Guidelines for the Control of Multidrug Resistant Organisms

Contents

Policy

Infection prevention and control measures are implemented to minimise the increase and cross infection of multi-drug resistant organisms (MDRO) in CDHB healthcare facilities.

Purpose

To prevent and control the spread of Multi Drug-Resistant Organisms (MDRO) in the Canterbury DHB hospital facilities.

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

Scope/Audience

All Canterbury DHB staff.

Definitions

MDRO can be defined as 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).

MDRO organisms

The MDRO organisms covered in these guidelines include:

- MRSA (Methicillin resistant *Staphylococcus aureus*)
- ESBL (Extended-spectrum beta-lactamase producing enterobacteriaceae)
- VRE (Vancomycin-resistant Enterococci)
- CRE (Carbapenem-resistant Enterobacteriaceae)
- Other MDRO
  - Plasmid Amp-C producing coliforms
  - Other multi-drug resistant Gram-negative organisms e.g. Acinetobacter species

Associated documents

- CDHB IPC Policy Transmission-based Precautions (Isolation Guidelines)
- Multidrug Resistant Organisms (MDRO) Admission Assessment Tool
- ESBL Risk-based Assessment for Patient Placement
- Information Pamphlets
  - 'Why am I being nursed in Isolation'? (Ref: 0106)
  - MRSA Information for Patients and Visitors (Ref: 0206)

- ESBL Producing Organisms – Multi-Drug Resistant Organisms. Information for patient and visitors (Ref: 1895)
- Vancomycin-resistant Enterococci, patient/ visitor information (Ref: 2406)
- CRE patient and visitor information fact sheets on IPC Intranet site

1.1 General Background

MDRO are of concern because they:

- are resistant to usual antimicrobial therapy
- increase patient morbidity and mortality
- add to the cost of treatment
- have the potential to spread
- act as a reservoir of resistant genes for transmission to other organisms

A combination of measures is required to control the spread of MDRO including antimicrobial stewardship, infection prevention and control interventions and appropriate screening.

1.2 Mode of transmission

Contact transmission is the primary mode of spread for MDRO via:

- Transient carriage on the hands of health care workers
- Contamination of surfaces and equipment

1.3 Risk Assessment for MDRO colonisation

All patients are assessed for MDRO colonisation if they are going to be admitted for greater than 24 hours or have an invasive procedure such as endoscopy, minor surgery or an intravenous procedure (excludes phlebotomy).

Assessment includes checking for current MDRO alerts on the patient management system (Homer), Health Connect South and the monthly cross infection list from IP&C. Also ask for previous hospitalisation history and other risk factors as noted in the Multidrug Resistant Organisms (MDRO) Admission Assessment Flowchart

Information from risk assessments will inform precautions required and whether a patient requires screening.

This assessment is the responsibility of all admission areas including inter-hospital transfers if there are no documentation that it has been carried out previously

1.3.1 Responsibilities for identifying MDRO alerts

Admitting staff (Ward clerks/nursing staff) are responsible for identifying information about the patient's previous MDRO alerts:

- Check the patient management system for previous MDRO alerts (see also 1.3.5)
- Print the page of any alerts documented
- Place the alert printout in front of clinical notes for clinical staff

1.3.2 Screening risk assessment

Regardless of whether the patient has a documented alert, the admitting nursing staff **must** undertake a screening risk assessment for MDRO using the Multidrug Resistant Organisms (MDRO) Admission Assessment Flowchart (Appendix 1).

Patients who are screened for hospital admissions other than overseas or Auckland do not require isolation or contact precautions while pending results. This change in practice is based on an IP&C review of the New Zealand and overseas MDRO epidemiology. Hand hygiene and standard precautions will minimise transmission.

Some clinical services e.g. BMTU, Burwood Spinal Unit, may have a specific screening regime.

1.3.3 Screening requirements

Refer to the Multidrug Resistant Organisms (MDRO) Admission Assessment Flowchart (Appendix 1) for details of which patients to screen for MRSA and MDRO (VRE, ESBL & CRE)

Screening requirements differ between previously identified MDRO patients and those whose status is unknown.

1.3.4 Laboratory screening requirements

MRSA – refer 1.5.4

ESBL, VRE & CRE - the following specimens are sent:

- Faeces sample /anal swab with visible faecal matter. The same swab/faecal sample can be used for all three MDRO
- Indwelling urinary catheter specimen of urine (CSU)
- Wound swab / abdominal drain sample
- On the laboratory form request 'MDRO screen' if all three are required; otherwise specify the test e.g. ESBL

1.3.5 MDRO alerts

- An 'ALERT' will be entered on the Patient Management System (PMS) by the Infection Prevention and Control Service following notification to them of a MDRO positive result. These alerts are visible as warnings on Health Connect South under 'National Medical Warnings'.
- Additional details of the MDRO may also be entered in the PMS 'Comments' field, e.g. organism for MDRO.
- MDRO alerts may only be removed by the IP&C Service.
- PMS Alerts must be checked for all admissions and relevant information entered on to admission and transfer documentation

1.4 General Considerations for the care of MDRO positive patients

In general MDRO positive patients are cared for with Standard and Contact Precautions. ESBL positive patients require further assessment as per Section 1.6.3.

1.4.1 Prevention of psychological effects of isolation

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

- Ensure the patient is able to communicate effectively with staff e.g. can access a call bell.
- Provide patients with information about their MDRO and explain the requirements and rationale for these.
- Encourage visits from family and friends.
- Keep the door or curtains open for Contact Precautions if the patient prefers.
- Do not restrict the use of a telephone – ensure the telephone is disinfected after use with an alcohol-based disinfectant wipe.

1.4.2 Visitors

Visitors are not required to wear PPE but staff inform them to:

- wash their hands or use alcohol-based hand rub (ABHR) after visiting the patient.
- visit other patients prior to visiting the patient in isolation.

1.4.3 MDRO patients requiring surgery

- Clearance is not possible prior to elective surgery for patients with ESBL, VRE or CRE. However, suppression of MRSA in a patient currently screening positive is possible. The treatment should be initiated at least 24 hours before surgery (refer 1.5.5 MRSA decolonisation treatment for patients).
  - If considered clinically appropriate, MRSA decolonisation in pregnancy should be initiated as close to delivery date as possible.
- If antibiotic prophylaxis is required, the patient's colonisation status should be considered. A Clinical Microbiologist or Infectious Diseases physician may be able to advice.
- There is no need to place patients with an MDRO last on the list as standard operating theatre precautions and cleaning procedures are sufficient.
- Transport and 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.

1.4.4 Patient movement within the ward

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

Encourage patients to avoid communal ward lounges and other patient rooms, unless otherwise specified by the CNS-IP&C.

The patient may go outside the hospital at any time. However when leaving their room, they should:

- Always perform hand hygiene prior to leaving their room
- Have all wounds covered with no strike-through of wound ooze

1.4.5 Transportation to other departments within the hospital

When transporting patients to other departments for investigations, , the orderly staff should be advised of the isolation requirements before collecting the patient. The receiving department must also be advised of the diagnosis and the need for precautions.

- Encourage the patient to perform hand hygiene prior to leaving the room.
- The orderly does not require PPE during transportation as good hand hygiene following contact will be sufficient.

- On exiting the isolation room, orderlies must remove any PPE that has been used within the isolation room and then perform hand hygiene
- Once the patient has been delivered to the department, orderlies must again perform hand hygiene
- Standard Precautions are sufficient during transport to the mortuary
- If Patients require treatment in support facilities such as physiotherapy or swimming an Infection Prevention & Control Nurse Specialist should be consulted regarding precautions required

1.4.6 Transfer to another hospital

- MDRO infection or colonisation should not be a barrier to appropriate clinical care. Consequently, inter-hospital transfer for clinical reasons should not be prevented.
- Good communication about the patient's MDRO status is essential for hospital transfers. Communication with the receiving hospital must take place as early as possible prior to transfer.
- Communication includes:
  - ongoing requirement for transmission-based precautions
  - topical clearance treatment plan if transferred on MRSA decolonisation including
  - MDRO status noted any transfer documentation.

1.4.7 Discharge to the Community

- MDRO patients should be discharged promptly from hospital when their clinical condition allows.
- The 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. CREST, District Nurse Services.
- If the MDRO is newly identified in a patient transferring to a long term care or aged residential care facility, the clinical staff at the facility must be informed, preferably in advance of the patient discharge. MDRO colonisation or infection is not a contraindication to the transfer of a patient to a long term care facility.
- The IPC Liaison CNS for LTCF may be contacted to provide advice to a LTCF if required.

1.4.8 Ambulance and Inter-hospital Shuttle transfers

- Standard Precautions are implemented by Ambulance staff for MDRO transfers
- Hand hygiene must be undertaken before and after contact with MDRO positive patients as per The 5 Moments for Hand Hygiene.
- Any bedding used for the transfer must be changed
- Disinfect bed/wheelchair after use as per policy. (Additional cleaning of the rest of the ambulance is not usually required after transporting a MDRO positive patient.)
- Ambulance Services should be notified in advance if the patient is considered high risk of transmission of the MDRO to other ambulance patients e.g. a discharging lesion which cannot be enclosed by an impermeable dressing, or widespread colonised skin lesions. Contact the IPC Service for advice if required.

1.5 Methicillin Resistant Staphylococcus aureus (MRSA)

1.5.1 Introduction

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.

1.5.2 MRSA Risk Assessment

All patients are assessed if they are going to be admitted for greater than 24 hours or have an invasive procedure such as endoscopy, minor surgery or an intravenous procedure (excludes phlebotomy) – see Section 1.3.

Regardless of whether the patient has a documented MRSA alert admitting nursing staff **must** undertake risk assessment using the Multidrug Resistant Organisms (MDRO) Admission Assessment Flowchart (Appendix 1).

A MRSA risk assessment is not required for transfers between CDHB hospitals when an initial admission assessment has been undertaken in the original facility.

1.5.3 Care of the patient with MRSA

- Standard and Contact Precautions apply at all times. Refer also to CDHB IPC Policy, Transmission-Based Precautions Guidelines
- Hand hygiene is performed according to The 5 Moments for Hand Hygiene with either antimicrobial liquid soap or alcohol-based hand rub
- Care for the patient in a single room/cubicle. In the event that the patient is cared for with Contact Precautions in a bed space in a multi-bed room, signage must be clearly visible
- Dedicated toilet facilities (if ensuite not available, allocate own commode chair in room or dedicated toilet)
- If no ensuite shower is available, the patient showers last in the communal shower and the shower is cleaned and disinfected after use
- Dedicated patient-care equipment or disinfect between use if shared with other patients e.g. blood pressure and oximetry equipment
- Remove unnecessary equipment from isolation room and ensure supplies are not overstocked within the room
- 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 for MRSA infections
- MRSA suppression treatment may be considered to reduce the MRSA burden in the patient's environment and on their skin (refer 1.5.5)

1.5.4 MRSA Testing

MRSA screening may be undertaken for **the following reasons:**

- Screening requirements determined from the Multidrug Resistant Organisms (MDRO) Admission Assessment Flowchart (Appendix 1)
- If found positive after admission from a clinical sample
- As part of outbreak management
- As part of contact screening of patients

Screening of patients during antibiotic therapy may provide false negative results.

Results from MRSA screening take approximately two to three days. Swabs will be tested for presence of MRSA only.

MRSA Specimens

A purple bacterial swab is used to sample the following sites:

- Nasal Swab (one swab for both nostrils)
- Groin Swab (one swab for both sides)
- Perineum Swab (natal cleft)
- Wound swab – including decubitus ulcer (pressure sore) or surgical wound
- Device insertion sites, e.g. IV, tracheostomy, drains, PEG, suprapubic
- Umbilicus in neonates
- Catheter urine specimen if patient for screening has an indwelling urinary catheter
- Sputum from patient with recent MRSA respiratory tract infection (not nasal colonisation)

Specimen Collection Technique

Step	Action
1	Moisten the swab using the transport media in the tube, directly before use
2	Rub the pre-moistened swab over the indicated area(s) indicated above, several times
3	Clearly label all specimens. – Name – Date of Birth – NHI Number – Site swabbed
4	Use one laboratory form per person Request: MRSA screen Please indicate on the form if previously posiitve
5	Place specimens and laboratory form in laboratory specimen bag and send to laboratory

1.5.5 MRSA Decolonisation/Suppression Treatment for Patients

A pharmacological regime for decolonisation or suppression of MRSA colonisation may be undertaken.

Decolonisation or suppression treatment is usually prescribed for seven days unless otherwise advised.

Treatment for longer than seven days may be considered e.g. for patients with chronic wounds, discuss with Infectious Diseases.

The following regime is recommended:

Treatment of the anterior nares (nose)	Mupirocin **2%** ointment (Bactroban) • Apply to nose (both sides) **3 times daily** • Ointment must **only** be applied to the skin covered area of the anterior nares just inside the nostrils • Please use clean cotton buds for each application
Body wash and shampoo	**Adults and Children** Chlorhexidine Gluconate 4% Skin Cleanser (Microshield) • **Use daily** as a body wash for showering • **Use twice weekly** as a shampoo for hair washing **Infants <12 months** 1% chlorhexidine cream **Apply daily** to all areas of the skin then rinse off in the bath. Can also be used on head.

Note: If the MRSA strain demonstrates resistance to Mupirocin 2% (Bactroban) alternative treatment options are available e.g. Bacitracin, Betadine ointment.

Precautions/Contraindications

Refer to MIMS.

1.5.6 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.
- Antimicrobial stewardship is important

*Due to the possibility of re-colonisation, the patient must be advised that a MRSA 'Alert' will placed on their record in the local and national patient management system and they may be rescreened on future admissions.

'Clear' should be interpreted as "below laboratory detection" as treatment with antibiotics to which the MRSA is resistant might result in increase in colonisation which can be detected again by testing

1.5.7 Patients Found MRSA Positive after Admission

Following identification, the following steps should be implemented. The Infection Prevention and Control Service will provide further advice as required.

Step	Action
1	Inform patient and commence Contact Precautions in single room Provide patient with patient information pamphlet, 'MRSA Information for Patients and Visitors' (Ref: 0206)
2	Undertake bed space disinfection if moved from a multi-room NB: Change privacy curtains if inpatient for ≥24 hours or for any patient who has open discharging wounds
3	Obtain full MRSA screen from the patient
4	Commence topical MRSA decolonisation treatment for the positive patient
6	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 Service). Contacts should not be screened if less than 24 hours in the same room or ward as the index case NB: contacts who have been screened do NOT require contact precautions OR decolonisation/suppression treatment while awaiting results

Step	Action
7	Requirement for staff screening will be assessed and undertaken by the IP&C Service
8	Document MRSA status in the patient's notes. A MRSA 'Alert' will be placed on the PMS database by the IP&C Service

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

For paediatrics refer CDHB Intranet Guidelines for the Management of Children Colonised with Extended Spectrum Beta-Lactamase (ESBL) Positive Bacteria

1.6.1 Introduction

- An ESBL producing organism is an enzyme produced by certain bacteria that inactivates penicillin and related ß-lactams resulting in resistance to that antibiotic. These antibiotic-resistant bacteria have infection prevention & control implications.
- ESBL's occur in Gram negative bacteria, commonly those enterobacteriacae in the bowel e.g. *E. Coli*, Klebsiella species.
- ESBL Klebsiella species is more transmissible within hospitals and therefore requires contact precautions
- The gastrointestinal tract is the major reservoir for ESBLs.
- Contaminated environment and equipment are also potential sources(particularly faecal contaminated equipment)

1.6.2 ESBL risk assessment for screening

Assess the patient for screening using the Multidrug Resistant Organisms (MDRO) Admission Assessment Flowchart (Appendix 1).

This chart is used in conjunction with the monthly 'MDRO cross infection list' available on the IP&C Intranet site.

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:

- Faeces sample or anal swab with visible faecal matter
- Indwelling urinary catheter specimen of urine (CSU)
- Wound swab / abdominal drain sample

1.6.3 Assess the patient for risk of transmission of ESBL

For paediatric patients refer to the Guidelines for the Screening and Management of children for ESBL

- Determine the causative ESBL organism e.g. *E.coli, Klebsiella pneumonia,* other Klebsiella species and other Enterobacteriacae as this will determine the level of precautions required.
  - Previously identified ESBL patients will have the organism information on their PMS 'Alert'. If in doubt, contact the IPC Service.
- Assess the patient for risk of ESBL transmission using the coloured chart Adult ESBL Risk-based Assessment for Patient Placement' (Appendix 2) to determine appropriate placement and required precautions.
  - Patients are assessed as a low, medium or high risk of spread
- The following factors put patients at risk of spreading ESBL-producing bacteria and will place the patient in a medium or high risk:
  - Diarrhoea, urinary or faecal incontinence
  - Abdominal drainage/stoma
  - Indwelling urinary catheters/intermittent clean catheterisation
  - Large wounds that need dressing
  - Non-compliance with basic hygiene
  - High dependency for cares
  - ESBL Klebsiella species
- Further advice may be required from the IP&C Service for rehabilitation patients
  - Use of a hydrotherapy pool may be considered following discussion with IPC and meeting specific criteria. Please refer to Appendix 3
- NB: A current infection with an ESBL organism e.g. UTI, is not a risk factor in itself. Please refer to flow chart for risk factors for spread of ESBL e.g. incontinence.

1.6.4 Care of the Patient with ESBL

Precautions for patients categorised as Low Risk of spread for ESBL - does not apply to ESBL Klebsiella species

Patients categorised as low risk do not have any risk factors - that is they are usually only colonised with ESBL in the bowel

- Standard Precautions apply at all times
- May be nursed in a multi bed room
- Shared toilet facilities
- Shared equipment must be cleaned after use
- No restrictions on patient movement
- Inform patients of importance of good hand hygiene

Precautions for patients categorised as Medium Risk of spread of ESBL – includes ESBL Klebsiella species

Patients categorised as medium risk may have one or more of the following risk factors:

- Abdominal drainage or stoma
- Tracheostomy
- Indwelling urinary catheter or intermittent clean catheterisation
- Large wounds that require dressings
- High levels of hand on care
- Non-compliance with basic hygiene

The following precautions are applied

- Standard Precautions apply at all times
- Contact Precautions for hygiene and toileting cares
- Single room but no restrictions on patient movements outside of room
- Own toilet facilities (if ensuite not available, allocate own commode chair in room or dedicated toilet)
- If the patient has their own commode chair please refer to 1.6.5 – Handling/disposal of body fluids
- Dedicated patient-care equipment or disinfect between use if shared with other patients e.g. blood pressure and oximetry equipment
- If no ensuite shower is available the patient showers last in the communal shower and the shower is disinfected after use
- Hand hygiene with antimicrobial liquid soap or alcohol-based hand rub
- Visitors do not wear PPE but are encouraged to perform hand hygiene after visiting the patient
- Inform patients of importance of good hand hygiene

Precautions for patients categorised as High Risk

Patients are categorised as high risk if they diarrhoea or any urinary or faecel incontinence

- Standard and Contact Precautions
- Single room
- Own toilet facilities (if ensuite not available, allocate own commode chair in room or dedicated toilet)
  - If the patient has their own commode chair please refer to 1.6.5 – Handling/disposal of body fluids
- If no ensuite shower is available the patient showers last in the communal shower and the shower is disinfected after use
- 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
- Visitors do not wear PPE but are encouraged to perform hand hygiene after visiting the patient
- Patients should **not use** communal areas in the ward
- Inform patients of importance of good hand hygiene

1.6.5 Handling/disposing of body fluids.

- Care when handling/disposing of body fluids is essential
- Disposal in the dirty utility room poses a very high risk for environmental contamination
- Ensure apron and gloves are worn and disposed of after use in infectious waste in dirty utility room
- Dispose of waste into sluice sink, taking care not to cause splashing
- If possible, place the waste receptacle into the sanitiser immediately
- Clean and disinfect sluice sink bench and sanitiser handle with dilute chlorine-based disinfectant after disposing of body fluid regardless of whether any spillage occurs
- Perform hand hygiene using either ABHR or the antimicrobial (green) liquid soap on removal of aprons and gloves

1.6.6 Previously ESBL Positive Patients

- An effective decolonisation regime for patients with ESBL is not established so it is likely that a previously positive patient will remain positive during subsequent admissions.
- There are currently no nationally or internationally agreed clearance criteria.
- 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 Assess the patient for risk of transmission of ESBL).
- On occasions the IPC Service may review a VRE case regarding ongoing requirements for Contact Precautions.

1.7 Vancomycin-resistant Enterococci (VRE)

1.7.1 Introduction

What is a VRE?

Enterococci are Gram-positive 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 Reservoir

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

1.7.2 VRE risk assessment

Assess the patient for screening using the Multidrug Resistant Organisms (MDRO) Admission Assessment Flowchart (Appendix 1).

This chart is used in conjunction with the monthly 'MDRO cross infection list' available on the IP&C Intranet site.

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:

- Anal swab with visible faecal matter or preferably a faeces sample
- Indwelling urinary catheter specimen of urine (CSU)

- Wound swab / abdominal drain sample

1.7.3 Care of the Patient with VRE

- Refer also to CDHB IPC Policy, Transmission-Based Precautions Guidelines
- Single room
- Standard and Contact Precautions with **own toilet facilities** (if ensuite not available, allocate own commode chair in room or dedicated toilet)
- 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 isolation 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

1.7.4 Handling/disposing of body fluids

- Care when handling/disposing of body fluids is essential.
- Disposal in dirty utility is very high risk for environmental contamination
- Ensure apron and gloves are worn and disposed of after use in infectious waste in dirty utility 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 chlorine based disinfectant after disposing of body fluid regardless of whether any spillage occurs
- Perform hand hygiene using either ABHR or the antimicrobial (green) liquid soap on removal of aprons and gloves

1.7.5 Patients Found VRE Positive after Admission

Following identification, the following steps should be implemented. The Infection Prevention and Control Service will provide further advice as required.

Step	Action
1	Inform patient and commence Contact Precautions in single room Provide patient with patient information pamphlet, VRE Patient/Visitor Information (Ref: 2406)
2	Undertake bed space disinfection if moved from a multi-room NB: Change privacy curtains if inpatient for ≥24 hours or for any patient who has open discharging wounds
6	Screen patients who have shared the same room and any other high risk patients on the ward for VRE (refer 1.7.2 for sampling sites). Consult with the Infection Prevention and Control Service. Contacts should not be screened if less than 24 hours in the same room or ward as the index case NB: contacts who have been screened do NOT require contact precautions while awaiting results
7	There is no requirement for staff screening
8	Document VRE status in the patient's notes. A VRE 'Alert' will be placed on the PMS database by the IP&C Service

1.7.6 Previously Positive Patients

- An effective decolonisation regime for patients with VRE is not established so it is likely that a previously positive patient will remain positive during subsequent admissions.
- There are currently no nationally or internationally agreed clearance criteria
- 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).
- On occasions the IPC Service may review a VRE case regarding ongoing requirements for Contact Precautions.

1.8 Carbapenem-resistant Enterobacteriaceae (CRE)

1.8.1 Introduction

What is a CRE?

Enterobacteriaceae is the name given to a family of bacteria that normally lives in our bowel e.g. E. coli, Klebsiella sp. Carbapenems are a group of antibiotics with a broad spectrum of activity often used for

complex infection and when other antibiotics have been found to be ineffective. Bacteria that produce a carbapenemase enzyme that confers resistance to the Carbapenem group are called Carbapenem Resistant Enterobacteriaceae (CRE).

There are different classes of CRE including the NDM, KPC, VIM and OXA groups.

These antibiotic-resistant bacteria have important infection prevention & control implications and strict transmission –based precautions must be implemented.

Source Reservoir

The gastrointestinal tract is the major reservoir of CRE

Contaminated environment and equipment (particularly faecally contaminated equipment).

1.8.2 CRE risk assessment

Assess the patient for screening using the Multidrug Resistant Organisms (MDRO) Admission Assessment Flowchart (Appendix 1).

This chart is used in conjunction with the monthly 'MDRO cross infection list' available on the IP&C Intranet site.

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

The following samples should be taken and the 'Antimicrobial Screen' box ticked on the request form:

- Anal swab with visible faecal matter or preferably a faeces sample
- Indwelling urinary catheter specimen of urine (CSU)
- Wound swab / abdominal drain sample

1.8.3 Care of the Patient with CRE

Infection prevention measures for CRE is identical to VRE.

Strict Contact Precautions and single room with dedicated toilet facilities.

For other details refer to 1.7.3 - 1.7.5 VRE section .

1.9 Other MDRO

1.9.1 Introduction

Other MDRO includes the following

- Plasmid Amp-C producing coliforms

- Other multi-drug resistant Gram-negative organisms e.g. multi-resistant Acinetobacter species

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

Source Reservoir

- The gastrointestinal tract is the major reservoir of many other MDRO's.
- Contaminated environment and equipment (particularly faecally contaminated equipment)

1.9.2 Identification of other MDRO

- Most other MDRO will be identified via routine clinical isolates and/or screening for ESBL,VRE & CRE

1.9.3 Care of the patient with other MDRO

- Refer also to CDHB IPC Policy, Transmission-Based Precautions (Isolation Guidelines)
- Single room
- Contact Precautions with own toilet facilities (if ensuite not available, allocate own commode chair in room or dedicated toilet)

Measurement/Evaluation

IPC Service monthly and annual surveillance reports

Daily ICNet review

References

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

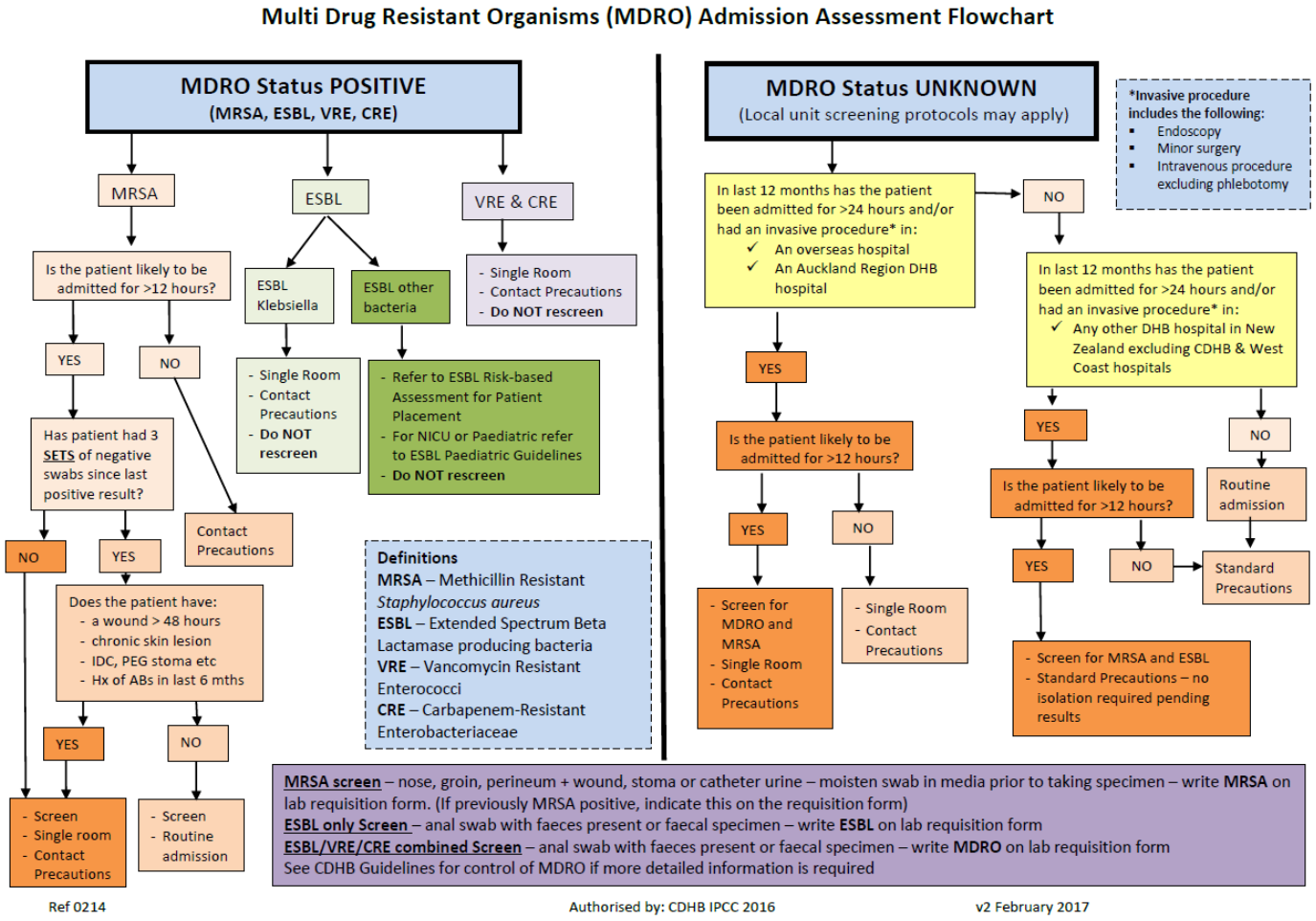
2 Guidelines for the Control of Methicillin-resistant Staphylococcus aureus in New Zealand. August 2002, Ministry of Health, Wellington

3 ESBL resistance in enteric bacteria; Strama 2007. Downloaded 30/1/12 http://en.strama.se

4 ESR Public Health Surveillance http://www.surv.esr.cri.nz/antimicrobial/esbl.php

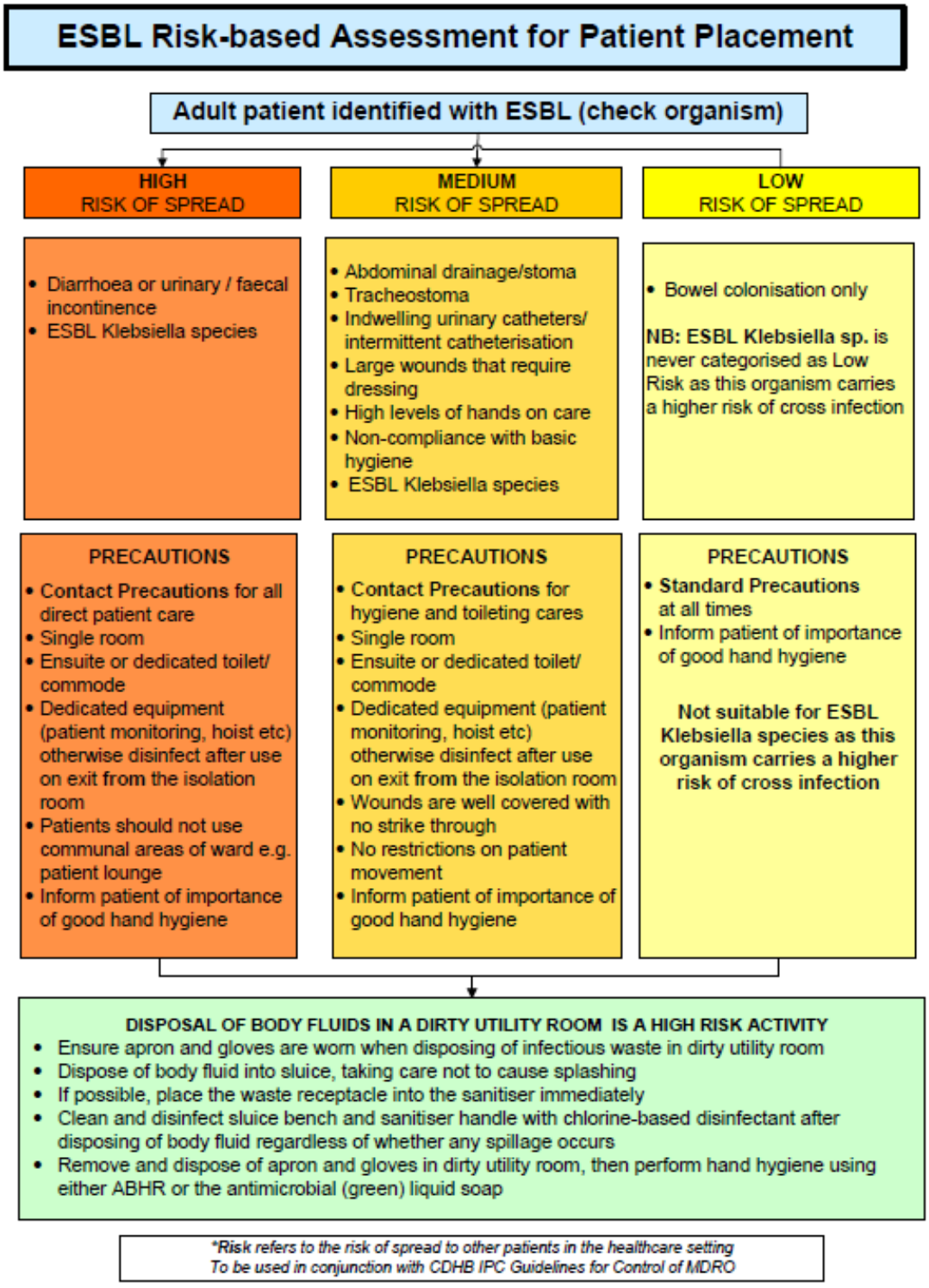
Policy Owner	CDHB Infection Prevention & Control Service
Policy Authoriser	Executive Director of Nursing
Date of Authorisation	June 2016

Appendix 1: MDRO Admission Assessment Flowchart



**The latest version of this document is available on the CDHB intranet/website only.
Printed copies may not reflect the most recent updates.**

Appendix 2: ESBL Risk-based Assessment for Patient Placement



Appendix 3: Guidelines for Use of Burwood Hydrotherapy Pool for Inpatients with ESBL Colonisation

Patients who are undertaking rehabilitation at Burwood Hospital have access to a hydrotherapy pool which is used as a tool for the physiotherapy service. There may be a risk of cross infection through the use of the pool by a person colonised or infected with ESBL.

When an inpatient colonised or infected with Extended Spectrum Beta-Lactamase (ESBL) and in Contact Precautions has been assessed as needing to use the hydrotherapy pool, the Infection Prevention & Control Service will be consulted by the Physiotherapy Service to determine if the patient meets the risk assessment criteria for using the pool. This risk assessment will be done on a case by case basis.

The following criteria shall apply to the patient:

- No current infection with ESBL
- No draining or uncovered wound
- No diarrhoea or vomiting for two weeks after last episode
- Continent of urine and faeces
- If an indwelling device is present, this needs to be spigotted and the insertion site
- covered with an occlusive or other waterproof dressing
- The patient will not use the changing or showering facility at the pool
- Patient must be encouraged to use ensuite toilet prior to visit to the pool. If the toilet at the pool is used by the patient, it will require disinfection.

The risk of cross infection with ESBL is minimised through the management of the chlorine levels in the water. This is undertaken by Maintenance and Engineering and will be arranged by the Physiotherapy Service prior to patient session:

- The free available chlorine (FAC) level of the pool needs to be tested immediately prior to the patient's session; the level of FAC must be a minimum of 2ppm
- The FAC needs to be tested immediately after the session, if less than 2ppm, the level of chlorine needs to be adjusted upward to 2ppm