

## Policy Applies to:

All staff employed by Mercy Hospital. Credentialed Specialists, Allied Health Professionals, students, patients and visitors will be supported to meet policy requirements.

## Related Standards:

- Infection and Prevention and Control Standards NZS 8134.3:2008
- EQuIP Standard Criterion 1.5.2

## Definitions:

**PPE**- personal protective equipment. Isolation PPE can consist of long sleeved moisture resistant gown, gloves, face shield, eye protection, and masks.

*Enterobacteriaceae* - a large and diverse family of gram-negative bacteria and although they generally exist as commensal organisms in the human gastrointestinal tract, they can be responsible for a variety of infections, including; urinary tract infections, wound infections, gastroenteritis, meningitis, septicaemia, and pneumonia. Amongst the gram-negative bacteria, the *Enterobacteriaceae* are the most frequent cause of both community-acquired and health care-acquired infections.

**Multidrug Resistant Organisms (MDRO)** can be defined in two ways - organisms that are resistant to:

- Several antimicrobial classes to which they would normally be susceptible, or
- All but one or two antimicrobial classes, regardless of the mechanism of resistance (and often susceptible to only one or two commercially available antibiotics).

Such organisms include:

**MRSA** - Methicillin resistant *Staphylococcus aureus*

**ESBL** - Extended-spectrum beta-lactamase, producing enterobacteriaceae

**VRE** - Vancomycin-resistant enterococci

**CRE** - Carbapenem-resistant enterobacteriaceae, (Including CPE Carbapenemase-producing enterobacteriaceae or CRO Carbapenem-resistant organism).

**Other Gram negative MDRO**; all of which are covered in these guidelines.

## Rationale:

### General Background

Controlling MDRO's is important because they:

- Are resistant to usual antimicrobial therapy
- Increase patient morbidity and mortality

- Increase the length of hospital stay and cost of treatment
- Have the potential to spread
- Act as a reservoir of resistant genes for the transmission to other organisms

Successful control of MDRO is based on a combination of interventions:

- Screening of patients at high risk of MDRO carriage
- Rigorous adherence to hand hygiene
- Appropriate use of personal protective equipment (PPE)
- Implementation of transmission-based precautions
- Cleaning and disinfection of shared patient equipment

### **Modes of transmission:**

Contact transmission is the primary mode of spread for MDRO:

- Transient carriage on the hands of health care workers is a significant risk for transmission.
- Surfaces and equipment can also become reservoirs and contribute to spread within the healthcare environment.
- Droplet transmission may also be implicated in the spread of MDRO when the patient has a respiratory tract infection where the MDRO is causative organism.

### **Objectives:**

To prevent and control the spread of Multidrug-resistant Organisms.

To minimise the risk of cross infection to other patients, staff and visitors.

### **Implementation:**

#### **Screening patients for MDRO**

Screening patients for MDRO is an important measure in the control of spread of these resistant organisms.

Patients are screened on first contact with the Credentialed Specialist for MRSA, VRE, CRE and ESBL according to the MDRO flow chart, screening for MDRO, see

**Appendix 1.**

This chart is used in conjunction with any communication stating which healthcare providers, or countries that are considered “high risk”. Communication will be circulated to credentialed specialists, clinical and booking staff of Mercy Hospital by the Infection Prevention and Control Nurse (IPC Nurse) via email. The MDRO high risk communication will be distributed when there are changes to the high risk list.

Screening will be initiated by the Credentialed Specialist's rooms to ensure that patients are screened appropriately, in a timely manner, and to ensure that the patient does not receive inappropriate antibiotic prophylaxis/treatment. **Appendix 4** maybe provided to patients from Specialist rooms and those issuing screening requests to detail how this is performed.

Screening will be undertaken prior to the patient entering the hospital for surgery, and an allowance of up to 7 days is required for the lab processing of collected specimens. Screening results are valid for 6 months, if no additional travel or hospital admissions to high risk healthcare providers have occurred during the 6 month period.

**If the patient is admitted to hospital in less than 7 days.**

The IPC Nurse must be informed and the patient must have a single room in the overnight ward. If a single room is not available, a multi bed room maybe use with curtains pulled. Screening must be undertaken as soon as possible. If the patient is unable to have a single room, it may be appropriate to delay surgery until results are known. The patient is cared in standard precautions until results are known. Patient MDRO status should be ascertained prior to admission, habitual non screening of patients in a timely manner will be monitored by the IPC Nurse.

**Communication of MDRO status**

Patients found to meet the criteria will be communicated to Mercy through either the bookings form, notifying the bookings clerk, or the IPC Nurse. An 'ALERT' will be entered on the TrakCare System by the Bookings staff or following notification to them of a pending MDRO screening. MDRO alerts may only be removed by the Bookings staff or Charge Nurse Manager or Shift Leader. A note on the MDRO alert will state which MDRO has been screened for and what is pending.

MDRO pending patients must be booked into a single room in the overnight ward. Pending MDRO will be stamped on the draft Theatre List, and reviewed by the Theatre Coordinator and the Day Surgery Shift Leader one operating day prior to surgery. If the status is still pending on the day of surgery, the Theatre Coordinator must be alerted. It is the responsibility of the Theatre Coordinator to distribute this information to the relevant staff, including Theatre Suite Assistant staff.

In the event of positive MDRO status known in advance of surgery, the IPC Nurse will be notified.

Positive MDRO status will be communicated by Preadmissions Nursing staff to the, IPC Nurse, , Theatre Coordinator, the relevant ward/area Clinical Nurse Manager or

Shift Leader. This will be done by email. It is the responsibility of those receiving the information to disseminate the information to only to those that require it. If patient requires isolation, notification needs to be made to the Housekeeping Coordinator who will disseminate as required.

Positive MDRO results will be placed on the patients file and notification will be placed on the NHI Alert by the Director of Clinical Services or Clinical Nurse Manager and the TrakCare Alert will stay active on the patients file for further admissions to hospital.

### **Care of the MDRO Positive Patient - General Points**

#### **Placement and contact isolation of the MDRO positive patient**

Patient room allocation and isolation management is detailed in Appendix 2.

Patients with confirmed positive MDRO are cared for in a single room, with access to their own bathroom with toilet. If a dedicated toilet for the isolation patient is not possible, a commode at the bedside must be used. Signage at the doorway of the room instructing PPE and isolation type must be displayed.

In all MRSA, VRE, CRE positive cases, contact precautions must be adhered to. ESBL positive cases must have further assessment using the ESBL risk assessment flow chart, see Appendix 3, to assess the extent of contact precautions

#### **Restrictions on patient movements**

The purpose of isolation is to prevent the spread of MDRO to other patients and the environment.

#### **Visitors**

Visitors may be required to wear PPE (dependant on the type of MDRO). They must be instructed to wash their hands or use alcohol-based hand rub (ABHR) before and after visiting the patient. Visitors should be advised to undertake any other patient visits prior to visiting a patient in isolation by the staff looking after the patient.

CRE and VRE - Visitors for CRE, VRE positive patients must wear PPE regardless of other visiting on the Mercy Hospital Campus.

ESBL - Visitors for ESBL positive patients, no PPE is required to be worn, unless performing personal hygiene cares or visiting other patients following the isolated patient. See **Appendix 3** for guidance on PPE requirements, for ESBL positive patient visiting.

MRSA – Visitors for MRSA positive patients, no PPE is required to be worn, unless visiting other patients following the isolated patient.

### **Surgery**

Clearance is not possible prior to elective surgery for patients with ESBL, VRE, and CRE. However, suppression of MRSA is possible and treatment should be initiated at least 24 hours before surgery (refer MRSA decolonisation treatment for patients).

- If antibiotic prophylaxis is required, a Clinical Microbiologist should be consulted.
- There is no need to place patients with an MDRO last on the list as standard operating theatre precautions and cleaning procedures are sufficient. **But** consideration of the admitting areas must be taken into account. It is prudent for the patient to be placed last on the surgical list if possible. The patient will require to be in isolation once admitted into the admission areas of the Mercy Campus.

Lounge/waiting rooms do not need terminal cleaning, as no procedure such as cannulation has taken place.

- Operating Theatre staff must be informed of the patient's MDRO status.
- Appropriate infection prevention and control practices and decontamination (cleaning & disinfection) procedures should be maintained by all persons in direct contact with the patient. All equipment must be cleaned prior to removal from the isolation room.

### **Transfer of MDRO Positive Patients**

Colonisation or infection with an MDRO should not prevent the transfer of patients.

- MDRO infection or colonisation should not be a barrier to appropriate clinical care. Consequently hospital transfer for clinical reasons should not be prevented.
- Some MRSA patients may be transferred on topical clearance treatments. Ensure clearance treatment plans are clearly documented and any topical treatment accompanies the patient on transfer
- Prior to transfer, liaise with the receiving health care facility regarding the MDRO status of the patient.
- MDRO status should be indicated on any transfer documentation.

### **Discharge to the Community**

- A MDRO patient's medical discharge letter should inform the GP of the MDRO colonisation/infection and any treatment which has been given.
- Other health care agencies involved in the patient's care should be informed, e.g. District Nurse Services.
- If the patient is discharged to a long term care facility, the nursing staff must be informed in advance. MDRO colonisation or infection is not a contraindication to the transfer of a patient to a long term care facility.

### **Transportation to other Departments within the Hospital**

When transporting patients to other areas, e.g. Pacific Radiology, the ward orderly should be advised by clinical staff of any isolation requirements before collecting the patient. The receiving department must also be advised of the diagnosis and the need for precautions. Environmental cleaning e.g. X-ray bed and equipment, will be required prior to other patients being treated afterward. It would be prudent to have the isolated case treated last to limit exposure of MDRO to other patients.

- Encourage the patient to perform hand hygiene prior to leaving the room.
- Wheelchairs used for transporting the MDRO patients must be covered with a clean sheet or disinfected after use by the ward assistant or nurse with cleaner and disinfectant wipe currently approved for use.

Contact precautions remain in place for staff when transporting the patient.

### **Prevention of psychological effects of isolation**

Isolated patients may suffer from negative psychological effects. The following interventions may help to prevent this:

- Provide patients with information about their MDRO and explain the requirements and rationale for this.
- Ensure the patient is able to communicate effectively with staff e.g. can access a call bell.
- Encourage visits from family and friends.
- The door may remain open for Contact Precautions.

Education resources available are;

**Appendix 4** – MDRO screening (booklet)

**Appendix 5** – MRSA Patient Information Booklet

**Appendix 6** – ESBL Patient Information Booklet

**Appendix 7** – VRE Patient Information Booklet

**Appendix 8** – CRE Patient Information Booklet

In addition see Isolation Policy education resources;

**Appendix 8** – What you need to know Patient Information Booklet

**Appendix 9** – Isolation Information for Whanau Family and Friends Booklet

**Communication with patient, families, primary caregivers and visitors**

It is important that there is timely, open and effective communication with patients, families, primary caregivers and visitors.

It is important to remember that a positive result can be traumatic and evoke negative feelings for the patient and their support people. At a minimum people need to understand;

- The nature of the infection
- What this means for them
- How this will affect their/the patients care
- What transmission based precautions should be undertaken.

**Evaluation:**

**Staff**

- Staff health records
- Incident forms.

**Patient**

- Patient Admission Information Questionnaire
- Patient Assessment form - MDRO high risk status documentation
- Discharge Summary MDRO documentation
- Positive MDRO patient Trak alert status recorded
- High Risk healthcare providers and/or countries circulated to relevant Mercy staff
- Clinical notes
- Complaints
- Patient feedback.

## **Methicillin Resistant *Staphylococcus aureus* (MRSA)**

### **What is MRSA**

MRSA stands for Methicillin Resistant *Staphylococcus aureus*. The term is used to describe a number of strains of the bacterium *Staphylococcus aureus* which have developed resistance to antibiotics commonly used to treat staphylococcal infections. MRSA is an opportunistic bacterium which may colonise and grow readily on the skin and mucous membranes of a person, without harm to that person. It is commonly isolated from warm, moist body sites such as the nose, groin and perineum. MRSA colonisation can lead to infection such as infected skin lesions.

### **MRSA Risk Assessment - Staff**

All staff employed in direct patient contact roles are informed of MRSA screening requirements and the process as part of their employment and must return a negative MRSA screen before commencing duties.

### **Positive staff MRSA screening result**

Staff who have tested positive and then have had negative screens must continue to be screened for a three month period or as determined by the Infection Prevention and Control Nurse as re-colonisation may occur.

### **Returning staff**

Prior to recommencing employment, all personnel involved in direct patient care must present a negative MRSA result prior to commencing work, if they have;

- Worked in an overseas hospital in the last six months;
- Worked in a North Island hospital in the last six months;
- Worked in any hospital or residential facility that has had an MRSA outbreak in the last six months;
- Previously tested MRSA positive

Nursing staff and Credentialed Specialists who regularly work in other hospitals where MRSA cross infection is occurring must consult with the Infection Prevention and Control Nurse to determine a screening regime.

### **Students**

All students must have a negative MRSA screen within the last 6 months. If students are employed in a MDRO high risk category healthcare facility e.g. residential care, a negative MRSA result must be presented prior to commencing placement.

**Procedure for patients whose MRSA status is unknown and who meet the High Risk Screening Criteria**

Where a patient has been admitted and it is subsequently determined they meet the MDRO screening criteria, the following steps should be taken:

- An MDRO pending alert (flashing green/yellow star) must be placed on the Trak patient record by Booking Coordinator / Assistant
- Contact the Infection Prevention and Control Nurse
- If the patient is an inpatient, he/she should be domiciled if possible in a single room;
- The patient should continue to be managed in standard precautions.

**Booked patients who test MRSA positive prior to admission**

- If a patient returns a positive MRSA laboratory result, the admitting Credentialed Specialists and Bookings Coordinator must contact one of the following, prior to admission, to discuss treatment, admission and associated costs (as per Schedule of Fees):
- Director of Clinical Services,
- An appropriate Clinical Nurse Manager or Shift Leader
- The Infection Prevention and Control Nurse

Each case will be individually assessed for admission to Mercy Hospital by the Director of Clinical Services and/or Infection Prevention and Control Nurse in consultation with the relevant Credentialed Specialists and where necessary, microbiologist, to determine:

- Any delay in admission
- Appropriateness of decolonisation
- Type of surgery and length of stay
- Availability of single room for contact isolation management
- Urgency of surgery.

It is the responsibility of the admitting Credentialed Specialists to inform the patient of their positive MRSA result and the additional costs incurred for isolation management should admission be approved.

### **MRSA Testing**

MRSA screening may be undertaken for the following reasons:

1. Screening requirements determined from the Multidrug Resistant Organisms (MDRO) Risk Assessment Flow Chart, **Appendix 1**.
2. If found to be positive for MRSA from a pre-admission clinical sample and 3 clearance swabs have not been obtained
3. As part of outbreak management.

### **MRSA Specimens**

A bacterial swab is used to sample the following sites:

- Nasal Swab (one swab for both nostrils)
- Perineum Swab (natal cleft)

#### **Additional sites:**

- Catheter urine specimen if patient for screening has an indwelling urinary catheter
- Sputum from patient with recent MRSA respiratory tract infection (not nasal colonisation)
- Wound swab - including decubitus ulcer (pressure sore) or surgical wound and device insertion sites, e.g. IV, drains, suprapubic catheter

### **Specimen Collection Technique**

Take swabs as follows:

- Take one swab and rub over the anterior part of the inside of the nostrils several times.
- Take another swab, moisten with medium or sterile saline and rub over the perineum several times;
  - Males - the area between the anus and scrotum
  - Females - the areas between the anus and vagina

Take another swab to obtain sample from any possible sites of infection.

### **MRSA Decolonisation / Suppression Treatment for Patients**

<p>A pharmacological regime for decolonisation or suppression of MRSA colonisation may be undertaken. Decolonisation or suppression treatment is usually prescribed for 7 days unless otherwise advised. Treatment for longer than seven days may be considered e.g. for patients with chronic wounds. This should be</p>	<p>Mupirocin 2% ointment (Bactroban) 15g</p> <ul style="list-style-type: none"> <li>• Apply to nose (both sides) 3 times daily</li> <li>• Ointment must <b>only</b> be applied to the skin covered area of the anterior nares just inside the nostrils</li> <li>• Please use clean cotton buds for each application</li> </ul>
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discussed with a Microbiologist. The following regime is recommended <b>Treatment of the anterior nares (nose)</b>	
<b>Body wash and Shampoo</b>	<p>Adults and Children</p> <ul style="list-style-type: none"> <li>• Chlorhexidine gluconate 4% 500ml</li> <li>- Use daily as a body wash for showering</li> <li>Use twice weekly as a shampoo for hair washing</li> </ul>

**Note:** If the MRSA strain demonstrates resistance to Mupirocin 2% (Bactroban) alternative treatment options are available e.g. Bacitracin. Discuss with the Microbiologist.

### Clearance Screening

- Collection of swabs should commence 48 hours after completing decolonisation treatment regime or cessation of antimicrobial therapy.
- Three consecutive sets of negative swabs are required before the individual is considered 'clear' \* (each separated by at least 24 hours).
- The patient remains in isolation whilst waiting for results from all three sets of swabs.
- When all three sets of swabs are negative for MRSA, Contact Precautions can be discontinued.
- If the patient is discharged before three sets are obtained, the remaining sets of swabs **MUST** be obtained on future admissions before the patient is considered clear. The patient will require MRSA precautions until evidence of three clear sets of swabs.

\*Due to the possibility of re-colonisation, the patient must be advised that their national health identification number will be flagged with a MDRO alert and they will be required to be rescreened if readmitted to inpatient healthcare facilities.

### Care of the patient with MRSA

Following identification, the following steps should be implemented.

- Inform patient and commence contact precautions isolation
- Provide patient with information booklets (see page 6)
- Undertake terminal clean if moved from a multi-room
- Have prescribed and ensure commencement of topical MRSA treatment for the positive patient

- Complete the Isolation Check Sheet (**Appendix 2**, Patient Contact Isolation Check sheet, Isolation Policy -Transmission Based Precautions)
- Obtain full MRSA screen of patients who have shared the same room and any other high risk patients on the ward (where applicable and as directed by the Infection Prevention and Control Nurse)  
NB: contacts who have been screened do NOT require contact precautions OR decolonisation/suppression treatment while awaiting results. No new admissions will enter into the multi bed room while patients in the shared room are awaiting clearance. The room is deemed 'Orange risk', see isolation policy.
- Requirement for staff screening will be assessed and undertaken by the Infection prevention and Control Nurse
- Document MRSA status in the patient's notes. A MDRO 'Alert' with MRSA specified in the note section of the alert, will be placed on the TrakCare database by Bookings staff or Clinical Coordinator

## **Vancomycin-resistant Enterococci (VRE)**

### **What is a VRE?**

Enterococci are Gram-negative bacteria that are naturally present in the intestinal tract of all people. Vancomycin is an antibiotic to which some strains of enterococci have become resistant e.g. *Enterococcus faecalis* and *Enterococcus faecium*.

These resistant strains are referred to as VRE and are frequently resistant to other antibiotics generally used to treat enterococcal infections.

These antibiotic-resistant bacteria have infection prevention & control implications.

Source Reservoirs are;

- The gastrointestinal tract is the major reservoir of VRE's.
- Contaminated environment and equipment (particularly faecal contaminated equipment).

### **VRE risk assessment**

Assess the patient for screening using the for Multidrug Resistant Organisms (MDRO) Risk Assessment Flow Chart, see **Appendix 1**

Do **NOT** screen patients previously positive for VRE unless clinically indicated.

The following samples should be taken and 'VRE Screen' written on the request form:

- Rectal swab or faecal sample if appropriate

And if present,

- Indwelling urinary catheter specimen of urine (CSU)
- Wound swab / abdominal drain sample

### **Care of the Patient with VRE**

- Refer also to Isolation Policy - Transmission-Based Precautions
- Inform patient and commence contact precautions isolation
- Provide patient with information booklets (see page 6)
  - Hand hygiene with alcohol-based hand rub
  - Dedicated patient-care equipment or disinfect between use if shared with other patients e.g. blood pressure and oximetry equipment
  - Remove unnecessary equipment from room and ensure supplies are not overstocked within the room
  - If no ensuite shower is available the patient showers last in the communal shower and the shower is disinfected after use
- Visitors **MUST** wear PPE and perform hand hygiene after visiting the patient
- Seek advice from the Microbiologist for appropriate antimicrobial therapy

**Care when handling/disposing of body fluids is essential**

- Disposal in sluice is very high risk for environmental contamination
- Ensure apron and gloves are worn and disposed of after use in infectious waste in sluice room
- Dispose of waste into sluice, taking care not to cause splashing
- If possible, place the waste receptacle into the sanitiser immediately
- Clean and disinfect sluice bench with disinfectant wipe currently approved for use after disposing of body fluid regardless of whether any spillage occurs
- Perform hand hygiene using antimicrobial liquid soap or alcohol based hand rub on removal of aprons and gloves
- Seek advice from the Microbiologist for appropriate antimicrobial therapy

**Previously Positive Patients**

- Decolonisation of patients with VRE is not recommended so it is likely that a previously positive patient will remain positive during subsequent admissions.
- If previously positive patients are readmitted to hospital, obtain only those samples that are clinically indicated, e.g. if symptoms of urinary tract infection are present obtain a urine specimen.
- Care of previously positive patient will be the same as above if readmitted (see Care of the Patient with VRE).

## Extended-Spectrum Beta-Lactamase (ESBL) Producing Organisms

### What is an ESBL

An ESBL is an enzyme produced by certain bacteria that inactivates penicillin and related  $\beta$ -lactam resulting in resistance to that antibiotic. These antibiotic-resistant bacteria have infection prevention and control implications. ESBL's occur in Gram negative bacteria, e.g. *E. coli*, *Klebsiella sp.* Source reservoirs are;

- The gastrointestinal tract is the major reservoir of ESBLs.
- Contaminated environment and equipment (particularly faecal contaminated equipment).

### ESBL risk assessment for screening

Assess the patient for screening using the for Multidrug Resistant Organisms (MDRO) Risk Assessment Flow Chart, see **Appendix 3**

Do **NOT** screen patients previously positive for ESBL unless clinically indicated. The following samples should be taken and 'ESBL Screen' written on the request form:

- Rectal swab /or if appropriate a faeces sample
- Indwelling urinary catheter specimen of urine (CSU)
- Wound swab / abdominal drain sample

### Care of the Patient with ESBL

NOTE- all positive *Klebsiella pneumonia* ESBL are HIGH RISK, and must be nursed in contact precautions regardless of the absence of other risk factors according to **Appendix 3**.

For all other ESBL, assess patient for risk of ESBL transmission to determine appropriate placement and required precautions. Provide the patient with appropriate education material (see page 6).

The following factors put patients at high risk of spreading ESBL-producing bacteria:

- Diarrhoea, urinary or faecal incontinence
- Abdominal drainage/stoma
- Indwelling urinary catheters/intermittent clean catheterisation
- Large wounds that need dressing
- Non-compliance with hygiene principles
- High dependency for cares

For Medium risk ESBL patients:

- Contact precautions are required for hygiene care only
- Patients to have dedicated bathroom or commode

For high risk ESBL patients:

- Refer also to Isolation policy - Transmission-Based Precautions
- Inform patient and commence contact precautions isolation
- Provide patient with information booklets (see page 6)
- Hand hygiene with antimicrobial liquid soap or alcohol-based hand rub
- Dedicated patient-care equipment or disinfect between use if shared with other patients e.g. blood pressure and oximetry equipment
- Remove unnecessary equipment from room and ensure supplies are not overstocked within the room
- If no ensuite shower is available the patient showers last in the communal shower and the shower is disinfected after use
- Visitors do not wear PPE but are encouraged to perform hand hygiene after visiting the patient
- Seek advice from the Microbiologist or Infectious Diseases for appropriate antimicrobial therapy

**Care when handling/disposing of body fluids is essential.**

- Disposal in sluice is very high risk for environmental contamination
- Ensure apron and gloves are worn and disposed of after use in infectious waste in sluice room
- Dispose of waste into sluice, taking care not to cause splashing
- If possible, place the waste receptacle into the sanitiser immediately
- Clean and disinfect sluice bench and sanitiser handle with disinfectant wipe currently approved for use after disposing of body fluid regardless of whether any spillage occurs
- Perform hand hygiene using an antimicrobial liquid soap or alcohol based hand rub on removal of aprons and gloves

**Previously Positive Patients**

- Decolonisation of patients with ESBL is not recommended so it is likely that a previously positive patient will remain positive during subsequent admissions.
- If previously positive patients are readmitted to hospital, obtain only those samples that are clinically indicated, e.g. if symptoms of urinary tract infection are present obtain a urine specimen.
- Care of previously positive patient will be the same as above if readmitted, that is based on a risk assessment on admission (see Care of the Patient with ESBL and Appendix 3).

## **Carbapenem Resistant Enterobacteriaceae CRE also known and Carbapenemase Producing Enterobacteriaceae (CPE) and CPO, Carbapenemase Producing Organisms.**

### **What is CRE**

Carbapenem-resistant *Enterobacteriaceae* (CRE) are *Enterobacteriaceae* that are non-susceptible to carbapenem antibiotics. Carbapenemase-producing *Enterobacteriaceae* (CPE) are defined as any of the CRE that harbor a gene encoding Carbapenemase (a  $\beta$ -lactamase). CPE are often also resistant to many other classes of antimicrobial agents. CRE are found mostly in the gastrointestinal system and are screened via rectal swab (or fecal sample).

Carbapenemase-producing *Enterobacteriaceae* (CPE) is the newest in a long line of 'superbugs' ... and [is] a particular problem in hospital settings. Of all the superbugs, CPE is the most difficult to kill with antibiotics.

The World Health Organization (WHO), Centre for Disease Control [CDC] and the European Centre for Disease Prevention and Control (ECDC) all identify that infections with CPE are a serious threat to patient safety due to their resistance to multiple antimicrobials, meaning that there are very few treatment options for infected patients. Patients with CPE experience poorer patient outcomes, increased morbidity, mortality and have higher associated hospital costs.

An Roinn Sláinte Department of Health, 2017, page 4

Majority of cases of infection or colonisation by CPE is detected by surveillance at health care facilities. Carriage and infection has been internationally sourced in the past, but increasingly cases are now found in New Zealand that are native to New Zealand. CPE has a high mortality rate and may be completely resistant to antibiotics.

CRE transmission is rapid due to global movements, medical tourism and through transmission of plasmids carrying the gene from one bacterium to another. CRE is established in countries of high, middle and low incomes. The Indian subcontinent is the source of two-thirds of CRE identified in New Zealand.

### **CRE transmission**

Transmission in the healthcare environment is through contaminated environment or contaminated hands. Hand hygiene of patients and staff is imperative in preventing transmission.

CRE can live in moist and dry environmental surfaces such as

- Equipment
- Solutions
- Food and/or water

### **CRE risk assessment**

Please see **Appendix 1**, MDRO assessment flow chart. A CRE positive status is HIGH risk for staff, cleaning and food delivery.

Vigilant screening for travel/overseas healthcare work or exposure is extremely important for CRE screening. Overseas travel, working in an overseas hospital or receiving healthcare in an overseas facility is the criteria that qualifies for CRE screening.

Additionally, receiving treatment or working in a north island hospital especially in the Auckland region qualifies for CRE screening. MDRO high risk hospital list will be maintained for hospitals with known CRE cases.

Risk of CRE infection or colonisation is higher in those that are immune compromised and/or have had close proximity to others infected or colonised with CRE

**In the event of strongly suspected/Confirmed CRE case the Director of Clinical services and IPC nurse MUST be contacted. Cases MUST be reported to the Ministry of Health via email [notifycommndiseases@health.govt.nz](mailto:notifycommndiseases@health.govt.nz) by IPC Nurse or Clinical Nurse Manager.**

Advice must be sought from Southern District Health Board Infectious Diseases Physicians, Clinical Microbiology Services at Southern Community Laboratory.

### **CRE Screening specimens**

The highest sensitivity for detecting CRE in the asymptomatic patient is a rectal swab with evidence of faecal matter on the swab or a faeces specimen.

Additionally samples from the following should also be considered if applicable

- Discharging wounds
- Urine sample from intermittent or continuous urinary catheterisation
- Tracheal aspirate
- Stomal specimen

### **CRE Outbreak Definition**

An outbreak is more cases of infection than typically expected in a given area, among a specific group of people, over a particular period of time, for example:

- two or more units experience related CRE cases within 12 months
- single cases with the same CRE molecular epidemiology are found in more than one unit
- two or more patients in a defined clinical area with positive CRE colonisation several epidemiologically-linked CRE isolates, or an increase in numbers of cases over a baseline, are detected.

### **Care of the Patient with CRE**

Please see **Appendix 2**, MDRO flow chart for nursing clinical decision making. The patient must be cared for in contact isolation.

- Refer also to Isolation Policy
- Inform patient and commence contact precautions isolation
- Provide patient with information booklets (see page 6)
- If the patient has a respiratory infection/and or is coughing, Droplet precautions will be required, and the patient will be required to wear a mask if being transported or transferred.
- Hand hygiene with alcohol-based hand rub
- Dedicated patient-care equipment
- Remove unnecessary equipment from room and ensure supplies are not overstocked within the room
- Visitors **MUST** wear PPE and are to perform hand hygiene after visiting the patient.
- Seek advice from the Microbiologist for appropriate antimicrobial therapy (if any)

### **Care when handling/disposing of body fluids is essential.**

- Disposal in sluice is very high risk for environmental contamination
- Ensure apron and gloves are worn and disposed of after use in infectious waste in sluice room
- Dispose of waste into sluice, taking care not to cause splashing
- If possible, place the waste receptacle into the sanitiser immediately
- Clean and disinfect sluice bench and sanitiser handle with disinfectant wipe currently approved for use after disposing of body fluid regardless of whether any spillage occurs
- Perform hand hygiene using an antimicrobial liquid soap or alcohol based hand rub on removal of aprons and gloves.

### **Previously Positive Patients**

Patient **MUST** be rescreened prior to admission to hospital. Admission to hospital must be in consultation of the IPC nurse and the Director of Clinical Service.

If the rescreening result is negative- the patient may be admitted as usual and Standard Precautions apply.

If positive- notification to Ministry of Health by email must be completed and, SDHB Infectious Diseases Physician, Clinical Microbiologists and IPC Charge Nurse Manger should be advised and advice sort.

Tracking of the patient's contacts will need to be undertaken to limit spread.

### **Patient Movement**

Unnecessary transfer of CRE-positive patients should be avoided as much as possible, and patients with a suspected or known CRE should be encouraged to stay in their rooms. In acute care, patients with a suspected or known CRE should be kept away from communal areas where possible. It may be necessary for these patients to attend facilities such as an X-ray room or physiotherapy clinic. In this case, the facility should be informed of the patient's status before the visit occurs so that full infection contact precautions can be applied. Following such visits, thorough environmental cleaning and disinfection must be undertaken before any other patients are allowed access to the facility.

CRE-status should not preclude patients from being transferred, but strict contact precautions should be maintained if they do need to be transferred.

If CRE-positive patients are to be transferred to a non-inpatient setting or aged residential care facility, an IPC management plan should be in place beforehand. Before discharge into the community, the patient's primary health care provider and the public health unit needs to be informed of the patient's status, and the patient and any relevant care giver(s) should be provided with relevant information on how to manage the CPE infection.

It is important to provide information to colonised or infected patients to help them understand why they are in isolation and why their movements is limited.

## **Appendices**

- Appendix 1 - MDRO Flow Chart – Consultant rooms screening
- Appendix 2 - MDRO Flow Chart – Clinical decision making for nurses
- Appendix 3 - MDRO Flow Chart – ESBL risk assessment
- Appendix 4 – MDRO screening (booklet)
- Appendix 5 – MRSA Patient Information Booklet
- Appendix 6 – ESBL Patient Information Booklet
- Appendix 7 – VRE Patient Information Booklet
- Appendix 8 – CRE Patient Information Booklet

## **References**

### **Associated Documents**

#### **Internal**

- Standard Precautions Policy
- Disease Specific Isolation Precautions Patient Management Policy
- Management of Staff with Communicable Disease Policy
- Outbreak Management Policy
- Isolation Policy- transmission based precautions and appendices
- Antimicrobial Policy
- Waste Management Policy
- Environmental Cleaning Policy
- Laundry Policy
- Transfer of Patients Policy
- Discharge Policy
- Clinical Records Policy
- Personal Protective Equipment - Infection Control Policy
- Pre admission – Trak Electronic Alert System
- Pre admission- Telephone calls assessment process
- Bookings Coordinator
- By-Laws for Credentialed Specialists
- Application for Employment, Human Resources
- Schedule of Fees
- New Zealand Formulary

## **External**

An Roinn Sláinte Department of Health. 2017. *National Public Health Emergency Team on Carbapenemase Producing Enterobacteriaceae (CPE) Situational Analysis*. An Roinn Sláinte Department of Health: Dublin. Retrieved from: <https://health.gov.ie/wp-content/uploads/2017/12/NPHET-on-CPE-Situational-Analysis-Report-21-December-2017.pdf>

Australian Commission on Safety and Quality in Health Care. *Recommendations for the control of Multi-drug resistant Gram-negatives: carbapenem resistant Enterobacteriaceae (October 2013)*. Sydney. ACSQHC, 2013.

Guidelines for the Control of Methicillin-resistant Staphylococcus aureus in New Zealand. August 2002, Ministry of Health, Wellington

Guidelines for the Control of Multi-drug Resistant Organisms in New Zealand (2007), Ministry of Health, Wellington

Infection Prevention and Control and management of Carbapenemase-producing Enterobacteriaceae, Guideline for health care providers in New Zealand acute and residential care facilities (2018), Ministry of Health, Wellington

Lippincott Clinical Procedures, Guidelines for the Control of Multi-drug Resistant Organisms

## **Acknowledgement**

Dr James Usser- Microbiologist

Dr Antje van der Linden – Microbiologist

Jo Stodart – Charge Nurse Manager, Infection Prevention and Control, Southern District Health Board

Francie Morgan – Infection Preventionist Nurse Specialist, Mercy Ascot

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