Infection Prevention and Control of Vancomycin-Resistant Enterococci (VRE) in Western Australian Acute Care Healthcare Facilities

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Acknowledgements
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Introduction

These guidelines represent the minimum requirements for the screening and management of patients with VRE. They are to be implemented by all acute care public hospitals and private healthcare facilities contracted to provide care for public patients, including private haemodialysis units in Western Australia (WA). Additional measures may be required in some facilities on advice from their infection prevention and control professionals. This document is not intended for use in residential care facilities (RCFs).

Identification of patient populations at risk of acquiring VRE and performing routine screening has been shown to be a cost effective infection prevention management approach. The strict adherence to standard precautions and the adoption of transmission-based contact precautions when VRE colonisation or infection is identified is the appropriate management for VRE positive patients.

*At no time shall a person’s VRE status interfere with the admission to, or provision of, appropriate healthcare in any WA healthcare facility.*

Risk Assessment

All patients known or found to be colonised or infected with VRE must be assessed individually for risk factors for transmission. In certain circumstances, VRE positive patients who have no risk factors for transmission may be managed with modified transmission-based precautions depending on the type of HCF they are attending and on the advice of their infection prevention and control professional.

Definitions

**Carrier** refers to any patient who has had VRE isolated from any site.

**Colonisation** is the presence, growth and multiplication of microorganisms without observable clinical signs or symptoms of infection. Enterococci are not a cause of diarrhoea, so if isolated from a faecal specimen collected from a patient with diarrhoea, this is colonisation and not infection.

**Contact** refers to any patient who has been in close contact (i.e. shared a room or bathroom-toilet facility) with a VRE carrier for whom no transmission-based precautions were in place. HCFs may choose to broaden the definition to include additional patients depending on the facility design and patient / ward casemix e.g. high risk ward, VRE patient with risk factors for dissemination or during an outbreak.

**Healthcare facility (HCF)** for the purpose of this document, this includes all public hospitals, private hospitals contracted to provide care for public patients, and private haemodialysis units.

**Infection** refers to invasion of bacteria into tissues with replication of the organism. Infection is characterised by isolation of the organism accompanied by clinical signs of illness such as fever, inflammation or pus formation.
Characteristics

VRE have emerged as important pathogens that contribute to healthcare-associated infections.

Reservoir

- Enterococci are part of the normal flora of the lower gastro-intestinal tract and can be found at other body sites such as skin surfaces, vagina, urethra and the hepatobiliary tree.
- VRE is found in the faeces of colonised people.
- Most patients who acquire VRE are colonised rather than infected.
- Enterococci are capable of prolonged (months) survival on environmental surfaces.

Risk Factors for Acquisition (colonisation or infection)

- Certain patients have an increased risk for acquiring VRE, including:
  - critically ill patients requiring intensive care
  - patients with severe underlying disease
  - patients with immunosuppression
  - patients who have had prolonged hospitalisation
  - patients with invasive devices
  - patients with previous or current antibiotic exposure (particularly vancomycin or broad spectrum agents)
  - patients in proximity to a VRE colonised / infected patient.

Risk Factors for Transmission

- Certain VRE patients are more likely to contaminate the environment and hands of healthcare worker (HCWs). These include:
  - patients with diarrhoea or faecal incontinence
  - patients with enterostomies
  - patients with discharging wounds
  - catheterised patients with VRE colonisation of the urinary tract
  - patients incapable of maintaining own personal hygiene.
- HCWs providing direct care to these patients are at increased risk of transient acquisition of VRE on their hands if standard and transmission based precautions are not followed.

Routes of Transmission

- The routes of transmission from patient to patient are either by:
  - direct contact through transient carriage of VRE on the hands of HCWs or
  - indirectly via contaminated environmental surfaces or shared equipment.
Infection Prevention and Control

1. Screening Requirements

The following patients will have routine VRE screening performed by obtaining one specimen as described in section 2.

NOTE: No pre-emptive isolation is required pending screening results.

1.1 General Patients

- Any person who has been a hospital inpatient in a HCF or a resident in a RCF outside of WA in the past 12 months shall be screened for VRE prior to admission, or on admission, to a WA HCF.
- Any patient who is a direct transfer from a HCF or RCF outside of WA shall be screened on admission to a WA HCF.

1.2 Haemodialysis Units

- All incentre haemodialysis patients shall be screened for VRE on initial admission to the Unit.
- All haemodialysis patients (incentre and satellite) are to be screened following dialysis provided outside of WA.
- Routine three monthly screening is recommended for all haemodialysis patients, excluding home-based haemodialysis patients, who are to be screened when admitted to an incentre.
- A copy of the patient’s most recent screening result shall be made available when transferring them between units. If a patient has been screened within the last 3 months, the patient does not require rescreening prior to transfer.
- More frequent surveillance screening may be implemented at a local level on the advice of infection prevention and control teams e.g. in the event of an outbreak.

1.3 Specialised Units

- Specialised units, which are those identified as high risk for VRE acquisition and the development of invasive infections, include intensive care, haematology, oncology and transplant units.
- Screening protocols for these units need to be developed by each HCF.
- It is recommended that patients in these units are screened for VRE on admission to the unit. For patients with a length of stay greater than one week, screening is recommended weekly and on discharge.

2. Specimen Collection

- Collect one faecal specimen in a clean specimen container or a perianal or rectal swab
- The procedure for collecting perianal or rectal swabs is as follows:
  - dip a sterile cotton swab in sterile water or normal saline
  - rotate swab around the anal area or
  - insert swab 1cm into rectum and gently rotate 360°
  - place swab into transport container and process as per normal procedure.
All laboratory request forms to be marked “For VRE Screening.”

3. Clearance Screening
- There is no screening protocol to clear VRE-positive patients in WA and routine screening of positive patients is not required.
- Clearance screening specifically for patients identified as a ‘contact’ is achieved by the collection of three specimens collected on three separate days.
- Clearance swabs of ‘contacts’ can be collected during antibiotic treatment.

4. Antimicrobial Stewardship
- All WA HCFs shall have a ‘vancomycin restricted use’ policy and a monitoring process to ensure compliance with the policy.
- Vancomycin shall only be used on the prescription or recommendation of a Clinical Microbiologist, Infectious Diseases Physician, Intensivist or within protocols approved by such specialists for specific units.

6. Routine Environmental and Equipment Cleaning
- The importance of regular routine cleaning and disinfection (when required) of the environment and shared equipment in accordance with standard precautions is critical in the prevention of transmission of microorganisms. All HCFs shall ensure:
  - documented cleaning schedules for all areas of the HCF are available
  - routine cleaning is performed in all areas on a daily basis
  - high risk areas are identified and implement increased cleaning regimens e.g. shared toilet facilities
  - documented procedures are available to render shared equipment safe for reuse on other patients.

7. Surveillance and Notification
- Microbiological surveillance is required by all pathology laboratories. Testing of clinically significant enterococcal isolates for vancomycin sensitivity and the use of media selective for VRE in examination of all faecal specimens from in-patients submitted for culture should occur.
- All laboratories isolating VRE shall ensure prompt notification is made to the medical practitioner responsible for the care of the patient. In the case of an admitted patient, notification should be made to the hospital infection prevention and control personnel, the nurse in charge of the ward or unit and other personnel as specified at a local HCF level.
- All VRE isolates are to be sent to the Australian Collaborating Centre for Enterococcus and Staphylococcus Species (ACCESS) Typing and Research.
- Each HCF shall ensure local data collection of all VRE isolates occurs, including patient demographics, ward location and any identified patient contacts.

8. Micro-Alert System
- Patients positive for VRE are to be assigned a ‘V’ alert on the Micro-Alert System.
- Patients positive for VRE will be provided with written information (appendix 1).
As carriage of VRE can be prolonged and there is no clearance procedure, ‘V’ alerts are to remain in place for the life of the patient.

Micro-Alert ‘F’ is to be initiated for those patients identified as a contact and for whom screening has not been undertaken or completed prior to discharge.

9. Outbreak Management

An outbreak is defined as two or more epidemiologically-linked cases (either infection or colonisation) within the one HCF.

All HCFs shall have an outbreak management plan to ensure prompt action is taken to identify the source, stop further spread and ensure communication occurs between all concerned parties.

All HCFs shall notify an outbreak of VRE to the Healthcare Associated Infection Unit within the Communicable Disease Control Directorate.

10. Management of VRE Positive Patients (Hospital Inpatient)

Transmission-based contact precautions are required for VRE positive patients.

An individual patient risk assessment is required when VRE positive status is confirmed to assess patient risk factors for transmission.

In some circumstances, it may be appropriate to manage VRE positive patients with standard precautions and modified contact precautions if the patient has no risk factors for transmission and no antimicrobial therapy is prescribed. This needs to be determined at an individual HCF level by staff with infection prevention and control expertise and responsibility.

10.1 Patient Placement

Single room, non-carpeted with ensuite facilities is preferred.

A hand basin should be inside, or in close proximity to, the room.

If there are two or more cases and no single rooms are available, shared cohorts of confirmed positive cases can be established.

10.2 Room Preparation

Remove all non essential equipment.

Ensure impermeable mattress and pillow covers are intact.

Patient charts shall be left outside the patient room.

Personal protective equipment (PPE) supplies are to be available outside the room (refer 10.4 for PPE requirements).

Signage advising of contact precautions shall be evident outside the room.

10.3 Hand Hygiene

All patients and visitors shall be advised (via signage) on the importance of performing hand hygiene and alcohol-based hand rubs (ABHRs) made available for their use.

HCWs shall use an ABHR or antiseptic hand wash for all hand hygiene.

All HCWs shall perform hand hygiene in accordance with the ‘5 moments of hand hygiene’ standard.
In addition, the requirements for performing hand hygiene associated with donning and removing PPE shall be followed.

Gloves are not a substitute for hand hygiene and improper use of gloves has been associated with VRE transmission.

Hand hygiene must always be performed after removal of gloves.

10.4 Personal Protective Equipment

Contact precautions require the HCW to don gown and gloves prior to entering a room if contact with the patient or environment is anticipated.

Disposable long-sleeved, fluid resistant gowns are preferred. If not available, utilise cloth gowns with the addition of a plastic apron. They are for single use only and are not to be left hanging in the patient’s room for use on subsequent occasions.

When gloves are worn, avoid touching and therefore contaminating environmental surfaces e.g. light switches, door handles.

Prior to leaving the patient’s room, gown and gloves are to be removed and hand hygiene performed.

As per standard precautions, masks and eyewear are required in addition to gown and gloves whenever there is potential for exposure to blood and or body fluids.

10.5 Patient Equipment

Disposable, single-use patient care equipment is preferred, whenever possible.

Dedicate non-critical items to the patient’s room e.g. stethoscope.

Minimal stocks of disposable items (e.g. dressings, kidney dishes) are to be stored in the room. On patient discharge, these items are to be discarded.

Equipment that is designated reusable and required for use on other patients shall be cleaned and disinfected prior to leaving the room.

Disinfectant wipes may be used for specialised medical equipment e.g. x-ray and ECG machines.

Items requiring further reprocessing (e.g. sterilisation) should be processed as per normal.

Used bedpans / urinals / measuring jugs shall be sanitised in a pan sanitiser immediately following use, or disposed of in a macerator.

10.6 Environmental Cleaning

Cleaning regimens shall ensure the room is cleaned on a daily basis and on patient discharge.

Cleaning regimens must include all horizontal surfaces, walls that are visibly contaminated, and frequently touched items such as door handles, bed rails, bedside lockers, over-bed table, call bell, IV poles, telephone, TV remote, monitors and bathroom and toilet amenities, including hand basin fittings.

Increased cleaning is recommended if the patient has risk factors for dissemination, such as diarrhoea or incontinence.

Disposable single-use cleaning equipment is preferred.
Any re-useable cleaning equipment is to be dedicated to the patient’s room and cleaned and disinfected after each use. If re-useable mop heads are used they shall be bagged and sent for laundering at the completion of each use.

Physical (manual or mechanical) cleaning is the most important step in the cleaning process and sole reliance on a disinfectant without physical cleaning is not recommended.

A 2-step clean is required, which involves using a neutral detergent followed by the use of a bactericidal disinfectant e.g. a chlorine-containing solution. Alternatively, a 2-in-1 clean using a combined detergent / bactericidal disinfectant can be used.

On patient discharge:
- any unused / unopened disposable items shall be discarded
- patient bed screens (and window curtains, if fitted) shall be sent for laundering / dry cleaning
- the room can be used immediately after cleaning, once surfaces are dry.

10.7 Use of Disinfectants

As disinfectants are inactivated by organic material, any visible soiling should be removed with paper towels prior to cleaning.

Information on how to prepare and use the disinfectant and relevant material safety data sheets (MSDS) shall be available to cleaning staff.

10.8 Patient Transfers

VRE status must not compromise patient management.

Patients with VRE shall not be refused admission to any HCF or RCF.

Regarding internal transfers:
- avoid unnecessary transfers of VRE patients within the hospital
- notify receiving departments of VRE status prior to transfer
- whenever possible, place VRE patients last on procedural lists to allow time for adequate cleaning / disinfection of the environment and equipment.

Regarding external transfers:
- the transferring facility shall notify the receiving HCF or RCF prior to the transfer of the patient to ensure appropriate bed management occurs
- all relevant medical and nursing documentation accompanying the patient must clearly state details of the patient’s VRE history and include their risk assessment for VRE transmission.

10.9 Linen

Standard precautions apply.

Stockpiling supplies of linen in the patient room is not to occur and any unused linen is not to be returned to general use.

10.10 Crockery and Cutlery

Standard precautions apply.
10.11 Waste Disposal
- Standard precautions apply.

10.12 Laboratory Specimens
- Standard precautions apply.

10.13 Visitors
- Visitors are to be instructed to perform hand hygiene prior to entering, and on leaving, the patient’s room. No protective clothing is required to be worn by visitors.

10.14 Duration of Precautions
- Precautions are to continue for the length of the patient stay.

10.15 Patient Discharge
- All VRE-positive patients are to be provided with education (both verbal and written) on the risk of transmission of VRE, the importance of notifying health care providers of their status, and should be made aware of their possible life long carriage of VRE.

10.16 Care of the Deceased
- Standard precautions apply.

11. Management of VRE Positive Patients (Specific Settings)

11.1 Hospital non-inpatient settings
- These includes all departments where the patient is not admitted to the facility overnight e.g. emergency, day surgery, radiology and outpatient clinics.
- Standard precautions apply for all patients in all non-inpatient settings, including the requirements for HCWs to comply with hand hygiene policies.
- Any patients colonised or infected with VRE shall be directed to perform hand hygiene with an ABHR prior to entering the area.
- If risk factors for transmission are present (refer page 2) the patient shall be physically separated from other patients if this can be achieved without affecting the provision of care.
- On discharge, all surfaces contacted by the patient (e.g. chair, examination table, doorknobs, equipment) shall be cleaned using a 2-step clean (see section 10.6).

11.2 Haemodialysis units
- Haemodialysis patients are a known high-risk group for both colonisation and infection with VRE. An individual risk assessment shall be completed for each VRE positive haemodialysis patient to identify risk factors for transmission (refer page 2).
- Routine screening shall be performed on all haemodialysis patients as described in section 1.2.
The most recent screening result must be made available to the receiving facility when patient transfers occur between haemodialysis units.

The infection prevention and control strategies described in Section 10 are applicable in the haemodialysis setting with the adjustments as described below.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Does the Patient have Risk Factors for Transmission</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
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<tr>
<td><strong>Patient Placement</strong></td>
<td>▪ Open dialysis area</td>
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<tr>
<td></td>
<td>▪ Place clean sheet over dialysis chair</td>
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<td></td>
<td>▪ Hand basin in close proximity to space</td>
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<td></td>
<td>If multiple patients - cohort in adjoining bays and allocate to one nurse</td>
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<tr>
<td><strong>Patient Scheduling</strong></td>
<td>Consider dialysing patient on the last session for the day to optimise cleaning requirements.</td>
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<tr>
<td><strong>Hand Hygiene</strong></td>
<td>If hands are visibly soiled - wash with soap and water, otherwise use an antiseptic hand wash or ABHR for all hand hygiene.</td>
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<tr>
<td><strong>Toilet Facility (Shared Use)</strong></td>
<td>If ensuite unavailable or unable to dedicate a toilet for VRE patient:</td>
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<td>▪ instruct VRE patient to close toilet lid after use and prior to flushing to minimise environmental contamination by aerosols.</td>
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<tr>
<td></td>
<td>▪ toilet to be cleaned and disinfected prior to use by other patients.</td>
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Vancomycin Resistant Enterococci (VRE)

What are Enterococci?
- Many people carry bacteria called enterococci in their bowel and it causes no illness. Sometimes enterococci can find their way into other parts of the body and cause an infection, most often in people whose ability to fight infections has been lowered (e.g. cancer patients, renal dialysis patients). The most common sites of infection are the urinary tract and wounds.

What is VRE?
- VRE stands for Vancomycin Resistant Enterococci.
- Vancomycin is an antibiotic that is sometimes used to treat infections caused by enterococci. VRE are enterococci strains that have become resistant (no longer effective) to vancomycin, although there are other antibiotics that can be used for treatment.
- People who carry VRE are described as being ‘colonised’. They usually have no symptoms and experience no ill-effects. The VRE live harmlessly in the bowel or on the skin. Over a period of time (weeks to months), it is thought that most people will naturally get rid of VRE.
- VRE colonisation is not a problem for most patients. However, in hospitals VRE can cause infections in very sick patients. It is therefore important to prevent VRE from spreading within our hospitals.

How is VRE spread?
- VRE are usually spread from person-to-person by physical contact, either directly from the hands of another person or from medical equipment. It is not spread through coughing or sneezing.

How can the spread of VRE in hospitals be prevented?
- All hospitals have infection control policies in place to address this. Prevention depends on encouraging good hand hygiene practices amongst staff, visitors and patients. Make sure you wash your hands after visiting the toilet and before eating.
- Another way hospitals ensure VRE does not spread is by early identification of patients by the use of a computer ‘alert’ system.

What is the computer ‘alert’ system?
- If it is found that you are carrying VRE, an ‘alert’ will be placed on your name in the computer system that can be seen at all the public hospitals in WA. This alerts the staff at the time of your admission that extra precautions may be required during your stay.
- As there is no method for this information to be shared with WA private hospitals or hospitals outside WA, it is important to tell these health providers that you have acquired VRE.

What are the extra precautions?
- These are referred to as ‘contact precautions’ and are implemented to reduce the risk of staff ‘picking up’ VRE and transferring it to other patients. They include being placed in a single room and the use of gown and gloves during ‘hands-on’ care. These precautions will not interfere with your treatment or the quality of care provided to you.

Can people with VRE have visitors?
- VRE does not harm healthy people, including pregnant women, children and babies. Visitors need to wash their hands or use an alcohol-based hand rub before and after visiting. At home, continue with normal hygiene practices.

What happens when I am discharged from hospital?
- Carrying VRE will not affect other members of your family or friends, provided that you have good hygiene practices, e.g. washing hands before eating or after going to the toilet.

Where can I get further information or advice?
- You can obtain further information about VRE by talking to your general practitioner or hospital doctor and/or the hospital Infection Prevention and Control Nurse.
This information is available in alternative formats upon request from a person with a disability.