



Investigation and Control of
Vancomycin- Resistant
Staphylococcus aureus (VRSA):
2015 Update

Division of Healthcare Quality Promotion
Centers for Disease Control and Prevention
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DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

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Resources:

CDC Information on Healthcare-Associated Infections: <http://www.cdc.gov/hai/>

CDC VRSA webpage: http://www.cdc.gov/HAI/organisms/visa_vrsa/visa_vrsa.html

MASTER Laboratory Training: http://www.cdc.gov/labtraining/master_courses.html

Reporting and Confirmatory Testing

To report or request testing of suspected VRSA, send an email to haioutbreak@cdc.gov with your contact information (i.e., name, facility or laboratory name, telephone number, and susceptibility results including MIC and test method). Unless special circumstances exist, CDC will evaluate *S. aureus* isolates with a vancomycin minimum inhibitory concentration (MIC) of 8 mcg/ml or higher.

Overview

This document is a guide to conducting a public health investigation of patients from whom vancomycin-resistant *Staphylococcus aureus* (VRSA, vancomycin MIC ≥ 16 $\mu\text{g/ml}$) has been isolated. The information reflects the experience gained from field investigations of the first fourteen VRSA identified in the United States.

At the time of the introduction of penicillin in the early 1940s, *S. aureus* was uniformly susceptible to this drug. However, widespread resistance to penicillin developed during the 1950s, followed in the 1970s by increasing resistance to the new semisynthetic penicillinase-resistant antimicrobial agents (i.e., methicillin, oxacillin, nafcillin, dicloxacillin). By the 1990s, resistance to the penicillinase-resistant penicillins had spread throughout the world, compromising the use of these drugs for empiric therapy for staphylococcal infections. This has led to increased reliance on vancomycin for treatment of documented methicillin-resistant *S. aureus* (MRSA) infections, as well as for empiric therapy of infections in populations where the prevalence of MRSA is high.

Reports in the 1990s suggested that the susceptibility of *S. aureus* to vancomycin was changing. In May 1996, the first documented infection with vancomycin-intermediate *S. aureus* (VISA; minimum inhibitory concentration [MIC] = 4-8 $\mu\text{g/ml}$) was reported in a patient in Japan. Subsequently, infections with VISA strains have been reported in patients from the United States, Europe, and Asia. To date, all VISA examined have had non-transferable resistance mechanisms, which are 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 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.

As of May 2015, fourteen VRSA infections have been reported in patients from the United States. 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. Geographic clustering has been observed among U.S. VRSA patients, with eight of ten VRSA documented from 2002 to 2009 occurring in patients from Michigan and all four 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.

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

S. aureus isolates with a vancomycin minimum inhibitory concentration (MIC) of 8 mcg/ml or higher should be submitted to CDC for confirmation of susceptibility results. If VRSA (vancomycin MIC ≥ 16 $\mu\text{g/ml}$) is suspected or confirmed, CDC requests that all VRE, MRSA, 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.

Definitions

CDC definitions for classifying isolates of *S. aureus* with reduced susceptibility to vancomycin are based on the laboratory breakpoints established by the Clinical and Laboratory Standards Institute (CLSI). The CLSI breakpoints for *S. aureus* and vancomycin were last modified in 2009.

Vancomycin-susceptible *S. aureus* (VSSA)

- Vancomycin MIC ≤ 2 $\mu\text{g/ml}$

Vancomycin-intermediate *S. aureus* (VISA)

- Vancomycin MIC =4-8 $\mu\text{g/ml}$.

Vancomycin-resistant *S. aureus* (VRSA)

- Vancomycin MIC ≥ 16 $\mu\text{g/ml}$.

*Note: The breakpoints for *S. aureus* and vancomycin differ from those for other *Staphylococcus* species. (2015 CLSI M100-S25).*

Laboratory Surveillance and Diagnostics Issues

Testing Difficulties

Detecting emerging antimicrobial resistance in bacterial isolates can sometimes be problematic, especially in highly automated clinical microbiology laboratories. In the following section, we describe some steps laboratories may take to improve their ability to detect emerging vancomycin resistance in *S. aureus*.

Testing Recommendations

All automated susceptibility testing (AST) systems currently approved for use in the United States can reliably detect VRSA. 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 (i.e., 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.

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 MIC is ≥ 4 µg/ml are unusual and should not be discarded until the MICs have been confirmed by a validated method. In addition, laboratories should ensure that the strain is in pure culture and confirm the organism identification. If retesting confirms identity, purity and a vancomycin MIC ≥ 4 µg/ml, laboratories should notify infection control. For isolates with an MIC ≥ 8 µg/ml, laboratories should also inform the local and/or state health department, if required, as well as the Division of Healthcare Quality Promotion at CDC by sending an email to haioutbreak@cdc.gov. The isolate should be sent to the health department and/or CDC for confirmation by a reference method. 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, including the state antimicrobial resistance program, and infection control personnel to address any local infection control issues, and the health department to address broader public health implications.

Using Vancomycin Agar Screen Plates

The vancomycin agar screen test uses **commercially prepared** plates containing brain heart infusion (BHI) agar and 6 µg/ml of vancomycin to screen pure cultures of bacteria for vancomycin resistance. Commercially-

Commercially-prepared plates that contain BHI agar and 6µg/ml of vancomycin may be used for screening.

prepared plates are preferred because adequate quality control of the agar test medium is critical. In studies conducted at CDC, some lots of vancomycin-containing BHI agar prepared in-house were less specific than plates prepared commercially and allowed growth of the susceptible quality control strains. A 10 µl inoculum of a 0.5 McFarland suspension should be spotted on the agar using a micropipette (final concentration 10⁶ colony-forming units [CFUs]/ml). Alternatively, a swab may be dipped in the 0.5 McFarland suspension, the excess liquid expressed, and used to inoculate the vancomycin agar screen plate. For quality control, laboratories should use *Enterococcus faecalis* ATCC 29212 as the susceptible control and *E. faecalis* ATCC 51299 as the resistant control. Up to eight isolates can be tested per plate; quality control should be performed each day of testing. Growth of more than one colony is considered a positive result. All *S. aureus* isolates for which the vancomycin MIC ≥8 µg/ml grow on these plates and some isolates for which the vancomycin MIC=4 µg/ml will also grow. Ultimately, all staphylococci that grow on these plates should be inspected for purity, and the original clinical isolates should be tested using an FDA-cleared MIC method for confirmation.

Confirmatory Testing Methods Used by CDC

CDC defines *S. aureus* strains as a VISA or VRSA based on the MIC for vancomycin obtained by reference broth microdilution. Additionally, CDC tests all presumptive VISA/VRSA isolates by gradient diffusion. Isolates confirmed as VRSA at CDC are further examined by PCR. Email haioutbreak@cdc.gov for information on how to send isolates to CDC for testing.

Technique	VRSA Results	VISA Results	Comment
Reference Broth Microdilution	VA* MIC ≥16 µg/ml in cation-adjusted Mueller-Hinton broth	VA MIC = 4 – 8 µg/ml in cation-adjusted Mueller-Hinton broth	Incubate test for full 24 hrs.
Commercially-prepared Brain Heart Infusion Agar containing 6 µg/ml of vancomycin	Growth of >1 colony in 24 hrs.	Growth of >1 colony in 24 hrs.	Two or more colonies is a positive result; For QC* use <i>Enterococcus faecalis</i> ATCC 29212 as susceptible control and <i>E. faecalis</i> ATCC 51299 as resistant control
Gradient diffusion (e.g., Etest®)	VA MIC ≥16 µg/ml on Mueller-Hinton agar	VA MIC= 4 – 8 µg/ml on Mueller-Hinton agar	Use a 0.5 McFarland standard to prepare the inoculum suspension. Incubate test for full 24 hrs.

*VA, vancomycin; QC, quality control

Contact Investigation

Detection of VRSA, given the public health importance, should trigger an investigation that includes a contact investigation regardless of whether transmission is suspected. VRSA strains [vancomycin MIC ≥ 16 $\mu\text{g/ml}$] 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, a contact investigation following detection of VISA is only recommended if VISA transmission is suspected.

This section discusses how and where to obtain specimens from the contacts of a patient infected or colonized with VRSA. The contact investigation plan should be developed in consultation with public health authorities, as activities may extend beyond the facility where the VRSA was identified.

Step 1: Develop a plan for VRSA colonized or infected individuals

Before any culturing of contacts of VRSA patients is performed, a plan should be developed outlining how VRSA colonized or infected individuals will be handled. Issues that should be considered include:

- Will any colonized or infected people be offered decolonization and if so what regimen will be used?
- Will follow up cultures be obtained?
- When will the individual be considered free of colonization (e.g., 3 negative cultures over 3 weeks post therapy)?
- Will colonized or infected healthcare personnel be allowed to work (e.g., if a healthcare worker is positive for MRSA or VRSA will they be removed from patient-care activities and, if yes, under what circumstances and when can they return to work)?
- How will VRSA patients be identified at readmission?

Step 2: Identify and categorize contacts

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.** 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. Examples of persons having extensive, moderate, and minimal interactions are listed on pages 9-10.

Contacts defined as having Extensive Interaction with a VRSA patient

A. Patients who:

- Share the VRSA patient's room

B. Nursing or patient-care providers involved in direct patient care who:

- Clean/bathe/rotate/ambulate the patient or have other prolonged contact
- Change dressings
- Make frequent visits (>3 visits per shift)
- Handle secretions and body fluids, including respiratory secretions
- Manipulate intravenous lines

C. Physicians who:

- Care for wound dressings or perform debridement (outside of Operating Room)
- Conduct extensive exams on the VRSA patient

D. Ancillary staff who:

- Have prolonged physical patient contact, including physical therapy or rehabilitation personnel, dialysis or respiratory technicians, and home health aides

E. Family members or household contacts who:

- Provide primary care
- Had/have prolonged close physical contact with patient or their immediate environment (e.g., sleep in the same bed, or same room)

Contacts defined as having Moderate Interaction with a VRSA patient

A. Patients who:

- 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 for several days while patient not in Contact Precautions)

B. Nursing or patient-care providers who:

- Deliver medications
- Cross-cover patient only

C. Physicians who:

- See patient on daily rounds, without conducting extensive exams
- Perform surgical or invasive procedures where sterile barriers or aseptic techniques are used

D. Ancillary staff who:

- Have limited interactions (e.g., radiology technicians)

E. Family members or household contacts who:

- Live with or have physical contact with the VRSA patient but do not meet the criteria for

Contacts defined as having Moderate Interaction with a VRSA patient

extensive interaction

Contacts defined as having Minimal Interaction with a VRSA patient

A. Patients

- On same ward but for short periods of time or while patient in CP
- Seen in same outpatient clinic on same day as patient

B. Nursing or patient-care providers who:

- Work on the same floor without formal cross-coverage of patient
- Perform predominately administrative duties

C. Physicians who:

- Consult infrequently without extensive exam
- Visit during teaching rounds only

D. Ancillary staff who:

- Monitor patient-care equipment and do not have known contact with secretions
- Provide dietary or maintenance services and do not interact directly with the patient

Step 3: Specimen Collection

Clinical laboratories that routinely use rapid polymerase-chain reaction (PCR) assays for detection of MRSA from surveillance swabs will need to utilize culture-based methods so that vancomycin susceptibilities can be determined. Prior to collecting specimens, verbal consent from each contact should be obtained. An example consent script is in Appendix 1.

From patients colonized or infected with VRSA (*e.g.*, the index patient):

- Culture multiple sites (minimum, 2 to 3 sites per patient). Both frequently colonized sites such as anterior nares, throat, axilla, groin, or perirectal 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 (*i.e.*, 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.

From persons having extensive interaction with colonized/infected patient:

- Culture 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).

From persons with moderate or minimal interaction:

- 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 of anterior nares, additional body site (groin, axilla, or peri-rectal area), and skin lesions (e.g., abscess or dermatitis, open wounds) should be considered.

Step 4: Evaluate Efficacy of Infection Control Precautions

Infection control practices, particularly adherence to hand hygiene and contact precautions, should be assessed at facilities that are caring for VRSA patients. Facilities that might care for the patient (e.g., acute care hospitals if patient is outpatient) should be notified so that they can “flag” the patient’s record so that in case of admission appropriate infection control precautions will be put into place. Hospitalized patients with VRSA should be put on standard and contact precautions.

Laboratory Processing of Specimens

Step 1: Processing surveillance specimens for *Staphylococcus aureus*

- Inoculate the swab into trypticase soy broth containing 6.5% sodium chloride and incubate overnight at 35° C. Following overnight incubation, subculture the broth onto mannitol salt agar (MSA) (i.e., swabbed over the first quadrant while rotating the swab, then streaked for isolation) and incubate at 35°C. The MSA plate should be examined daily for *S. aureus* for 72 hr; *S. aureus* will appear as gold or yellow colonies. Presumptive *S. aureus* should be sub-cultured onto blood agar plates and identified using standard laboratory methodology.
- Alternatively, screening plates designed to isolate only MRSA (e.g., MRSA chromogenic agar) may be used, but definitive identification of isolates as *S. aureus* is still recommended.
- After specimen identification is complete, proceed to step 2.

Step 2: Detecting VRSA

- After identification of isolates as *S. aureus* or MRSA, laboratories should perform susceptibility testing using a validated MIC method or vancomycin screen plates if a large number of isolates are being processed (see page 7).
- If *S. aureus* isolates show reduced susceptibility to vancomycin (MIC ≥ 4 $\mu\text{g/ml}$), health departments should be notified where such isolates are reportable. The CDC should be contacted for confirmatory and susceptibility testing of isolates with MIC ≥ 8 $\mu\text{g/ml}$ by sending an email to haioutbreak@cdc.gov.

Decolonization in VRSA Carriers

Some patients, healthcare workers, or family members may be identified as colonized with VRSA during a contact investigation. Colonization refers to the presence of microorganisms in or on a person who does not have clinical signs or symptoms of infection. A patient may be simultaneously VRSA-infected and VRSA-colonized (such as by having a VRSA wound infection and VRSA colonization of the nares). Decolonization refers to reducing the organism burden on the colonized person with the goal of eradicating the organism. The rationale is that by decreasing the reservoir of VRSA, the risks of infection and of transmission of the organism are reduced.

The decision to attempt decolonization therapy is based upon a number of considerations, including: 1) the individual's underlying disease and/or immune status; 2) the ability of the individual to tolerate the recommended regimen; 3) the risk of transmission to others. Decisions about decolonization should be made in consultation with the patient's physician and public health authorities (e.g., local and/or state health department and state AR program).

Overview of nasal decolonization treatment:

If the decision is made to decolonize, a number of regimens to eliminate *S. aureus* colonization are available that have been used in healthcare settings to control MRSA. However, a limited number of antimicrobial agents are available for the eradication of *S. aureus* colonization. These regimens have included various combinations of topical and systemic antimicrobial agents and antiseptic body washes and have typically been used as part of multi-faceted infection control interventions, making it difficult to evaluate the effectiveness of any individual component. Mupirocin, a topical antimicrobial with antistaphylococcal activity, is usually the agent of choice for eradication of staphylococcal nasal colonization in patients and healthcare workers during localized MRSA outbreaks. Data from healthcare settings indicate that intranasal mupirocin can be effective at eliminating *S. aureus* colonization in the short term; however, recolonization is common. For patients able to tolerate it, topical chlorhexidine gluconate has generally been used daily with mupirocin to eliminate carriage of *S. aureus*. One regimen that has been used includes intranasal mupirocin BID for 5 to 7 days with daily chlorhexidine body washes for a similar time period. Contraindications as well as local resistance patterns to decolonization agents should be considered when selecting a regimen.

Infection Control Issues

State and/or local health authorities, such as the state antimicrobial resistance program, 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 3 times over 3 weeks or the patient's infection has healed). This endpoint should be determined in consultation with public health authorities.

For assistance, contact CDC's Division of Healthcare Quality Promotion by sending an email to haioutbreak@cdc.gov.

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. Per standard precautions, wear facemask 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 antimicrobial soap and water).
 - 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 healthcare 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.
7. Ensure that the patient's VRSA status and required infection control precautions are communicated at transfer

Dialysis Settings

To date, four 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 not able to 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 facility must be notified of the patient's VRSA status.

Other Outpatient Settings (e.g., primary care, wound clinic)

1. Healthcare providers in outpatient settings should 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. Per Standard Precautions, 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).
 - 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).
3. Ensure meticulous cleaning of the room/patient care area at the end of each visit.
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.

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. Per standard precautions, 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).
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.

The risk of transmission to household members, even those with extensive contact, is extremely low. Household members should practice good hand hygiene (frequent hand washing with soap and water or use of alcohol-based hand rubs). Additionally, if household members are providing care to the VRSA patient (such as changing the dressing on an infected wound), these persons should follow the same precautions as listed for home health care.

Additional Reading

Infection Control

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Appendix 1: Example Verbal Consent for Surveillance (Nasal and Groin) Swabs

Hello, my name is (insert name) and I am from the (organization). As you may know, someone you might have been exposed to has been found to carry a germ that is a bacteria called vancomycin-resistant *Staphylococcus aureus* or VRSA. VRSA is highly-antibiotic resistant, meaning that many medicines do not kill this bacteria. This organism is very rare in the United States – so far only XX people in the US have had the bacteria.

The risk to you from these bacteria is very low. So far the bacteria have never spread to any of the contacts of the other people that had the bacteria. However, the Health Department would like to be sure that this bacteria has not spread to anyone else. Healthy people can have this bacteria living on their skin or in their nose and not become sick. In order to make sure this bacteria does not spread further, the Health Department is contacting people that might have had contact with this person to perform a test to make sure they are not also carrying the bacteria.

In order to do this, we would like to swab your nose and groin to see if the bacteria are present. The process is simple; we will gently rub the inside of both nostrils with a soft swab that looks like a Q-tip. We would also like to swab the area where your leg joins your abdomen (groin). If you are uncomfortable with us doing this we can give you the swab for you to do this yourself. The procedure is not painful and does not have harmful side effects. The swabs will be sent to the State Public Health Laboratory to see if the bacteria are present. If the bacteria are present, someone from the Health Department will contact you to discuss what to do next.

Consenting to these swabs is completely voluntary. There are no consequences for choosing not to do this. You can also choose to do just one of the swabs if you prefer although, one swab is not as good at finding the bacteria compared with two swabs. The test results of the cultures will be kept confidential to the extent allowed by law.

Do you have any questions? Is it OK if we collect the swabs?