Somerset Partnership NHS
NHS Foundation Trust

POLICY FOR THE CONTROL OF MULTI-RESISTANT GRAM NEGATIVE ORGANISMS (MRGNO) INCLUDING EXTENDED SPECTRUM BETA-LACTAMASE (ESBL) PRODUCING COLIFORMS, PSEUDOMONADS AND CARBAPENEMASE-PRODUCING ORGANISMS
(to be read in conjunction with all other Trust Infection Prevention and Control Policies)

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DOCUMENT CONTROL

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CONTENTS

1. INTRODUCTION

1.1 Many Gram negative organisms are either inherently resistant to certain antibiotics or acquire resistance. The purpose of this policy is to guide Trust employees in the infection control management of patients with Multi Resistant Gram Negative Organisms (MRGNO) and minimise the spread of these organisms within the Trust.

1.2 Carbapenemase-producing organisms have emerged which may be resistant to all conventional antibiotics; this is part of a trend which may lead to some infections becoming untreatable. Carbapenemase – producing coliforms are resistant to all carbapenems.

1.3 Gram negative organisms may be introduced into the gut via the faecal-oral route and establish in small numbers (colonisation).

1.4 Carbapenemase-producing organisms have emerged from health-care environments in a number of countries (Table 2) and are in the sewage in at least one; this makes community spread much more likely. They transmit via the same route as other MRGNOs and are present in the UK.

1.5 Secondary spread in health care settings can readily occur via the hands of healthcare personnel.

1.6 Correct infection prevention and control practices are essential to prevent spread and outbreaks of MRGNOs.

2. PURPOSE AND SCOPE

2.1 The purpose of this policy is to ensure all actions are taken to prevent infection from spreading and to ensure that all patients are treated appropriately.

2.2 This policy applies to all clinical staff (including Temporary, Locum, Bank, Agency, Contracted staff as appropriate)

3. DUTIES AND RESPONSIBLITIES

3.1 Infection Control Doctor (ICD) / Microbiologist

- To phone Grade A and A+ MRGNO results to the Infection Prevention and Control (IPC) team or directly to the medical practitioner / Nurse on the ward if out of hours
- To provide infection prevention and control advice out-of-hours
- To advise medical staff on treatment of MRGNO infections
- To notify the South/South west Health Protection Team of outbreaks / transmission events of Carbapenemase-producing organisms (two or more related cases)
- To alert and educate other clinicians in the Trust to the local emergency of Carbapenemase-producing organisms.

3.2 **Infection Prevention and Control Team (IP&C team)**

- To advise ward staff on infection prevention and control management of patients with known MRGNO
- To identify and investigate potential outbreaks and take appropriate action with the ward team.
- To investigate any MRGNO related bacteraemia

3.3 **Inpatient / Minor Injury Unit staff**

- To identify patients who may be/transferred whilst undergoing a screening programme, as have been identified from a high-risk country in relation to Carbapenemase-producing organisms. Staff will be required to screen on admission
- Ward staff within the community hospitals must continue screening programme as described in Appendix C
- To ensure infection prevention and control advice is followed for patients identified with MRGNO

3.4 **Medical Staff**

- To ensure infection prevention and control precautions outlined in this policy are followed
- To discuss treatment where necessary with Consultant Microbiologist

3.5 **Somerset Primary Link**

- Liaise with IPC team to ensure risk assessment has been undertaken prior to inter-healthcare transfer

4. EXPLANATIONS OF TERMS USED

4.1 **Gram-negative Organisms**- Bacteria classified according to their staining characteristics.

4.2 **Coliforms** – A type of gram negative organism. These inhabit the human intestine and may cause a variety of diseases such as UTI and gram negative septicaemia.

4.3 **Beta-Lactams –** are a group of antibiotics that include penicillins and cephalosporins.

4.4 **Beta-Lactamase**- is an enzyme produced by an organism that breaks down beta-lactams.

4.5 **Third Generation Cephalosporins** – include cefotaxime, ceftazidime and ceftriaxone.

4.6 **Carbapenems**- a group of antibiotics including meropenem, imipenem and ertapenem.

4.7 **Carbapenemase –** an enzyme, produced by an organism, which breaks down carbapenems

4.8 **Carbapenemase Producing Organism (CPO)/ Carbapenemase-producing Enterobacteriaceae** (CPE) **Carbapenem-resistant enterobacteriaceae (CRE) –** are gram-negative bacteria that are nearly resistant to the carbapenem class of antibiotics, considered the "drug of last resort" for such infections.

4.9 **Enterobacteriaceae** are common commensals and infectious agents.

4.10 **Index Case** – The first case to be identified in an outbreak of infectious disease.

4.11 **Augmented care**- an area of an acute hospital where patients receive intensive treatment. This includes ITU, HDUs, Haematology and Oncology. Patients are at increased risk of developing infections if they become colonised with MRGNOs in these areas.

4.12 **Low risk environment** – an area in the hospital where patients are at lower risk of developing disease if they acquire an MRGNO. These are areas other than augmented care.

5. DEFINITIONS

5.1 **Grading of MRGNOs** (see Appendix A)

MRGNOs are graded according to their resistance to four representative antibiotics, ceftazidime, gentamicin, ciprofloxacin and meropenem.

Grade A+ - these organisms are resistant to meropenem. Exceptions: *Pseudomonas aeruginosa* is only grade A+ if resistant to all 4 antibiotics including meropenem. *Stenotrophomonas maltophilia* is not classified A+ even if meropenem resistant.

Grade A – Organisms resistant to ceftazidime, gentamicin and ciprofloxacin.

Grade B – Organisms resistant to two of the antibiotics ceftazidime, gentamicin and ciprofloxacin.

Grade C – Organisms resistant, or intermediate, to ceftazidime only.

6. INFECTION PREVENTION AND CONTROL PRECAUTIONS

6.1 Where a patient is found to be colonised or infected with MRGNO Infection Control precautions in line with those detailed in Table 1 and those set out below should be put in place. **Please note; it is most likely that this will be identified within an Acute NHS Trust:**

6.2 Isolation

The patient should be source isolated in a single room. (Please see Table 1 and refer to Isolation Policy for details). Patients with MRGNO and diarrhoea are at a higher risk of spreading the organism and must be given priority for single rooms. An appropriate isolation sign should be placed on the door. Patients who are incontinent of urine are at a higher risk of transmitting the infection and should be nursed in isolation.

6.3 Hand Hygiene

Five moments of Hand Hygiene must be adhered to whilst patient remains in isolation.

6.4 Protective Clothing

Disposable Plastic aprons should be put on prior to entering the isolation room and removed and hand hygiene performed immediately before leaving the room. Gloves should be worn as per standard precautions (i.e. for contact with blood, body fluids or mucous membranes). Visitors do not need to wear protective clothing unless they are carrying out direct patient care (e.g. assisting in personal care).

6.5 Equipment

Wherever possible, equipment should be disposable or dedicated for the sole use of the affected patients. All reusable equipment must be thoroughly cleaned before being used on other patients and should be kept to a minimum. If using a commode this must be dedicated for the sole use of the patient, stay in the room and be cleaned in between each use.

6.6 Environmental cleaning

The isolation room must be cleaned thoroughly at least once daily, with particular attention to all horizontal and touch surfaces including bed frames, tables, lockers, sinks and door handles.

6.7 Linen

Used linen should be sealed in a pink alginate laundry bag and then placed in a plastic white laundry bag.

6.8 Discharge from Hospital

The presence of MRGNO must never affect the discharge of the patient to their home or alternative care facilities. If care facilities are refusing to take a patient because of colonisation with an MRGNO then this should be reported to the Infection Prevention and Control Team. However if the patient is for transfer to alternative care facilities then the presence of the MRGNO should be communicated to the General Practitioner and the admitting facility in the discharge summary. If the patient is for transfer to another hospital then their Infection Prevention and Control team should be informed especially regarding

patients with Grade A+, A and B organisms. Provide relevant parties with information leaflets as accessed from the Trust Intranet site

6.9 **Terminal Clean**

On discharge, a deep clean must be carried out. This must include floors, bed frame, mattress, lockers, bed, table, chair and all equipment and horizontal surfaces. Curtains must be changed or blinds cleaned. Any reusable equipment in the room must be decontaminated adequately or disposed of.

7. ANTIBIOTIC PRESCRIBING

7.1 Appropriate use of antibiotics will greatly reduce the selection pressure for colonisation and infection with MRGNOs:

- Antibiotics must be prescribed according to the Trust's Antimicrobial Guidelines or following advice from a Consultant Microbiologist/Infection Control Doctor.
- Where there is more than one case on a ward, the prescriber should consider avoiding cephalosporin use altogether in other patients on the ward.
- In an outbreak situation, the Infection Prevention and Control Team, a Consultant Medical Microbiologist and the Antimicrobial Pharmacist will suggest interim alternative antibiotic prescribing guidelines on a ward/ unit.

8. MRGNO CARRIAGE

8.1 Patients with known MRGNO carriage should be flagged on Cerner / RiO with a biohazard alert. This is to alert the medical team, so as to direct appropriate antibiotic treatment and appropriate Infection Prevention and Control precautions. As with MRSA the Biohazard alert will remain indefinitely and when patients are readmitted they should be isolated dependent on the grade.

9. SCREENING FOR CARBAPENEMASE PRODUCING ORGANISMS

9.1 Screening for CPOs will be carried out by the Acute Trusts if patients meet the criteria set out in Table 2. This will be performed by either stool specimen or rectal swabbing, Refer to Section 9. Patients requiring screening for CPOs will require isolation based on their travel history as set out in Table 2. These patients may be transferred to a community inpatient setting, mid screening.

9.2 The Acute NHS Trusts will screen contacts if a patient has been nursed on the open ward is subsequently found to be positive for a CPO (MRGNO A+). A contact is defined as a patient nursed in an immediately adjacent bed to an index patient for more than 48 hours. These patients may be transferred to a community inpatient setting, mid screening.

9.3 Screening for patients from low-risk environments (i.e. not included in table 2) and for non-Grade A+ MRGNOs is not done routinely. The Acute Trust Infection Prevention and Control Team and Consultant Microbiologist will

decide when screening is required for example during an outbreak particularly in the Acute Trust Augmented Care setting.

9.4 Screening of Health Care Workers (HCW) is not indicated. However staff should be aware that these organisms may cause UTI's in young HCWs highlighting the importance of personal hygiene following contact with patients in the clinical environment.

9.5 Patients who have received any in patient care abroad within the last 12 months should be screened. Patients should also be screened if they have been an inpatient outside of the South West of England please see Appendix C.

9.6 **Patients who require screening are normally seen in an acute hospital prior to transfer to Community Hospital environments. Therefore the first rectal screen or stool sample may have been processed. The expectation will be to continue the screening process as set out in Appendix B.**

10. HOW TO TAKE SCREENS FOR CARBAPENEMASE PRODUCING ORGANISMS

10.1 The screen will be performed by either rectal swabbing or stool samples. Rectal swabs are preferred, particularly for inpatients, as they will give more speedy results compared to waiting for a stool sample.

10.2 Taking a Rectal swab:

- Verbal consent should be obtained. If the patient declines then a stool sample should be obtained at the earliest opportunity.
- If appropriate, the patient can be instructed to take their own swab
- Use regular blue topped swab (Amies' medium)
- Moisten the end of the swab with either the gel at the bottom of the plastic tube/ or normal saline
- Gently insert the tip of the swab into the rectum 3-4cms beyond the anal sphincter, rotate gently and remove.
- There should be visible faecal material on the swab.

10.3 If the patient has any wounds these should be swabbed once at the time of admission and a urine sample should be sent if the patient is catheterised. Specimens should be clearly labelled as "Carbapenemase CPE screen" and the clinical details must include the hospital where the patient has been an inpatient.

10.4 These specimens do not need to be sent as urgent out-of-hours and will be tested the following day. The results will normally be available the day after the specimens reach the laboratory and positives will be communicated to ward staff as soon as the laboratory is aware.

10.5 Patients requiring screening for CPEs will require isolation until three screens are confirmed negative

11. TREATMENT OF MRGNO INFECTIONS

11.1 Asymptomatic patients do not require treatments, nor those with resolving and very mild symptoms.

11.2 If treatment is required, discuss with a Consultant Microbiologist or Antimicrobial Pharmacist. Treatment for any serious infection that may be due to MRGNOs should include antibiotics to which the organism is known to be susceptible.

11.3 No decolonisation protocol is available as the organisms are carried in the faeces.

12. OUTBREAKS

12.1 Is there is an outbreak of Grade B, A or A+ MRGNOs then Infection Prevention and Control team will be aware as a result of notification of cases by laboratory staff. The Infection Prevention and Control team will meet to discuss the outbreak and convene an outbreak meeting if required. The procedure in The Outbreak Policy will be followed. A decision whether to screen contacts will then be made on a case by case basis.

13. TRAINING REQUIREMENTS

13.1 The Trust will work towards all staff being appropriately trained in line with the organisation's Staff Mandatory Training Matrix All training documents referred to in this policy are accessible to staff within the Learning and Development Section of the Trust Intranet.

14. EQUALITY IMPACT ASSESSMENT

All relevant persons are required to comply with this document and must demonstrate sensitivity and competence in relation to the nine protected characteristics as defined by the Equality Act 2010. In addition, the Trust has identified Learning Disabilities as an additional tenth protected characteristic. If you, or any other groups, believe you are disadvantaged by anything contained in this document please contact the Equality and Diversity Lead who will then actively respond to the enquiry.

15. MONITORING COMPLIANCE AND EFFECTIVENESS

15.1 Process for Monitoring Compliance

Incidence and isolation practice for patients with MRGNO will be monitored by the Infection Prevention and Control team through alert organism surveillance, as detailed in the Isolation Policy.

An audit to monitor compliance with screening of patients from high risk countries will be carried out annually by the Infection Prevention and Control Doctor.

15.2 The policy will be monitored by the Infection Prevention and Control Assurance Group and assurance on compliance with this policy will be reported to the Clinical Governance Group quarterly.

16. COUNTER FRAUD

16.1 The Trust is committed to the NHS Protect Counter Fraud Policy – to reduce fraud in the NHS to a minimum, keep it at that level and put funds stolen by fraud back into patient care. Therefore, consideration has been given to the inclusion of guidance with regard to the potential for fraud and corruption to occur and what action should be taken in such circumstances during the development of this procedural document.

17. RELEVANT CARE QUALITY COMMISSION (CQC) REGISTRATION STANDARDS

17.1 Under the **Health and Social Care Act 2008 (Regulated Activities) Regulations 2014 (Part 3), the fundamental standards** which inform this procedural document, are set out in the following regulations:

Regulation 9:	Person-centred care
Regulation 10:	Dignity and respect
Regulation 11:	Need for consent
Regulation 12:	Safe care and treatment
Regulation 13:	Safeguarding service users from abuse and improper treatment
Regulation 14:	Meeting nutritional and hydration needs
Regulation 15:	Premises and equipment
Regulation 16:	Receiving and acting on complaints
Regulation 17:	Good governance
Regulation 18:	Staffing
Regulation 19:	Fit and proper persons employed
Regulation 20:	Duty of candour
Regulation 20A:	Requirement as to display of performance assessments.

17.2 Under the **CQC (Registration) Regulations 2009 (Part 4)** the requirements which inform this procedural document are set out in the following regulations:

Regulation 16:	Notification of death of service user
Regulation 17:	Notification of death or unauthorised absence of a service user who is detained or liable to be detained under the Mental Health Act 1983
Regulation 18:	Notification of other incidents

17.3 Detailed guidance on meeting the requirements can be found at http://www.cqc.org.uk/sites/default/files/20150311%20Guidance%20for%20providers%20on%20meeting%20the%20regulations%20FINAL%20FOR%20PUBLISHING.pdf

18. REFERENCES, ACKNOWLEDGEMENTS AND ASSOCIATED DOCUMENTS

References

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Investigations into multi-drug resistant ESBL producing Escherichia coli strains causing infections in England. Available via http://www.hpa.org.uk
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Y.Wiener-Well, B Rudensky and A. M Yinnon et al. Carriage rate of Carbapenem resistant *Klebsiella pneumonia* in hospitalised patients during a national survey. J Hospt Infect 2010;74 (4):344-349

Cross reference to other procedural documents

Consent to Examination and Treatment Policy

Consent and Capacity to Consent to Examination and/or Treatment Policy

Development & Management of Organisation-wide Procedural Documents Policy and Guidance

Isolation Policy

Hand Hygiene Policy

Learning Development and Mandatory Training Policy

Record Keeping and Records Management Policy

Risk Management Policy and Procedure

Outbreak Policy

Staff Mandatory Training Matrix Training Prospectus

Untoward Event Reporting Policy and procedure

All current policies and procedures are accessible in the policy section of the public website (on the home page, click on 'Policies and Procedures'). Trust Guidance is accessible to staff on the Trust Intranet.

19. APPENDICES

19.1 For the avoidance of any doubt the appendices in this policy are to constitute part of the body of this policy and shall be treated as such.

Appendix A	Summary of grading of MRGNOs and management of patients with MRGNOs
Appendix B	Summary of CPE screening requirements for the Acute Hospitals
Appendix C	Screening of Patients at Risk of Acquiring Carbapenemase Producing Enterobacteriaceace (CPE)

Appendix A

Summary of grading of MRGNOs and management of patients with MRGNOs

Grade of MRGNO	Resistant to	Isolation
A+ (CPOs)	Carbapenems (see exceptions above)	Must be isolated with own toilet facilities for duration of stay; if part of outbreak, contact screening should be commenced
A, B or C **and** patient has diarrhoea or incontinence	See below	Must be isolated with own toilet facilities/ commode whilst has diarrhoea
A	Ceftazidime and ciprofloxacin and gentamicin (i.e. all three)	Must be isolated with own toilet facilities especially if diarrhoea or urinary incontinence
B	Two of ceftazidime, ciprofloxacin, gentamicin	Should be isolated if side room available (
C	Ceftazidime	Not a high priority for isolation. Should be isolated if side room available, risk assessment to be carried out by IPC Team.

Appendix B

Summary of CPE screening requirements for the Acute Hospitals

Patient Group	Who to Screen	How to screen
Adult medical admissions, incl. ITU/HDU. Adult emergency surgical and trauma admissions	Screen those with inpatient stay in last year **outside Somerset, Exeter and Bristol**.	Three screens taken on day 0,1 and 2 of admission. Rectal swabs preferable to stool samples. Rectal swabs should not be taken on neutropenic patients.
Adult elective surgery	Screen those who have been an inpatient **abroad** in last 12 months	Stool samples x 3 within a week, or one rectal swab at POAC then two stool samples.
Paediatric	Screen those with inpatient stay in last year **outside Somerset, Exeter and Bristol**.	Stool samples x 3, not rectal swabs. Samples on day 0,1 and 2 of admission if possible.

Appendix C

Screening of Patients at risk of acquiring Carbapenemase Producing Enterobacteriaceace (CPE)