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Multi-resistant Gram-negative micro-organisms (MRGN): Infection prevention and control Clinical Guideline

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Contents

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1. Introduction

This guideline outlines measures to prevent the spread of multi-resistant Gram-negative micro-organisms (MRGN) in acute care settings including emergency, outpatient, and dialysis units, and in residential care facilities including nursing homes, hospices, hostels, psychiatric facilities, correctional health, and rehabilitation facilities. Guidance is also provided for organisations providing health care in the community (e.g. home nursing organisations, medical practices, ambulance services) or any place where people colonised or infected with MRGN may receive health care.

It is imperative to prevent the spread of antibiotic-resistant bacteria such as MRGN within the healthcare setting since infections caused by these bacteria are associated with a poorer outcome for patients, including premature mortality, and contribute to the increasing burden of antimicrobial resistance in the community.

Any patient who is identified as being infected or colonised with a Gram-negative bacillus with critical antibiotic resistance should be managed with strict infection control precautions as outlined in this guideline. Hospitals should have a management plan in place in the event of a potential outbreak of one of these bacteria.

2. Definitions

In the context of this document:

carbapenemase	*means:* an enzyme that confers resistance to all carbapenem antibiotics such as meropenem or imipenem, which are considered one of the last line antibiotic classes for treatment of infections with MRGN; carbapenemases are usually carried on plasmids.
colonisation	*means*: the presence, growth and multiplication of micro-organisms without observable signs or symptoms of infection.
CR-GNB	*refers to*: any MRGN that is reported as resistant to carbapenem and includes carbapenemase-producing Enterobacterales (CPE), Acinetobacter and Pseudomonas species, as well as other non-transferable mechanisms of carbapenem resistance.
CPE	*refers to:* transferable carbapenemase-producing members of the Enterobacterales such as *Escherichia coli*, *Klebsiella*, *Enterobacter*, *Proteus* and *Morganella* species.
CRE	*refers to:* carbapenem-resistant members of the family Enterobacterales, such as *E.coli* and *Klebsiella pneumoniae*, and includes those strains that carry transferable carbapenemase and those that have other resistance mechanisms.
EPAS	*refers to:* electronic patient administration system.
ESBL	*refers to:* extended-spectrum β-lactamase, which confers resistance to all penicillin's and cephalosporins. ESBLs are found in enteric Gram-negative bacilli belonging to the family Enterobacteriaceae.

ICIMS	*refers to:* Infection Control Information Management system.
infection	*means:* invasion of micro-organisms into host tissues with replication of the organisms accompanied by signs or symptoms of illness.
MRGN	*refers to:* any clinically important Gram-negative bacillus that is reported as multidrug-resistant or carries important plasmid-mediated resistance genes.
Oacis	*refers to:* Open architecture clinical information system.
plasmid	*means:* a small, mobile genetic element that often carries antibiotic-resistance genes.
transferable	*means:* resistance that is able to be passed between different bacterial species by means of mobile genetic elements such as plasmids.

3. Principles of the standards

Standard 3: Clinical governance and quality improvement to prevent and control healthcare-associated infections, and support antimicrobial stewardship

4. Roles and Responsibility

This guideline applies to all SA Health staff (clinical, non-clinical, contract) and volunteers working within SA Health facilities.

It is the responsibility of all clinical staff to be aware of the infection prevention and control strategies contained in this guideline and to apply the recommendations when attending to all patients.

The Chief Executive of each Local Health Network is responsible for ensuring that the implementation and monitoring of staff adherence to the recommendations within their network facilities occurs.

Infection Prevention and Control professionals are responsible for ensuring that staff are given relevant training and access to resource materials.

5. General

For the purpose of this guideline MRGN are defined as Gram-negative bacteria that are resistant to multiple antibiotics or carry important plasmid-mediated antibiotic resistance genes, in particular extended-spectrum β-lactamases (ESBL), carbapenemases, and polymixin resistance. Resistance genes that are carried on mobile genetic elements, such as plasmids, can be easily transferred between species and therefore contribute greatly to the increasing problem of antibiotic resistance.

Clinically important carbapenemase-producing MRGN have been found in Australia amongst members of the Enterobacteriaceae (such as *E. coli* and *Klebsiella pneumoniae*) and in *Acinetobacter baumannii* and *Pseudomonas aeruginosa*. Plasmid-mediated colistin resistance has not been reported in South Australia.

5.1. General principles

The prevention of infection with MRGN relies on prompt identification of carriers, appropriate patient placement and use of standard and transmission-based precautions, especially diligent adherence to hand hygiene and decontamination of shared patient equipment.

Note: At no time should a person's MRGN status interfere with the provision of appropriate, high quality care. No person in South Australia should be refused admission to any health care facility or have their health care compromised solely due to being colonised or infected with MRGN.

Reservoirs of MRGN

The lower gastrointestinal tract is the most important reservoir. MRGN are found in the faeces of colonised people and can also colonise skin surfaces. MRGN may contaminate the environment around a patient and survive there for several days; environmental contamination is increased when patients have diarrhoea. Surfaces or fomites (including medical instruments and patient equipment such as commodes, shower chairs, patient lockers, overway tables) that come into contact with staff or patients' hands may also become contaminated. Sinks, drains and soap containers are also common reservoirs for MRGN within a ward area.

Mode of transmission

The most likely modes of transmission of MRGN are:

- **direct contact** - by contaminated hands of health care personnel or colonised patients
- **indirect contact** - by contact with contaminated medical and patient care equipment or environmental surfaces.

Factors that increase the risk of transmission of MRGN

The main patient-associated conditions that increase the risk of transmission of MRGN to other patients include:

- presence of diarrhoea or faecal incontinence
- presence of an enterostomy
- discharging wounds that cannot be contained by a dressing.

5.2. Surveillance and screening

Routine hospital-wide admission screening for MRGN is not recommended; however, selective admission and/or interval screening on high-risk patient groups should be undertaken for the following patients and resistance types.

Note: All patients screened for transferable carbapenem-resistance carriage should be placed on contact precautions until the results of screening are known.

For detection of carbapenemase-producing Enterobacterales (CPE) and carbapenem-resistant *Acinetobacter* species carriage*, screening of the following patient groups is recommended:

1. direct inter-hospital transfers from any overseas or interstate hospital
2. any patient with an identified overnight stay, or who has received medical treatment in an overseas hospital in the past 12 months
3. any patient identified as a "contact" of a positive CPE or carbapenem-resistant Acinetobacter species carriage patient during the current admission, or a previous hospital admission if not previously screened. A "contact" is defined as a patient who has shared the same bed space (room or ward bay), bathroom, or toilet facilities with a known colonised or infected patient for at least 24 hours.

4. contacts who have been discharged to a residential care facility or transferred to another hospital should be screened for CPE or carbapenem-resistant Acinetobacter species carriage at that facility; the receiving facility must inform the transferring facility of the results.

Note: at the present time SA Pathology laboratory requests for 'MRGN screen' will only report on carriage of CPE and carbapenem-resistant *Acinetobacter* species. Other laboratories may also include carbapenem-resistant *Pseudomonas aeruginosa*.

Frequency of screening

- Repeat screening during an admission is recommended for patients with risk factors for MRGN carriage on transfer to a high risk unit, such as intensive care or solid organ transplant unit. This should be undertaken in accordance with local health facility policy, taking into consideration a local risk assessment.
- It is recommended that CPE contacts are screened once a week for the duration of the admission, whilst cultures remain negative. Contacts who have been discharged prior to screening should be flagged on the patient administration system and screened if re-admitted within four weeks.

For further information on screening strategies, see section 2 of the Australian Commission on Safety and Quality in Health Care Recommendations for the control of carbapenemase-producing Enterobacteriaceae (CPE).

Screening in neonatal units

Special considerations apply for neonatal patients born to mothers who are known to be colonised with CPE. Consideration could be given to screening oral/nasal/pharyngeal swabs, skin/ear swabs and gastric aspirates.

Collection of specimens

Recommended screening specimens include:

- faeces (or a rectal swab) and urine from catheterised patients, as the minimum standard. Also consider screening any unhealed wounds, tracheostomy, or enterostomy.

Request 'CPE screen' and forward to the laboratory for immediate processing.

Negative screening results are usually available within three days. Confirmation of a positive result may take longer.

Alerting of MRGN status on patient records

- All patients newly identified as colonised or infected with a MRGN must have an MRO Alert placed on their electronic or paper medical record (including EPAS, Oacis and ICIMS) including information on the resistance category, specimen site and any other relevant infection control information.
- When a decision has been made to discontinue contact precautions the alert can be retired. Ensure that reasons for discontinuation of contact precautions are documented. Future risk assessment and screening will be undertaken in accordance with section 5.2 of this document.
- Contacts of patients identified with carbapenemase-producing MRGN who have already been discharged should have a contact alert placed on the patient administration system so that they may be identified on readmission as requiring screening.

5.3. Clearance for discontinuation of contact precautions

The literature does not describe an agreed protocol for clearance of MRGN carriage; the following recommendations may change over time as more evidence accumulates. It is essential that senior infection control personnel are involved in discussions regarding clearance of MRGN status.

It is recommended that:

1. Patients infected or colonised with transmissible carbapenemase resistance (CPE) are not “cleared” or de-alerted until further evidence supports a clearance protocol.
2. Patients infected or colonised with all other types of MRGN may have their MRO alert retired and be managed with standard precautions provided the following conditions are met:
   - more than 3 months have elapsed since the last positive specimen
   - no current or recent antibiotic therapy (within the last 3 months)
   - no indwelling urinary catheter present
   - no unhealed discharging wounds
   - no enterostomy or tracheostomy present.

5.4. Notification of key personnel

When the laboratory confirms the isolation of a MRGN from a patient (infected or colonised), key personnel should be notified immediately to ensure that appropriate contact precautions are initiated promptly.

Key personnel include:

- medical practitioner responsible for the care of the patient
- infection control coordinator
- nurse in charge of the ward or unit
- bed manager / duty nurse manager
- other personnel as may be specified in the facility's MRGN procedure
- for CPE or other future nominated critical resistance, the SA Health Infection Control Service.

Note: If the notification occurs outside the normal working hours of the Infection Prevention and Control personnel a system should be in place to ensure that they are informed as soon as possible the next working day.

5.5. Transfer of patients between facilities

Patients with MRGN must not be refused admission or transfer to any health care facility. The following are recommended:

- Notify the receiving health facility before transfer of a patient with MRGN, to ensure appropriate bed management.
- Medical/nursing documents accompanying the patient must clearly state details relating to the patient's MRGN status, and be communicated verbally during the clinical handover process.
- If the transfer is being conducted by a healthcare provider, e.g. SA Ambulance Service, inform them of the patient’s MRGN status when the booking is made.
- Transport via clinic car or taxi requires standard precautions only provided all discharging wounds are covered and any incontinence issues have been addressed; otherwise, transport should be by ambulance service.
- If a receiving facility cultures a MRGN from a patient within 48 hours of transfer they must advise the transferring institution of the positive result.

5.6. Antimicrobial stewardship

It is important that procedures are in place to promote the judicious use of antibiotics, particularly broad spectrum antibiotics, in order to limit the increased development of antibiotic resistant micro-organisms. Facilities should ensure that:

- antimicrobials are used for the appropriate indications, with the correct dose and duration
- the narrowest spectrum antimicrobial that is appropriate for the clinical situation is used
- current Therapeutic Guidelines: Antibiotic, *SA Health Clinical Antimicrobial Prescribing Clinical Guideline*, or facility-specific guidelines, as appropriate, and formulary restrictions are followed.

5.7. Outbreak management

An outbreak is defined as an increase in the number of cases (colonisations or infections) above the number normally occurring in a particular health care setting over a defined period of time. In a hospital setting, this may be indicated by a cluster of cases, including two or more epidemiologically linked cases, occurring in the same bay, ward, or clinical service over a short period of time, e.g. one week.

If an outbreak is suspected, this will require the implementation of a number of possible actions to assist with the investigation, such as contact screening, environmental testing, strain typing etc. The Infection Control Coordinator should liaise with a Clinical Microbiologist/Infectious Diseases Physician and senior nursing and medical personnel of the area involved. Alternatively, the Infection Control Service of the Department for Health and Wellbeing can be contacted for assistance.

In the event of a possible outbreak of cross-infection with a micro-organism possessing a critical antibiotic resistance such as CPE or *Acinetobacter* species, the establishment of an outbreak management team that includes representative from the Communicable Disease Control Branch of Department for Health and Wellbeing will be required, especially if there is evidence of involvement of more than one health facility.

Identification of any potential carriers may require screening of patients who had contact (see definition in section 5.2) at any time after admission of the first identified positive case. It is acknowledged that in some health care settings, where routine screening of patients is not commonly undertaken, identification of the index patient may be difficult because of the potential spread of the organism before it is detected.

For further guidance on suggested actions and investigations refer to the Australian Guidelines for the Prevention and Control of Infection in Healthcare 2019, section 3.4 – Management of multi-resistant organisms and outbreak situations, and the Australian Commission for Safety and Quality in Health Care: Recommendations for the control of carbapenemase-producing Enterobacterales (CPE) – A guide for acute care health facilities.

5.8. Management of patients with MRGN in inpatient areas of acute healthcare facilities

It is recommended to adopt a risk management approach when formulating strategies to manage MRGN within a health facility with limited side-rooms.

Containment of MRGN, in particular carbapenem-resistant strains, in acute health care facilities requires rigorous infection control measures and strict compliance by hospital personnel. Special awareness and education sessions are recommended for all staff in high risk clinical units.

The organisation's alert mechanism for MRGN must be implemented. Facilities are encouraged to develop a flow chart or protocol for staff to follow, in conjunction with their laboratory services, in order to facilitate this notification process.

Patient placement

When deciding where to place a new admission with an active MRO Alert, it is recommended that the Infection Control Coordinator, in consultation with the ward manager, review admissions to the ward and the need to transfer patients, with the aim of preventing transmission of MRGN.

To decrease the risk of transmission to other patients within the wards, it is important to include the following in planning patient placement:

- Place all patients with CPE in a single room with ensuite facilities.
- For other types of MRGN, a single room with ensuite facilities or dedicated bathroom is desirable; but if these facilities are not available a shared bathroom can be used, provided it is cleaned and disinfected more frequently, i.e. at least twice per day.
- Cohorting of patients with MRGN is not generally recommended and should only be considered in certain situations in consultation with the Infection Control Coordinator.
- Where there are limited facilities for isolation, give priority to isolating those patients with conditions that may facilitate transmission, e.g. presence of diarrhoea or faecal incontinence, or patients with poor hygiene practices.

For further guidance refer to Appendix 1 - Bed management guide for patients in acute care facilities.

Standard and transmission-based precautions

All patients regardless of their infectious status will require the use of standard precautions. Further information on the application of standard precautions can be obtained from www.sahealth.sa.gov.au/infectionprevention.

Contact precautions should ideally be used for all patients identified with MRGN and especially for patients identified with critical antibiotic resistances, such as CPE. These include the following elements in addition to single room placement:

- **Gloves**
  - All staff must use non-sterile gloves when direct contact with either the patient or the patient's environment is anticipated.
  - Gloves must be removed and hand hygiene performed before leaving the patient's room/area.
- **Gowns or aprons**
  - The choice of gown or apron depends on the procedure being undertaken and the risk of exposure of the healthcare worker's arms. If an apron is used, it is important to ensure that wrists and forearms are included in the hand hygiene procedure.

Patient equipment

- Ensure that minimum amounts of equipment and supplies are taken into the room.
- Dedicate the use of non-critical items (e.g. stethoscope, sphygmomanometer etc.) to a single patient, where possible.
- Patients can use communal phones; however, ensure that the patient performs hand hygiene using alcohol-based hand rub prior to using the phone and that the phone is decontaminated using a large 70% alcohol wipe prior to returning to general use.
- Store patient charts and medical records outside of the patient's room.

Cleaning

Cleaning must be performed according to the SA Health Cleaning Standard. Key points include:

- Use a Therapeutic Goods Authority (TGA) approved hospital grade disinfectant (preferably with label claims against MRGN) or a chlorine-based product (diluted to 1,000 ppm available chlorine) for routine cleaning of the patient environment.
- Pay particular attention to all frequently touched surfaces, such as bedrails, commodes, toilet, hand basins and taps.

- Ensure that all cleaning equipment and solutions are changed before moving to the next patient area/room.
- Decontaminate all patient equipment using detergent/disinfectant solution or wipes prior to use on or by another patient.
- The room may be re-used once all steps are completed and all surfaces are dry.

Infection control signage

Place signage indicating the need for contact precautions and the use of appropriate personal protective equipment (PPE) outside of the patient room. Appropriate signage can be accessed from: https://www.safetyandquality.gov.au/our-work/healthcare-associated-infection/national-infection-control-guidelines.

Movement of patients within the hospital

A patient's MRGN status must not compromise patient management, but the following points are recommended:

- The patient may go outside their isolation room for diagnostic testing and other activities, provided any lesions/wounds are covered and exudate contained and any faecal incontinence is contained
- Request the patient not to visit other patients during their hospital admission
- Encourage the patient to perform hand hygiene before leaving their room
- Gowns and gloves do not need to be worn by accompanying staff unless direct patient care is anticipated; staff must perform hand hygiene after completing the transport task.

Visitors

Under normal circumstances, there is no requirement for visitors to wear PPE. There may be certain situations where PPE may be required e.g. when a visitor is providing direct care and intends to visit another patient in the same facility.

- Instruct all visitors to perform hand hygiene prior to leaving the room. The patient's clothing may be taken home in a plastic bag for washing using a normal wash cycle.
- Provide an information fact sheet regarding MRGN. (see Consumer education below).

Consumer education

Provide affected patients and their relatives with information that clearly explains the importance of MRGN, how to prevent transmission to others whilst in hospital, and how to manage their condition once discharged. (Refer to SA Health MRGN consumer fact sheet available at www.saheatlh.sa.gov.au/hospitalinfections).

Staff colonised or infected with MRGN

Staff who are colonised or infected with MRGN should not be discriminated against as a result of their condition. Staff who become aware of their MRGN positive status are under no legal obligation to inform their employer. All staff should be aware of their responsibilities towards patients and not put them at risk of acquiring MRGN by practising good standard precautions, including aseptic technique and hand hygiene according to the *SA Health Healthcare Associated Infection Prevention Policy Directive*.

5.9. Management of patients with MRGN in the peri-operative setting

In the peri-operative environment, several modifications to the general principles outlined above can be made because the patient is not mobile. The practices listed below are recommended for any patient with any type of multi-resistant organism.

Pre-theatre

- Ensure that all patients, regardless of infectious status, shower or bathe and put on a clean theatre gown as close as possible to the scheduled procedure time.
- If the patient is an inpatient, change the bed linen as close as possible to the scheduled procedure time.
- Clean bed rails and frequently touched surfaces of the bed with detergent/ disinfectant solution or wipes prior to transport to the operating theatre.
- Patients may wait in a "holding area" provided standard precautions are adhered to; if close physical contact (i.e. physical examination) is anticipated gloves and a long-sleeved gown are required with strict attention to hand hygiene.

Theatre environment

- Staff involved in close physical patient contact (e.g. transferring patient from bed/barouche to operating room table) must wear a long-sleeved gown and gloves over theatre clothes. These must then be discarded immediately after patient contact and hand hygiene must be performed.
- All routine theatre equipment is to remain in the operating room.
- Patient case notes must be available in the theatre. Gloves must be removed and hand hygiene performed before and after writing in the notes.
- Designate a "contact" and "non-contact" staff member to decrease the number of staff having direct contact with the patient (Refer to Appendix 2).
- Electronic equipment, e.g. anaesthetic equipment, should be decontaminated by wiping over with a large alcohol wipe or disinfected according to the manufacturer's instructions. For further information refer to the SA Health Fact sheet: Safe use of anaesthetic equipment and prevention of cross infection, available at: wwww.sahealth.gov.au/infectioncontrol.
- There are no special requirements for the management of waste, linen and instruments used in the theatre environment. These items should be managed according to standard precautions and instruments according to AS\NZS 4187:2014- *Reprocessing of reusable medical devices in health service organizations*.

Note: There is no special requirement to place the patient at the end of the operating list, since routine cleaning procedures between patients are sufficient to prevent transmission.

Post-theatre (recovery)

- Allow patients with a multi-resistant organism to recover in a designated area.
- Staff involved in close physical patient contact e.g. transferring patient from barouche to bed, must wear a long sleeved gown and gloves over theatre clothes. These must then be discarded immediately after patient contact and hand hygiene must be performed.

- When the patient is discharged from the perioperative setting clean all surfaces and patient care equipment in the patient zone with an appropriate detergent/disinfectant.
- Patient privacy curtains do not require changing unless visibly soiled.

5.10. Management of patients with MRGN in outpatient settings – outpatient clinics, emergency, radiology, dental, primary care

In these settings, strict adherence to standard precautions (i.e. hand hygiene, cleaning shared patient equipment and environmental cleaning for ALL patients will assist in minimising cross-transmission risks).

Key points are:

- All patients, regardless of infectious status, should perform hand hygiene on admission to the area.
- Patients can sit in the waiting area providing all discharging wounds are covered with a clean dressing and there are no visible signs of faecal soiling.
- All staff must perform hand hygiene before and after patient contact.
- Wear gloves and a gown or apron for close physical contact (e.g. complicated wound care or assistance with enterostomies and/or toileting).
- Clean the environment between patients as for standard precautions, i.e. clean all frequently touched surfaces with an appropriate detergent/disinfectant product.

5.11. Management of patients with MRGN in dialysis centres

MRGN colonisation must not prevent inpatient or outpatient treatment in dialysis centres.

Infection control precautions specifically designed for haemodialysis settings are more stringent than the standard precautions routinely used in hospitals and should effectively prevent patient-to-patient transmission of multidrug-resistant organisms, including MRGN.

Regular auditing of compliance with standard precautions in these settings is important.

Screening for CPE is required if the patient is admitted to an acute hospital and meets the criteria outlined in the ‘Surveillance and screening’ section on page 4.

For more detailed infection control measures refer to the SA Health MRO Guidelines for Renal Replacement Therapy, 2011. *SA Health Vancomycin Resistant Enterococci (VRE) & Methicillin-resistant Staphylococcus aureus (MRSA) Screening & Management in the Adult Renal Patient Population Clinical Guidelines* (2014). Available at: www.sahealth.sa.gov.au/infectioncontrol.

5.12. Management of patients with MRGN in community health care

Community health care settings refer to all healthcare provided in a person’s home. In this setting, strict adherence to standard precautions, i.e. hand hygiene and cleaning shared patient equipment for all patients, regardless of their multi-resistant organism status, will assist in minimising cross-transmission risks.

Key points are:

- Only take essential items required for the patient into the home.
- Decontaminate hands with alcohol-based hand rub or washed with soap and water as per the *SA Health Hand Hygiene Policy Directive* and *Clinical Guideline* (before and after patient contact; before and after a procedure and upon leaving the home or environment).
- Wear PPE for close physical contact (close physical contact can be described as direct skin to skin contact that occurs when giving assistance with showering, dressing, complex wound dressings, etc.)
- Clean all re-usable equipment prior to use on or by another patient as per standard precautions:
  - If the item is to be used immediately by another patient decontaminate using a detergent/disinfectant solution or wipe.

- If the item is to be returned to a central facility for cleaning it may be placed in a plastic bag for transport.
- Larger items such as wheelchairs, commodes etc. should always be transported to a central cleaning department for thorough cleaning between patient uses. If visibly soiled, these may be spot cleaned with a detergent/disinfectant solution or wipe prior to placing in the vehicle.

> Any waste generated in the care of the patient (excluding sharps) may be discarded in the household waste.

5.13. Management of patients with MRGN in ambulance services and aeromedical transport services

In this setting, strict adherence to standard precautions, i.e. hand hygiene and cleaning shared patient equipment for all patients, will assist in minimising cross-transmission risks, regardless of multi-resistant organism status.

The following procedures must be adhered to by all ambulance staff:

> Perform hand hygiene before and after patient contact.

> Wear gloves and a gown or apron when close physical contact is required, e.g. transferring the patient from bed/barouche, but does not include taking observations.

> Perform hand hygiene after removing PPE and on exiting the ambulance or aeroplane.

> Thoroughly clean frequently touched surfaces in the ambulance and aircraft with an appropriate detergent/disinfectant solution or wipes between each patient transport.

5.14. Management of residents with MRGN in residential care facilities

Note: A person must not be refused admission to any residential care facility on the basis of MRGN colonisation or infection.

General considerations

The term residential care facility (RCF), as used in this document, applies to a diverse group of residential settings ranging from institutions for the developmentally disabled, residential mental health facilities and long-term rehabilitation settings to nursing homes for the elderly. RCFs differ from other healthcare settings in that clients reside together in one setting; for most residents it is their home. Since many residents interact freely with each other, controlling transmission of infection is particularly challenging. The psychosocial risks associated with isolation or restriction of residents to their room means that the routine transmission-based precautions applied in hospital settings are not necessarily appropriate in this setting and may require modification.

Residents of RCFs may require frequent hospitalisation, in which case they may transfer pathogens between RCFs and healthcare facilities in which they receive care. There have been several reports of ongoing transmission of MRGN in residential care facilities in the literature.

Risk factors that increase risk of transmission of MRGN

These include but are not limited to the presence of:

> diarrhoea or faecal incontinence

> enterostomies

> discharging wounds that cannot be contained by a dressing

> poor personal hygiene

> impaired cognition that leads to behaviours that increase the risk of transmission.

Screening

Routine admission and ongoing screening for MRGN is not recommended in residential care. There may be exceptions when screening is appropriate for an individual resident's management or in the investigation of a facility outbreak. This should occur as part of the facility infection prevention and control program and support should be sought from a specialist infection control professional, infectious disease physician or microbiologist, especially if the MRGN is carbapenem-resistant.

Principles of resident management

Strict adherence to standard precautions, i.e. hand hygiene, cleaning shared patient equipment and environmental cleaning, for **ALL** residents will assist in minimising cross-transmission risks.

Resident placement

Single rooms are recommended when residents with MRGN (colonisation or infection) have conditions that facilitate transmission e.g. faecal incontinence or draining wounds unable to be contained.

If single rooms are not available, residents with MRGN can be placed in a shared room with residents who are at low risk of acquisition (i.e. no unhealed wounds, not on antibiotic therapy, no indwelling invasive devices, not immunosuppressed).

For further information, refer to Appendix 3 - Bed management guide for long term facilities.

Standard precautions

Standard precautions should be applied to all residents as this is the basic infection control strategy required for care. Particular attention should be paid to hand hygiene and where practicable residents should be requested/assisted to perform hand hygiene prior to communal activities. There are no special requirements for general or clinical waste, linen handling or catering.

In rehabilitation settings or facilities, providing therapy then **ALL** residents/patients should perform hand hygiene before entering a gym or therapy room. High touch surfaces on all equipment such as hand rails, should be wiped over with a detergent/disinfectant wipe between resident/[patient use.

For further information, refer to SA Health website – Standard precautions.

Contact precautions

Contact precautions should be considered for residents that present a risk of transmission of MRGN to others as outlined on page 4 or if they have an active MRGN infection at any site. The following key points should be followed:

- All staff should put on non-sterile gloves and an impervious/fluid resistant single use gown or apron when close physical contact is required or anticipated, i.e. assistance with activities of daily living, wound care, etc.
- Gowns or aprons should not be worn outside of the room unless disposing of clinical waste, in which case they must be removed immediately after disposal of the waste and care must be taken not to contaminate the environment during the disposal process.
- Hand hygiene must be performed before and after any close contact resident care.

Routine cleaning

When MRGN infection or colonisation is known to be present, routine cleaning should be intensified. This includes the addition of a TGA approved hospital grade disinfectant (preferably with label claims against MRGN) OR a chlorine-based product (diluted to 1,000 ppm) paying particular attention to all frequently touched surfaces such as bedrails, door handles, commodes, bathroom, toilet, hand basins and taps. Further information can be found in the *SA Health Cleaning Standard*.

Detergent solution may be used on all other surfaces in the room, including the floor.

Antibiotic control

Multi-resistant organisms can pose a significant risk for residents in RCFs and this resistance has been strongly associated with antibiotic use. A common problem leading to overuse of antibiotics is the failure to distinguish between infection and colonisation, for example, prescribing antibiotics for a positive swab culture from a pressure ulcer or urine culture without signs and symptoms of infection. Antibiotics may also be prescribed over the telephone without the medical officer physically reviewing the resident, which will compound issues with inappropriate antibiotic use.

Policies and procedures should be in place to promote judicious antibiotic use, particularly of broad spectrum antibiotics, in order to limit the increase and spread of antibiotic resistant micro-organisms such as MRGN within RCFs. Refer to the *SA Health Antimicrobial Stewardship Policy Directive* for further information.

6. National Safety and Quality Health Service Standards

National Standard 1 Clinical Governance	National Standard 2 Partnering with Consumers	National Standard 3 Preventing & Controlling Healthcare-Associated Infection	National Standard 4 Medication Safety	National Standard 5 Comprehensive Care	National Standard 6 Communicating for Safety	National Standard 7 Blood Management	National Standard 8 Recognising and Responding to Acute Deterioration
☒	☐	☒	☐	☐	☐	☐	☐

7. Observations

Implementation of this guideline is designed to promote consistency of practice and minimise the occurrence of healthcare acquired infection caused by MRGN and consequently reduce the potential for patient harm. Local Health Networks are responsible for the implementation of the recommendations contained within this document.

The effectiveness of this guideline will be monitored through:

- regular review of MRGN infection rates by all SA Health public hospitals. Data are reported monthly as part of the Safety and Quality hospital performance indicator set.
- annual in-depth epidemiological analysis of healthcare associated infection rates by the SA Health Infection Control Service as part of the statewide healthcare infection surveillance system.

8. Appendices:

- Appendix 1: Bed management guide for patients in acute care facilities
- Appendix 2: Contact and non-contact zones for control of MRGNs in the peri-operative setting
- Appendix 3: Bed management guide for residents in long term care facilities.

9. References

9.1. SA Health policies and guidelines:

- Antimicrobial Stewardship Policy Directive
- Cleaning Standard for Healthcare Facilities
- Hand Hygiene Clinical Guideline
- Hand Hygiene Policy Directive
- Healthcare Associated Infection Prevention Policy Directive
- Healthcare Associated Infection Surveillance Policy Directive
- Management of the Healthcare Environment to Minimise the Risk of Transmission of Infection Policy Directive

9.2. Resources:

- Australian Commission on Safety and Quality in Health Care. Recommendations for the control of carbapenemase-producing Enterobacteriaceae (CPE). May 2017. ACSQHC: Sydney. Available from: https://www.safetyandquality.gov.au/our-work/healthcare-associated-infection/cpe-guide
- Australian guidelines for the prevention and control of infection in health care facilities, 2019, NH&MRC. Available from: https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019
- Centers for Disease Control. Facility Guidance for Control of Carbapenem-resistant Enterobacteriaceae (CRE). November 2015 Update – CRE Toolkit. Available from: https://www.cdc.gov/hai/organisms/cre/cre-toolkit/index.html
- SA Health Bed Management Toolkit. Available from: www.sahealth.sa.gov.au/infectionprevention
- SA Health CPE management quick reference guides. Available from https://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/clinical+resources/clinical+topics/healthcare+associated+infections/multidrug-resistant+organisms+mro/carbapenemase-producing+enterobacterales+%28cpe%29+infection+control
- SA Health Consumer fact sheet on MRGN. Available from: www.sahealth.sa.gov.au/hospitalinfections

10. Document Ownership & History

Document developed by: Infection Control Service, Communicable Disease Control Branch, Health Regulation and Protection
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Policy history: Is this a new policy (V1)? **N**
Does this policy amend or update an existing policy? **Y**
If so, which version? v1.1
Does this policy replace another policy with a different title? **N**
If so, which policy (title)?

Approval Date	Version	Who approved New/Revised Version	Reason for Change
11/11/19	v1.2	Director, Communicable Disease Control Branch	Placed into new template, update references
01/08/17	v1.1	SA Health Policy Committee	Placed into new template, restructured and minor amendments to content.
21/06/16	v1.0	SA Health Safety & Quality Strategic Governance Committee	Original version

Appendix 1: Bed management guide for patients in acute care facilities

Ideally known MRGN carriers should be placed in a single room with ensuite facilities. If this is not possible the following questions need to be asked to identify any risk factors for transmission.

Patient has an active alert for MRGN carriage

Carbapenem-resistant Gram-negative bacilli (CR-GNB)

- *Enterobacterales* (e.g. *E.coli, Klebsiella pneumoniae)*
- *Acinetobacter sp.*
- *Pseudomonas aeruginosa*

All patients must be isolated in a single room with ensuite bathroom

ESBL or AmpC producing Enterobacterales, e.g.

- *E.coli*
- *Klebsiella pneumoniae*
- *Enterobacter species*
- *Proteus species*

Multi-resistant strains of:

- *Pseudomonas aeruginosa*

Do they have <u>any</u> of the following:

- Diarrhoea or uncontained faecal incontinence
- Discharging wound/s that cannot be contained by a dressing
- Presence of an enterostomy or urinary catheter
- Unable to comply with, or manage personal hygiene

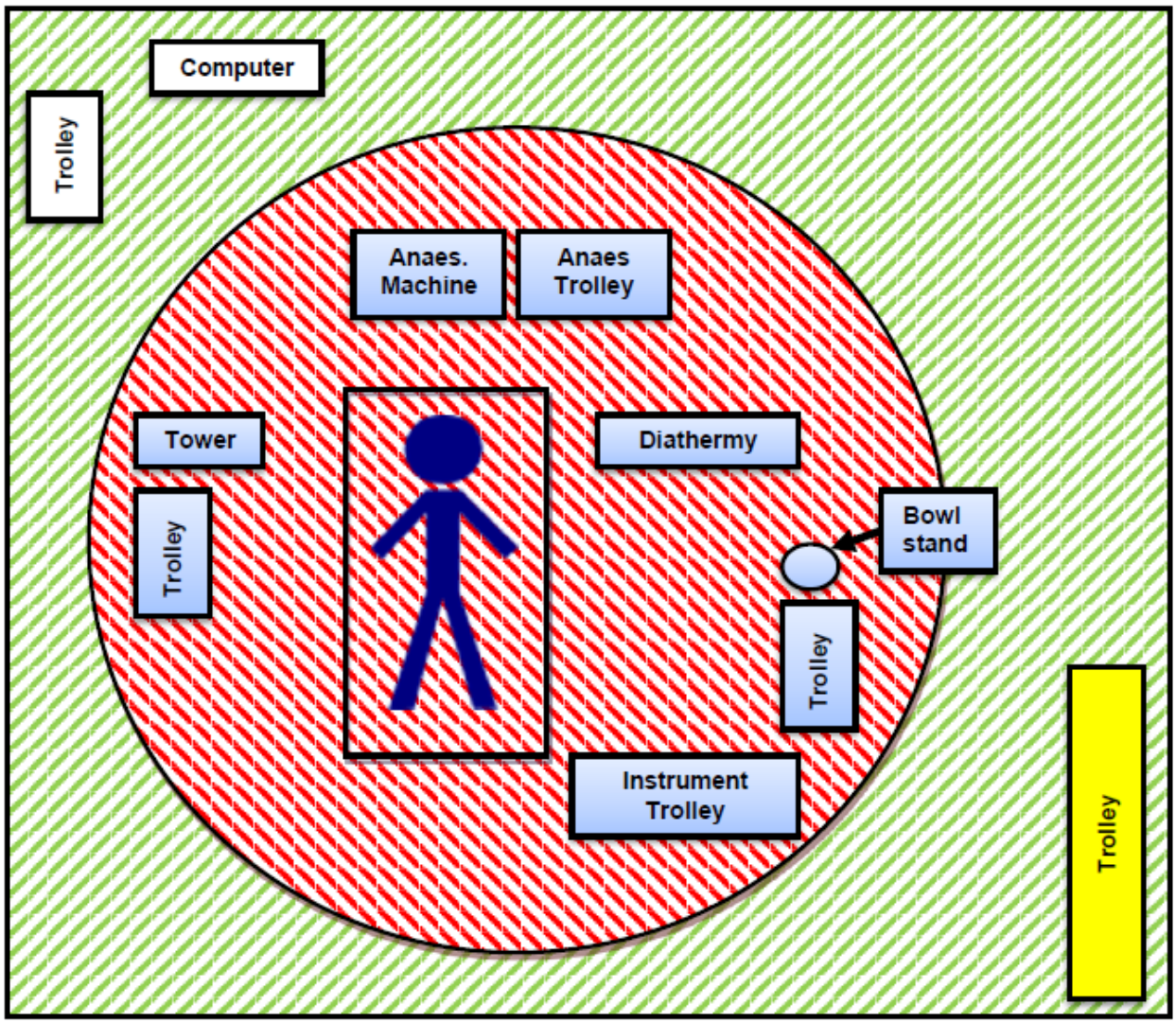
YES → **Single room with ensuite bathroom**

NO → Can be placed in a shared room on Standard Precautions only **with patients at low risk for infections** i.e. do not have:

- No unhealed wounds present
- No indwelling devices e.g. PEG, indwelling urinary catheter
- Not on immune suppressive therapy

Do not cohort with another patient/resident carrying a different MRO e.g. MRSA, VRE

Appendix 2: Contact and non-contact zones for control of MROs in the peri-operative setting



Appendix 3: Bed management guide for residents in long term care facilities e.g. aged care, rehabilitation, mental health

Ideally known MRGN carriers should be placed in a single room with ensuite facilities. If this is not possible the following questions need to be asked to identify any risk factors for transmission.

Resident/patient identified as having a MRGN

Identified with CR-GNB

- Carbapenem-resistant Gram-negative bacilli

Discuss management with an ID physician or Infection Control Service on 7425 7161

Identified other MRGN (e.g.):

- ESBL or AmpC producing Gram-negative bacilli
- Multi-resistant strains of *Pseudomonas aeruginosa* and *Acinetobacter sp.*

Do they have <u>any</u> of the following:

- Diarrhoea or uncontained faecal incontinence
- Discharging wound/s that cannot be contained by a dressing
- Presence of an enterostomy or urinary catheter
- Unable to comply with, or manage personal hygiene

YES → **Single room with ensuite bathroom**

NO

Can be placed in a shared room on Standard Precautions only **with patients at low risk for infections** i.e.:

- No unhealed wounds present
- No indwelling devices e.g. PEG, indwelling urinary catheter
- Not on immune suppressive therapy

Do not cohort with another patient/resident carrying a different MRO e.g. MRSA, VRE