 μg/ml to vancomycin, as detected and defined according to the CLSI 2009 approved standards and recommendations.

**VRSA:** Report any isolation of *S. aureus* from any body site that has a MIC ≥16 μg/ml to vancomycin, as detected and defined according to the CLSI 2009 approved standards and recommendations.

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

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

**Other recommended reporting procedures**

- All cases of *Staphylococcus aureus* infection/colonization with intermediate resistance, or resistant, to vancomycin should be reported.
- Reporting should be ongoing and routine.
- VISA/VRSA is immediately reportable.
**Table of criteria to determine whether a VISA/VRSA case should be reported to public health authorities**

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical Evidence</strong></td>
<td></td>
</tr>
<tr>
<td>Healthcare record contains a diagnosis of <em>S. aureus</em> infection with intermediate susceptibility to vancomycin</td>
<td>S</td>
</tr>
<tr>
<td>Death certificate lists <em>S. aureus</em> infection with intermediate susceptibility to vancomycin as a cause of death or a significant condition contributing to death</td>
<td>S</td>
</tr>
<tr>
<td><strong>Laboratory Findings</strong></td>
<td></td>
</tr>
<tr>
<td>Isolation of <em>S. aureus</em> from any body site</td>
<td>N</td>
</tr>
<tr>
<td>Intermediate resistance of the <em>S. aureus</em> (VISA) to vancomycin (Minimum Inhibitory Concentration [MIC] 4-8 μg/ml)†</td>
<td>N</td>
</tr>
<tr>
<td>Resistance of the <em>S. aureus</em> (VRSA) isolate to vancomycin (Minimum Inhibitory Concentration [MIC] ≥16 μg/ml)†</td>
<td>N</td>
</tr>
</tbody>
</table>

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).

**Case Definition**

*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**

**VISA**
- Isolation of *S. aureus* from any body site.
  - AND
  - Intermediate susceptibility of the *S. aureus* isolate to vancomycin, detected and defined according to Clinical and Laboratory Standards Institute (CLSI, formerly NCCLS) approved standards and recommendations (Minimum Inhibitory Concentration [MIC] = 4-8 μg/ml).

**VRSA**
- 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] ≥16 μg/ml).
Case Classification
VISA
Confirmed: A case of *S. aureus* that has intermediate susceptibility to vancomycin that is laboratory-confirmed (MIC = 4-8 µg/ml).

VRSA
Confirmed: A case of vancomycin-resistant *S. aureus* that is laboratory-confirmed (MIC ≥16 µg/ml for VRSA).

Classification Table
Criteria for defining a case of VISA/VRSA

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Confirmed VISA</th>
<th>Confirmed VRSA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Laboratory Findings</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isolation of <em>S. aureus</em> from any body site</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Resistance of the <em>S. aureus</em> isolate to vancomycin (Minimum Inhibitory Concentration [MIC] ≥16 µg/ml)†</td>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Intermediate resistance of the <em>S. aureus</em> isolate to vancomycin (Minimum Inhibitory Concentration [MIC] 4–8 µg/ml)†</td>
<td>N</td>
<td></td>
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</tbody>
</table>

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).

Case Investigation Process
VISA
Full case investigations for VISA cases with a MIC <8 µg/ml are not necessary. If the MIC is ≥8 µg/ml, the specimen should be sent to CDC to determine if the vanA gene is present. If vanA gene is present, then a full investigation should take place. Presence of the vanA gene allows the organism to transfer the resistance mechanism to other organisms in the presence of vancomycin. To date, all VISA specimens examined have had non-transferable resistance mechanisms. For these reasons, VISA are considered less of a public health threat than VRSA; however, VISA is still clinically important and laboratories should ensure that treating physicians and infection control are notified of VISA per facility policy.

VRSA
Full case investigations for VRSA cases should be implemented. These include confirmatory testing of suspected isolates, evaluation of the facility’s infection control measures, and assessment of transmission risk to contacts and healthcare workers to determine need for testing of contacts. The following steps below will guide the investigation.

Immediately notify UDOH and the Infection Preventionist at the local healthcare facility.
- All further steps of the case investigation will be carried out with representatives from the CDC, UDOH, Local Health Department (LHD), and hospital.
Vancomycin Resistant (Intermediate) Staphylococcus Aureus (VRSA/VISA): Utah Public Health Disease Investigation Plan

- Develop a written plan to determine infection control actions that will be taken with all individuals whether colonized or infected. This plan must include treatment protocols, follow-up cultures (how and when to obtain), when carriers will be considered free of colonization, and quarantine protocols for carriers. This plan should be written and agreed upon prior to any culture workups of contacts.

- Collect surveillance cultures from patients colonized or infected with VRSA:
  - Culture multiple sites (minimum, two to three sites per patient). Frequently colonized sites such as anterior nares, throat, axilla, groin, or peri-rectal area, and clinically relevant sites such as wounds and drains, should be selected.
  - Consider collecting specimens from sites to determine colonization with vancomycin-resistant enterococci (VRE) carriage status (e.g., rectal, peri-rectal). Any VRE recovered may be of laboratory interest and should be saved for further testing.
  - Any VRSA, MRSA or VRE that are isolated should be saved for further evaluation.

- Persons having extensive interaction (see contact management below) with colonized/infected patient:
  - Culture multiple (e.g., two to three) 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)

- Persons with moderate or minimal interaction (see contact management below):
  - Decisions about culturing those with moderate or minimal interactions should be made in consultation with public health authorities. In general, those with minimal interactions do not require screening unless there is substantial transmission among the other groups.
  - Culture anterior nares, additional body site (groin, axilla, or peri-rectal area), and skin lesions (e.g., abscess or dermatitis, open wounds) should be considered.
  - If no one in this group is identified as colonized with VRSA, do not continue with surveillance cultures for individuals with moderate or minimal interaction.

- If VRSA colonization of contacts is identified OR until the case is no longer colonized or infected:
  - Culture the nares of contacts with extensive interaction (weekly) to assess the efficacy of infection control precautions.

- Place a log book at the entrance of the patient’s room to identify and track patient contacts.

Infection Control
State and/or local public health authorities should notify all healthcare settings attended by the patient during the potential transmission period of the patient’s VRSA colonized/infected status. Below is a checklist of important infection control recommendations. However, these may need to be customized for special healthcare settings (e.g., dialysis, home healthcare). Infection control precautions should remain in place until a pre-defined endpoint (e.g., patient has been culture-negative three times during a period of three weeks or the patient’s infection has healed). This endpoint should be determined in consultation with public health authorities.
Acute Care Settings
1. Isolate the patient in a private room.
2. Minimize the number of persons caring for the patient (e.g., assign dedicated staff to care for VRSA patient).
3. Implement the appropriate infection control precautions during patient care.
   a. Use standard and contact precautions (gown and gloves for room entry).
   b. Wear mask/eye protection or face shield if performing procedures likely to generate splash or splatter (e.g., wound manipulation, suctioning) of VRSA contaminated material (e.g., blood, body fluids, secretions, and excretions).
   c. Perform hand hygiene using appropriate agent (e.g., alcohol-based hand sanitizer or hand washing with plain or antimicrobial soap and water) before entering patient room and upon leaving the room.
   d. Dedicate non-disposable items that cannot be cleaned and disinfected between patients (e.g., adhesive tape, cloth-covered blood pressure cuffs) for use only on the patient with VRSA.
   e. Monitor and strictly enforce compliance with contact precautions.
4. Educate and inform the appropriate personnel about the presence of a patient with VRSA and the need for contact precautions.
5. Facilities should flag the patient’s chart to indicate infection/colonization with VRSA.
6. Consult with the local and/or state health department and CDC before transferring the patient or discharging the patient. Ensure that the patient’s VRSA status and required infection control precautions are communicated at transfer by use of the Interfacility Infection Control Transfer Form (http://health.utah.gov/epi/diseases/HAI/resources/IC_transfer_form.pdf).

Dialysis Settings
To date, four (4) of the 14 U.S. VRSA patients have been hemodialysis patients. Hemodialysis clinics are expected to follow standard precautions and additional infection control recommendations specific to hemodialysis settings. Providers should pay particular attention to the following precautions when caring for a VRSA patient.

1. Wear disposable gown and gloves when caring for the patient or touching the patient’s equipment at the dialysis station; carefully remove and dispose of gown and gloves and perform hand hygiene when leaving patient station.
2. If available, use a separate room that is not in use for hepatitis B isolation for patient treatment. If a separate room is not available, dialyze the patient at a station with as few adjacent stations as possible (e.g., at the end or corner of the unit).
3. Items brought into the dialysis station should be disinfected after use. Items that cannot be disinfected should be discarded.
4. Thoroughly disinfect the dialysis station (e.g., chairs, beds, tables, machines) between patients. Information specific to disinfection in dialysis facilities is available at http://www.cdc.gov/dialysis/PDFs/collaborative/Env_notes_Feb13.pdf and http://www.cdc.gov/dialysis/PDFs/collaborative/Env_checklist-508.pdf.
5. Educate and inform the appropriate personnel about the presence of a patient with VRSA and the need for contact precautions.
6. In the event the patient needs to be admitted or referred to another facility, the receiving

Other Outpatient Settings (primary care physician, wound clinic, etc.)
1. Healthcare providers in outpatient settings should generally follow the same VRSA precautions as hospital-based healthcare providers.
   a. Use standard precautions with strict adherence to hand hygiene.
   b. Use contact precautions (gown and gloves) to enter room/care area if extensive contact is anticipated or contact with infected areas is planned (e.g., debridement or dressing of colonized or infected wound).
   c. Wear mask and eye protection or face shield if performing procedures likely to generate splash or splatter (e.g., wound manipulation, suctioning) of VRSA contaminated material (e.g., blood, body fluids, secretions, and excretions).
   d. Perform hand hygiene using appropriate agent (e.g., alcohol-based hand sanitizer or hand washing with plain or antibacterial soap and water) before entering or leaving the patient’s room.
   e. Dedicate non-disposable items that cannot be cleaned and disinfected between patients (e.g., adhesive tape, cloth-covered blood pressure cuffs) for use only on the patient with VRSA.
2. Minimize the number of persons who care for the VRSA colonized/infected patient (e.g., dedicate a single staff person).
4. Educate and inform the appropriate personnel about the presence of a patient with VRSA and the need for contact precautions.
5. In the event the patient needs to be admitted or referred to another facility the receiving facility must be notified of the patient’s VRSA status by use of the Interfacility Infection Control Transfer Form. (http://health.utah.gov/epi/diseases/HAI/resources/IC_transfer_form.pdf).

Home Healthcare Settings
1. Home healthcare providers should generally follow the same VRSA precautions as hospital-based healthcare providers.
   a. Wear gown and gloves upon entering the area of house where the patient care will be provided.
   b. Wear mask and eye protection or face shield if performing procedures likely to generate splash or splatter (e.g., wound manipulation, suctioning) of VRSA contaminated material (e.g., blood, body fluids, secretions, and excretions).
   c. Perform hand hygiene using appropriate agent (e.g., alcohol-based hand sanitizer or hand washing with plain or antibacterial soap and water) before entering patient area and upon leaving the area.
2. Minimize the number of persons with access to the VRSA colonized/infected patient (e.g., dedicate a single staff person to care for this patient).
3. Dedicate non-disposable items that cannot be cleaned and disinfected between patients (e.g., cloth-covered blood pressure cuffs) for use only on a single patient.

**Outbreaks**

An outbreak is defined as a single case of VRSA in Utah. VISA cases will be investigated as outbreaks if there is suspicion that transmission has occurred.

**Identifying Case Contacts**

Contacts should be categorized based on their level of interaction (e.g., extensive, moderate, or minimal) with the colonized or infected patient. **Priority should be given to identifying contacts that have had extensive interaction with the VRSA patient during a defined period before the VRSA positive culture date.** The length of this period depends on recent culture results, the setting in which the patient received healthcare, and the clinical assessment. For patients with multiple recent cultures, the time from last vancomycin-susceptible culture to first vancomycin-resistant culture can be considered the period from which contacts should be identified.

<table>
<thead>
<tr>
<th>Contacts defined as having Extensive Interaction with a VRSA patient</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Patients who:</strong></td>
</tr>
<tr>
<td>• Share the VRSA patient’s room.</td>
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<tr>
<td><strong>B. Nursing or patient-care providers involved in direct patient care who:</strong></td>
</tr>
<tr>
<td>• Clean/bathe/rotate/ambulate the patient or have other prolonged contact.</td>
</tr>
<tr>
<td>• Change dressings.</td>
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<tr>
<td>• Make frequent visits (&gt;3 visits per shift).</td>
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<tr>
<td>• Handle secretions and body fluids, including respiratory secretions.</td>
</tr>
<tr>
<td>• Manipulate intravenous lines.</td>
</tr>
<tr>
<td><strong>C. Physicians who:</strong></td>
</tr>
<tr>
<td>• Care for wound dressings or perform debridement (outside of Operating Room).</td>
</tr>
<tr>
<td>• Conduct extensive exams on the VRSA patient.</td>
</tr>
<tr>
<td><strong>D. Ancillary staff who:</strong></td>
</tr>
<tr>
<td>• Have prolonged physical patient contact, including physical therapy or rehabilitation personnel, dialysis or respiratory technicians, and home health aides.</td>
</tr>
<tr>
<td><strong>E. Family members or household contacts who:</strong></td>
</tr>
<tr>
<td>• Provide primary care.</td>
</tr>
<tr>
<td>• Had/have close physical contact with patient or their immediate environment (e.g., sleep in the same bed or same room).</td>
</tr>
</tbody>
</table>
Contacts defined as having **Moderate Interaction** with a VRSA patient

<table>
<thead>
<tr>
<th>A. Patients</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>• Share patient care areas and healthcare providers for extended periods with the VRSA patient (e.g., patients receiving dialysis on same shift as VRSA patient or hospitalized in a different room, but with same providers while patient not in Contact Precautions).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Nursing or patient-care providers who:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Deliver medications.</td>
<td></td>
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<tr>
<td>• Cross-cover patient only.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>C. Physicians who:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• See patient on daily rounds, without conducting extensive exams.</td>
<td></td>
</tr>
<tr>
<td>• Perform surgical or invasive procedures where sterile barriers or aseptic techniques are used.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D. Ancillary staff who:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Have limited interactions (e.g., radiology technicians).</td>
<td></td>
</tr>
</tbody>
</table>

Contacts defined as having **Minimal Interaction** with a VRSA patient

<table>
<thead>
<tr>
<th>A. Patients</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>• On same ward, but for short periods of time or while patient in Contact Precautions.</td>
<td></td>
</tr>
<tr>
<td>• Seen in same outpatient clinic on same day as patient.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Nursing or patient-care providers who:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Work on the same floor without formal cross-coverage of patient.</td>
<td></td>
</tr>
<tr>
<td>• Perform predominately administrative duties.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C. Physicians who:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Consult infrequently without extensive exam.</td>
<td></td>
</tr>
<tr>
<td>• Visit during teaching rounds only.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D. Ancillary staff who:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Monitor patient-care equipment without handling secretions.</td>
<td></td>
</tr>
<tr>
<td>• Provide dietary or maintenance services and do not interact directly with the patient.</td>
<td></td>
</tr>
</tbody>
</table>
Case Contact Management

Contact investigations for VISA cases are not routinely recommended unless there is suspicion that transmission has occurred (e.g., outbreak). Contact investigations during an outbreak will follow VRSA contact investigation steps.

In contrast, VRSA strains [vancomycin MIC ≥16 µg/ml] are characterized by expression of vanA acquired from an Enterococcus spp; therefore, this resistance is potentially transferable to susceptible strains or other organisms. Contact investigations for VRSA cases are recommended.

REFERENCES


VERSION CONTROL

12.7.2015: Updated reported case numbers. Updated case and contact investigation procedures. Updated formatting.
### UT-NEDSS Minimum/Required Fields by Tab

#### Demographic
- First Name
- Last Name
- Age
- Date of Birth
- Date of Death
- Phone Number
- Area code
- County
- Birth Gender
- Race
- Street
- City
- State
- Zip Code

#### Clinical
- Admission Date
- Clinician First Name
- Clinician Last Name
- Clinician Phone
- Date Diagnosed
- Died
- Date of Death
- Diagnostic Facility
- Disease
- Health Facility
- Hospitalized
- Onset Date

#### Laboratory
- Collection date
- Lab
- Organism
- Result Value
- Specimen Source
- Test Result
- Test Type
- Units

#### Epidemiological
- Date of Exposure
- Exposure City
- Exposure Name
- Exposure place type
- Food Handler
- Group Living
- Health Care Worker
- Imported From
- Other Data 1
- Other Data 2

#### Investigation
- Had a fever and pneumonia
- Other relevant details:
  - Date patient admitted to reporting facility?
  - Was patient transferred from another facility?
  - Where transferred from?
  - Type of facility patient was transferred from:
  - Date of transfer:
  - Was this infection healthcare facility acquired?
  - Has the healthcare facility taken measures to prevent further spread of organism, if warranted?

#### Contacts
- NA

#### Reporting
- Date first reported to public health

#### Administrative
- LHD investigation/intervention started
- Outbreak Associated
- Outbreak Name
- State Case Status