<table>
<thead>
<tr>
<th>NAME OF DOCUMENT</th>
<th>Carbapenem resistant Enterobacteriaceae (CRE) and Carbapenem-resistant Pseudomonas aeruginosa (CR-PA) identification and management</th>
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</thead>
<tbody>
<tr>
<td>TYPE OF DOCUMENT</td>
<td>Procedure</td>
</tr>
<tr>
<td>DOCUMENT NUMBER</td>
<td>SESLHDPR/396</td>
</tr>
<tr>
<td>DATE OF PUBLICATION</td>
<td>March 2015</td>
</tr>
<tr>
<td>RISK RATING</td>
<td>High</td>
</tr>
<tr>
<td>LEVEL OF EVIDENCE</td>
<td>NHMRC grade A - Body of evidence can be trusted to guide practice</td>
</tr>
<tr>
<td>REVIEW DATE</td>
<td>March 2017</td>
</tr>
<tr>
<td>FORMER REFERENCE(S)</td>
<td>N/A</td>
</tr>
<tr>
<td>EXECUTIVE SPONSOR or EXECUTIVE CLINICAL SPONSOR</td>
<td>Director Clinical Governance</td>
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<tr>
<td>AUTHOR</td>
<td>SESLHD Infection Prevention and Control Consultants Forum</td>
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<tr>
<td>POSITION RESPONSIBLE FOR THE DOCUMENT</td>
<td>Infection Control Manual Working Party SESLHD Infection <a href="mailto:ControlDL@sesiahs.health.nsw.gov.au">ControlDL@sesiahs.health.nsw.gov.au</a></td>
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<tr>
<td>KEY TERMS</td>
<td>Multi-resistant organisms (MROs), transmission, Carbapenem resistant Enterobacteriaceae, CRE, cleaning, outbreak, Carbapenem-resistant Pseudomonas aeruginosa (CR-PA)</td>
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<td>SUMMARY</td>
<td>To provide guidance to clinicians in relation to the identification and management of CREs and CR-Pas, highlighting the need for recognition of these organisms as clinically and epidemiologically important, identifying colonised and infected patients and implementing facility-based interventions designed to prevent transmission of these organisms.</td>
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1. POLICY STATEMENT
The aims of this policy are:
- Recognising these organisms as clinically and epidemiologically important;
- Understanding the prevalence within healthcare facilities;
- Identifying colonised and infected patients when present within the healthcare facility; and
- Implementing facility-based interventions designed to stop the transmission of these organisms

2. BACKGROUND
Gram-negative bacteria have now emerged that are resistant to most types of antibiotics, including a key “last resort” class of antibiotic, the carbapenems. These organisms are referred to as carbapenem-resistant Enterobacteriaceae (CRE) (common genera like *E coli, Klebsiella pneumoniae*) and carbapenem-resistant *Pseudomonas* (CR-PA). Multi-resistant Gram-negative bacteria, such as CRE and CR-PA, place SESLHD patients at greater risk of potentially untreatable infection and increased mortality.

CRE/CR-PA infections are associated with high morbidity and mortality and are spreading rapidly worldwide. They contribute to death in up to 40% of patients who become infected. CRE infections occur in people receiving significant medical care in hospitals, long-term acute care facilities, or nursing homes.

Scrupulous hand hygiene, standard infection control precautions, patient education, antimicrobial stewardship and environmental cleaning are all key strategies in the prevention of acquisition and transmission of CRE/CR-PA.

3. RESPONSIBILITIES

3.1 Directors of Operations are to:
   a) Provide resources to enable compliance with this Policy; and
   b) Ensure compliance with this Policy is monitored and evaluated.

3.2 Directors of Clinical Operations and Directors of Nursing and Midwifery are to:
   a) Delegate the day-to-day responsibility of establishing and monitoring the implementation of this policy to the relevant clinical teams
   b) Make appropriate education and training available to all clinical staff

3.3 SEALS Laboratory is to:
   a) Delegate the day-to-day responsibility of establishing and monitoring the implementation of this policy to the relevant laboratory staff
   b) Make appropriate education and training available to all clinical staff
   c) Communicate facility CRE/CR-PA prevalence to facility AMS Committee and SESLHD Patient Safety and Quality Committee
   d) Notify Infection Prevention and Control Staff of CRE and CR-PA isolates immediately

3.4 Environmental Cleaning Managers are to:
   a) Ensure staff are trained in daily and terminal cleaning of CRE/CR-PA patients rooms
   b) Comply with this policy to reduce the risk of the patient acquiring a healthcare associated infection
3.5 Infection Prevention and Control Staff are to:
   a) Ensure correct alerts are placed in eMR (Powerchart) and iPM
   b) Support education programs

4. DEFINITIONS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>Carbapenem-resistant Enterobacteriaceae</td>
<td>CRE, which stands for carbapenem-resistant Enterobacteriaceae, are a family of Gram-negative bacteria that are difficult to treat because they have high levels of resistance to multiple classes of antibiotics, including the carbapenems.</td>
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<tr>
<td>(CRE)</td>
<td><em>Klebsiella</em> species and <em>Escherichia coli</em> (<em>E. coli</em>) are examples of Enterobacteriaceae, a normal part of the human gut bacteria that can become carbapenem-resistant.</td>
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<tr>
<td>Carbapenem-resistant Pseudomonas aeruginosa</td>
<td>Carbapenem resistant Pseudomonas aeruginosa with resistance in 3 or more major antibiotic classes (CR-PA)</td>
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5. PROCEDURE

5.1 Patients at risk

Studies have demonstrated that CRE/CR-PA are more likely to affect patients who have:
- a poor functional status
- a prolonged hospital stay
- a hospital stay within the previous 12 months
- multiple exposures to different antibiotic agents
- diabetes mellitus
- mechanical ventilation
- a higher severity of illness
- admission to the intensive care unit
- an indwelling medical device, such as a central venous catheter, urinary catheter, biliary catheter or wound drainage
- an organ or stem-cell transplant.

Introduction of CRE/CR-PA into healthcare settings in Australia has occurred predominantly in two scenarios:
- when patients have been transferred directly between healthcare facilities, as inter-hospital transfers; or
- when patients have received medical care abroad in areas with high rates of CRE/CR-PA, and have subsequently been admitted to facilities where CRE/CR-PA are absent or uncommon.

Rapid spread can occur without early identification, and then aggressive infection prevention and control strategies are required to prevent the organism becoming endemic in an institution.
5.2 Identification and Notification of Patients

- SEALS to immediately notify treating medical officer or the medical officer in charge afterhours (by phone) of any patients with Carbapenem resistant Enterobacteriaceae or Carbapenem resistant Pseudomonas with resistance in 3 major classes of antibiotics.
- SEALS to notify facility Infection Prevention and Control staff and Infectious Diseases Physician (by email Alert). Hospitals to negotiate with SEALS Microbiologist regarding any further notification. SEALS to provide phenotypic confirmation and molecular screening.
- Infection Prevention and Control CNCs to maintain a record of affected patients
- Infection Prevention and Control to add an Infection Control Alert into eMR (Powerchart) and iPM

5.3 Transmission

- Transmission can occur from body fluids such as faeces, urine, skin, wound drainage and secretions such as sputum. Organisms can be transmitted directly from person to person (contact) and indirectly from fomites - objects or materials which are likely to carry the microorganism, such as shared patient care equipment, urine measure jugs and patient furniture

5.4 Hospital Management of Colonised / Infected Patients

- The patient must be isolated in a single room with an ensuite; no cohorting allowed
- Patient to have limited movement outside their room and if required patient should perform hand hygiene on leaving and returning to their room
- Strict standard and contact precautions for all staff (which requires daily monitoring by the in-charge nurse)
- Use of single-use or single patient use equipment if possible. If equipment is shared, it must be cleaned before and after use on the patient
- Strict management of the emptying of urinary catheter bags with cleaned measuring jugs
- Visitors must perform hand hygiene on entering/leaving room. Visitors must not sit on beds or use patient toilets, and they must not visit any other patients in hospital afterwards.
- Visitors who are immune-compromised should receive advice in regards to visiting.
- Patients with documented CRE/CR-PA carriage should be isolated during every subsequent admission over the following 12 months to allow for rescreening to determine CRE/CR-PA status.
- Ensure patient's linen and towels are changed daily
- If bed bound, patient to be provided with hand hygiene products for use after toileting and prior to eating

5.5 Antimicrobial Stewardship (AMS)

- Treating team must discuss antibiotic prescribing for the affected patient with Infectious Diseases Physician/Microbiologist.
- Maintain and monitor appropriate antibiotic prescribing within the facility as part of AMS
5.6 Cleaning

- Daily Room Cleaning with neutral detergent and routine bathroom cleaning product
- Discharge clean (terminal clean) is to be undertaken/performed with both a neutral detergent to clean followed by a disinfectant surface treatment
- All curtains to be changed
- Shared patient care equipment to be cleaned with both a neutral detergent and a disinfectant

5.7 Communication

- Patient must be informed and educated about MRO status by treating medical team in consultation with Infection Prevention and Control or Infectious Diseases to discuss the diagnosis and management. This information should be repeated prior to discharge. The patient and/or family will be provided with the patient information brochure (See appendix 1).
- MRO status must be confidentially included in clinical handover, transfer to another facility, receiving department and transport officers.

5.8 Contact Tracing

- Screening should be performed in patients who have been in contact (e.g. were in same bed area for more than 6 hours) during the current admission with a patient carrying or infected with CRE/CR-PA.
- Screening specimens should include rectal swab or stool, wound swabs, ET aspirate (if relevant), urine if the patient is catheterised.
- Contacts should be isolated/cohorted until 2 sets of negative cultures at least 48 hours apart have returned.
- Patients do not need to remain in hospital for the results of screening but a mechanism for contacting them for results is required.

5.9 Collection of Specimens

All laboratory request forms are to be marked “For CRE or CR-PA Screening.” The procedure for collecting a rectal swab is as follows:

- dip a sterile cotton swab in sterile water or normal saline
- insert swab 1cm into rectum and gently rotate 360 degrees
- place swab into transport container and process as per normal.
- For patients with enterostomies, a stomal specimen is required.
- If concurrent VRE screening is required, a separate rectal swab should be used.
- If a wound or drain is present, a single wound or drain specimen is required.
- If an indwelling or supra-pubic catheter is present or the patient is having intermittent urinary catheterisations, a urine specimen is required.

If an endotracheal tube (ETT) is present, an ETT aspirate is required.
5.10 **Cluster/ Outbreak of Cases**

In the event a facility has a cluster of 2 or more cases contact Infection Prevention and Control staff. Cluster management procedure to follow agreed Facility IC, ID and Microbiology cluster management plan. All clusters/outbreaks must be reported to the facility Infection Prevention and Control Committee.

6. **DOCUMENTATION**

- Patient’s healthcare record
  - Progress Notes
  - Patient Care Plan
- Electronic Medical Record
  - PowerChart alerts

7. **AUDIT**

Not required

8. **REFERENCES**

**Recommendations for the control of Multi-drug resistant Gram-negatives: carbapenem resistant Enterobacteriaceae, Australian Commission on Safety and Quality in Health Care, November 2013**


**2012 CRE Toolkit - Guidance for Control of Carbapenem-resistant Enterobacteriaceae (CRE)**

**Infection Prevention and Control of Carbapenem-resistant Enterobacteriaceae (CRE) in Western Australian Healthcare Facilities – October 2012**

9. **REVISION AND APPROVAL HISTORY**

<table>
<thead>
<tr>
<th>Date</th>
<th>Revision No.</th>
<th>Author and Approval</th>
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<tbody>
<tr>
<td>November 2014</td>
<td>0</td>
<td>Draft procedure developed</td>
</tr>
<tr>
<td>March 2015</td>
<td>1</td>
<td>Endorsed by SESLHD Clinical and Quality Council</td>
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</table>
Information for patients and their visitors

Carbapenem Resistant Pseudomonas aeruginosa (CR-PA)

What is CR-PA?

**Pseudomonads** are a family of bacteria that normally live in the environment especially in water and soil. One of these organisms, *Pseudomonas aeruginosa*, may cause serious infections in patients in hospitals, especially if their immune system is weakened.

**Carbapenems** are an important group of antibiotics that usually work against these bacteria. Some bacteria have become harder to treat because these antibiotics no longer work – the bacteria have become resistant to the antibiotics. These bacteria are called **Carbapenem Resistant Pseudomonas** (CR-P).

How do you get CR-PA?

In Australia, CR-PA infections are rare and at present the cause is unclear. These infections are usually seen in people who are seriously ill in hospital. Healthy people do not usually get CR-PA infections. However, it is important to know some people may carry CR-PA in their bowel or in a wound without making them sick. This is called **colonisation** and doesn’t usually require any treatment.

People who carry CR-PA are at risk of getting a CR-PA infection if they have an operation, are admitted to an intensive care unit, have catheters and intravenous drips or are on antibiotics for long periods of time. Antibiotics other than carbapenems are available to treat CR-PA if you have an infection and it is making you sick.

What does it mean to have CR-PA?

In some people, CR-PA can become a serious problem and may cause infections such as pneumonia, abscesses, bloodstream infection, or other types of serious infections.

What happens if you have CR-PA?

If your doctor considers that you may be colonised or be infected with CR-PA, they will do some simple tests. This might involve taking a swab, blood or urine sample. The results of these tests will help your doctor work out whether treatment is required and if so the best form of treatment for you. Your doctor will work closely with the laboratory for your options. In some cases, especially for carriers, this will mean no antibiotic, to allow normal bacteria to grow back.

To prevent the spread of CR-PA to other people when you are at home, it’s important that you follow these precautions:

- Wash your hands with soap and water and dry them thoroughly. For example, after going to the toilet, before preparing and eating food and after touching animals.
- Use your own towels and face cloths. Do not share these items with other people.
- Avoid sharing grooming items such as nail scissors, tweezers, razors and toothbrushes.
- Cover any skin wounds whenever possible.
- Make sure you follow instructions and advice provided by your doctor or healthcare provider on how to care for wounds, or manage medical devices you may have when you are at home (eg urine catheter, PICC or central line).
However:
- All your clothing and towels can be washed the way you normally do.
- All eating utensils and dishes can be washed the way you normally do.

If you are in a hospital, in addition to usual practice such as hand washing or using alcohol based hand rub, the staff will use special practices to reduce the risk of spreading CR-PA to other patients. These may include:
  - Caring for you in a single room.
  - Wearing a gown and gloves while they are caring for you.

You can help prevent spreading CR-PA to other patients by:
  - Regularly washing your hands with soap and water or using an alcohol based hand rub.
  - Staying in your room, unless you need to be transferred for special tests or treatment.
  - Washing or cleaning your hands when you leave the room.

If you have CR-PA, can you have visitors?
If you have CR-PA, you can have visitors, but it is important to know that CR-PA can affect people who have some long-term health problems. Talk with your doctor or nurse if someone is visiting you and has a long-term health problem or having treatment for cancer.
It is important that your visitors wash their hands or use an alcohol based hand rub before and after visiting you. Visitors may also be asked to wear gloves or gowns. They should not visit other patients after visiting you.

Where can I get more information?
If you have any questions, the hospital’s infection control professional or the doctor or nurse looking after you or your family can help.

Acknowledgements
Australian Commission on Safety and Quality in Health Care; www.safetyandquality.gov.au