Carbapenemase-producing Enterobacterales Screening and Infection Prevention and Control Guideline

Reference no.: CG-MICRO/2023/008

1. Introduction

The purpose of these guidelines is to ensure the Trust screens the relevant patients for carriage of c*arbapenemase-producing Enterobacterales (CPE).*

2. Aim and Purpose

Adherence to the guideline will:

- Reduce the risk of cross infection and spread of CPE by following the screening guidance and taking the appropriate action on the results.
- Reduce the risk of nosocomial transmission in the healthcare setting.

Definitions, Keywords:

Carbapenemase-producing Enterobacterales (CPE).	A large family of bacteria that usually live harmlessly in the gut of humans and animals. They include bacteria such as Escherichia coli, Klebsiella spp. and Enterobacter spp. These organisms are some of the most common causes of infections, including urinary tract infections, intra-abdominal and bloodstream infections. They are organisms that spread rapidly in healthcare settings and lead to poor clinical outcomes because of limited therapeutic options.
Carbapenems	A valuable family of β-lactam (penicillin-like) antibiotics normally reserved to treat serious life-threatening multidrug-resistant Gram-negative infections in hospitals. They include meropenem, ertapenem and imipenem.
Nosocomial	Infections acquired during the process of receiving health care that was not present during the time of admission.

3. Admission Screening

On admission patients must be assessed to determine if they meet the CPE screening criteria by asking the three CPE screening questions. Screening must take place within 24 hours of admission to UHDB. A patient admitted as a day case does not require screening unless the decision to admit for an overnight stay is made.

Admission Screening Criteria

CPE Screening questions:

a) Has the patient been identified as having CPE in the past or close contact with a person who has?

b) Has the patient had an overnight stay in any hospital, in the UK (excluding UHDB) or abroad in the previous 12 months?

Note: There is no requirement to rescreen the patient for CPE on each admission to UHDB unless there have been further overnight stays in any hospital in the UK or abroad.

c) Is this patient being admitted to Intensive Care Unit (non-elective pathway), ward 301, ward 407 which are augmented care areas?

4. CPE Screening Specimens

If the CPE screening criteria is met the following CPE screening specimens should be sent to microbiology:

- Rectal swab with visible faecal material and/or discolouration to enable organism detection in the laboratory. Take by gently inserting a swab inside the rectum 3 to 4cms beyond the anal sphincter, rotating gently and removing. Normal saline can be used to moisten the swab prior to insertion.
- Or stool sample collect a pea sized amount of stool in a blue stool sample container.

In addition, if any of the following are present a swab / sample should be collected:

- Wounds swabs - surgical wounds, leg ulcers, pressure sores, breaks in skin, other lesions.
- Urine sample if patient catheterised.

N.B. Unless it is a 'wet' site, swabs should be moistened prior to taking the swab using the transport medium.

Use a standard charcoal transport swab and/or universal container. Ensure all swabs are correctly labelled and sent to the laboratory with a completed microbiology request form with all relevant clinical information completed. A negative result will be available 48 - 72 hours.

If an infection is suspected, samples from infected sites should be sent for microscopy, culture & sensitivity as well as a CPE screen. Include all relevant clinical information on the request.

If a patient is CPE negative on screening - no further screening is required unless there are 'other' infection control concerns.

5. Screening Contacts

If a patient is CPE positive on screening or from a routine clinical sample, screening of close contacts is required.

A contact patient is described as patients who have been in direct (for example person to

person contact) or indirect contact (for example contact with contaminated environment or equipment) or shared the same clinical space (for example bay or less commonly ward) with another patient who is infected or colonised with CPE.

The number of contacts to be screened will be determined by Infection Prevention & Control Team (IPCT) / consultant microbiologist on a case-by-case basis based on proximity to the index case, duration of exposure, and shared staff.

6. CPE Outbreak screening strategy

When CPE positive patients are found among screened contacts, the strategy for further screening of patients' needs to be expanded. IPCT/consultant microbiologist will commence and coordinate an enhanced period of screening via an outbreak management meeting.

The programme of screening for outbreaks is likely to reflect the below:

- patients in the affected unit, bay or ward should be screened twice a week for 2 weeks, and weekly for a further 2 weeks.
- Once no new cases are detected the frequency of screening may be reduced and stopped following a period of between 4 and 8 weeks
- IPCT will flag discharges for readmission screening on Lorenzo and Meditech.
- Patient's potential exposure to CPE should be included on any inter hospital or intra hospital transfer communication and discharge summary to alert relevant healthcare providers (including GPs)

7. Infection Prevention and Control Precautions

7.1 Hand hygiene

Hand hygiene with alcohol hand sanitiser or soap and water must be performed before and after every patient contact, removal of PPE and after contact with the patient's equipment and environment. All staff must be bare below the elbows in clinical areas.

Isolation whilst awaiting CPE screening result

It is best practice for any patient with a risk factor for CPE to be isolated whilst awaiting CPE screening results. However, patients with a history of CPE or have had an overnight stay in a hospital abroad within the last year would take priority for a side room.

Isolate immediately in a single room with ensuite facilities (or dedicated WC or commode) until screening results are available. If it is not possible to isolate in a single room, then nurse with strict emphasis on maintaining compliance with contact precautions at the bedside and optimal environmental cleaning following discussion with IPCT.

The following factors increase the risk of CPE transmission and should be considered when prioritising side rooms. Patients with diarrhoea, incontinence (urine &/or faeces), discharging wounds, medical devices in situ, ventilatory support requirements, high risk of wandering and poor hygiene.

For routine screening in augmented care areas (ward 407, 301, ICU) continue with standard IPC precautions unless CPE risk factors have been identified.

If a patient is CPE negative on screening - no further screening is required, and precautions can discontinue unless there are 'other' infection control concerns.

If a patient is CPE positive on screening or from a routine clinical sample. The number of contacts to be screened will be determined by IPCT/consultant microbiologist on a case-by-case basis based on proximity to the index case, duration of exposure, and shared facilities.
CPE Outbreak screening strategy. When CPE positive patients are found among screened contacts, IPCT will commence an enhanced period of screening. The specific screening strategy will be agreed by IPCT.

7.2 Isolation and personal protective equipment

CPE positive Patients on screening or from a routine clinical sample

Transmission based Personal Protective Equipment (PPE) **Contact precautions** or **Enteric Isolation Precautions (if diarrhoea)**

Clean and remove all unnecessary equipment from the bay(s), side room or bedspace and ensure the relevant PPE is available. Place a contact or enteric isolation precaution door card outside the side room, affected bed space or bay(s). Allocate dedicated equipment, ideally per patient. Use dedicated single-patient or single-use equipment, for example blood pressure cuffs, pulse oximeters or thermometers. Clean shared equipment between patients.

Keep patient lockers and tables clean and clutter free. Clean the environment and equipment with a chlorine releasing agent. Treat all linen and waste as infectious.

- Single room with ensuite toilet facilities, dedicated commode, or allocated toilet
- When a single room is not available, or the patient is not safe to isolate; use contact or enteric precautions in a multi-occupancy bay and inform the IPC team. These patients must have an allocated toilet or dedicated commode. Draw privacy curtains (if appropriate for patient safety) between adjacent beds to minimise opportunities for close contact between patients.
- Isolate with contact precautions unless the patient has diarrhoea when enteric precautions must be instigated.
- Disposable gloves and apron must be worn if there is a risk of exposure to blood or body fluids and they must be single use and changed between patients and / or after completing a procedure/task even on the same patient.
- Consider long sleeve gowns (LSG) if there is risk of gross contamination of uniform.
- Face protection is recommended if there is risk of splashes of blood or bodily fluids.
- Document the date that IPC precautions commenced and the reason. Inform the patient and relatives about the need for isolation/cohort nursing and the precautions staff will be taking.

Using a local risk assessment to prioritise single rooms based on those presenting an increased risk of secondary transmission, such as patients who have diarrhoea, or are

incontinent, have wounds with uncontrolled drainage, or are colonised in their respiratory tract and who are coughing and considering the patient's level of care.

Cohort Isolation - patients with the same carbapenemase enzyme and organism can be cohorted within one ward (or defined area of a ward). IPCT will advise.

Patients must not be prevented from undergoing clinical investigations or procedures because of CPE. Care of patients must not be compromised by them being in isolation.

7.3 Periods of increased incidence and outbreaks.

Closed bays or wards - this means no admissions, transfers, or discharges to another ward/healthcare facility. The only exception is for extreme medical need such as transfer to a critical or speciality care area for clinical need. Discuss transfers on an individual basis with the speciality consultant or registrar and IPC. Isolate on transfer. Patient's clinical condition and need for diagnostic investigations, procedures or treatment must always take precedent. Ensure departments and visiting staff are aware of the PPE and cleaning requirements. Inform the receiving department of the required precautions. Where possible areas where patients undergo diagnostics and/or procedures should place CPE positive patients at the end of the day's list to allow for thorough cleaning and decontamination of the environment.

7.4 Patients discharges.

Patients discharges. CPE carriers should be clearly identified on patient records or electronic systems (case flagging). Patient's GP should also be informed about their colonisation or infection status. This information should be included on any interhospital transfer, future admission to another hospital and discharges to community hospitals, care homes or with care packages.

7.5 Environmental cleaning.

For CPE an enhanced environmental clean with chlorine, hydrogen peroxide vapour (HPV) and curtains changed is required. Environmental decontamination is critical following the transfer, discharge, or death of a colonised or infected patient and requires coordination between cleaning services, ward/department staff and the IPCT. Scrupulous cleaning and disinfection of all surfaces is required with particular attention to frequent hand touch surfaces. A CPE isolation room must not be used for another patient unless cleaning and hydrogen peroxide decontamination has taken place, rooms are to be blocked overnight until this has taken place.

- Mattresses covers, bedframes, handrails must be cleaned then disinfected, and the integrity of the cover assessed; if the mattress cover is damaged, the mattress must be condemned.
- Pillows should be disposed of if the integrity of the cover is damaged or the pillow itself is soiled.
- Privacy curtains should be removed and laundered.
- All used or unused single-use items and consumables in the patient's immediate vicinity (that may have become contaminated by hand contact) should be discarded, keeping limited stocks near the patient reduces the need for this.

- Lavatory brushes and their holder should be disposed of as part of the discharge or terminal clean.

Guidance for Patients and Carers

Patients must be provided with the opportunity to clean their hands (soap and water, hand sanitiser or hand wipes) after using the toilet, respiratory hygiene, vomiting, touching contaminated objects, before eating.

Encourage 'respiratory hygiene' and 'cough etiquette' by asking patients to cover their nose and mouth with disposable tissues when sneezing, coughing, wiping, and blowing nose.

Visitors - who are not providing any patient care and who are not visiting other patients in the hospital do not need to wear gloves or an apron or gown. If visitors are taking an active part in the patient's care, SICP should be used. Visitors should not use patient toilet facilities. Ask visitors to follow hospital visiting advice including hand hygiene. Ask them not to visit the hospital if they are unwell.

Provide information to patients and relatives.

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10. References

For further information please refer to the NATIONAL INFECTION PREVENTION AND CONTROL MANUAL FOR ENGLAND: https://derby.koha-ptfs.co.uk/cgi-bin/koha/opac-detail.pl?biblionumber=4091

For further information see the full framework document: Actions to contain carbapenemase-producing Enterobacterales (publishing.service.gov.uk)

Appendix 1: CPE Admission Screening Criteria

See supporting document in Koha
https://derby.koha-ptfs.co.uk/cgi-bin/koha/opac-detail.pl?biblionumber=4154

Appendix 2: Acute Care CPE Flow Chart

See supporting document in Koha
https://derby.koha-ptfs.co.uk/cgi-bin/koha/opac-detail.pl?biblionumber=4154

Appendix 3: Containing CPE in a paediatric setting

Used nappies

These should not be taken out of the room – if weighing is required, weigh in the room. If this is not possible, they should be taken out in a nappy sack or container, by a member of the unit staff (not the parent or carer) to the sluice room and weighed, then disposed of. Cleaning of the scales plus any surfaces that the nappy, or staff member has been in contact with should then be undertaken.

Breast pumps

It is preferable for a mother to use her own pump. This can stay in the room with the mother, the expressing kit will need decontaminating, this should be carried out by a HCW if coming out of the room. If the mother does not have her own pump, a dedicated breast pump is preferable to be used for her for the length of the baby's admission.

Management of expressed milk

Bottles should be cleaned by a HCW prior to storage in a communal fridge. Feeding bottles and equipment are disposed of in the room. Follow the local procedure for cleaning and decontamination of expressed kits, ensuring that surfaces are not left contaminated.

The mother and baby's clothing should be taken home to launder and the family given advice on washing clothes at a high temperature.

The family should be able to use communal areas with advice on maintaining hand hygiene after handling nappies and care of the baby.

If the baby has or develops loose or diarrhoea stool or has a stoma

If the family are involved with nappy care or with this aspect of care, then they should wear an apron to protect their clothing from contamination to prevent possible spread to communal areas. They should be reminded of the importance of hand hygiene to reduce cross transmission.

Education and follow up

The family and visitors must be educated in hand hygiene, fridge management; equipment management, as necessary and follow up to ensure compliance.

Toys and play

Toys should be dedicated for the child with CPE for the duration of their stay. Those that are not cleanable should either go home with the child or be discarded.

11. Documentation Control

Reference Number CG-MICRO/2023/008	**Version:** 1		**Status** Final		
Version / Amendment History	Version	Date	Author	Reason	
	1	August 2021	Helen Forrest Head of Infection Prevention & Control	Guideline developed for CPE screening using the National framework document not covered in other policies.	
	2	May 2023	Justine Halliwell Deputy Head of Infection Prevention & Control		
Intended Recipients: All medical and nursing staff. Matrons. Divisional Nurse Directors. Clinical Directors. Divisional Medical Directors					
Training and Dissemination: Dissemination via the Trust Intranet. Two yearly infection prevention and control update training. Face to face ward and department based training					
Development of Guideline: Justine Halliwell **Job Title:** Deputy Head of Infection Prevention & Control					
Consultation with: Division and Business Units. Microbiology Infection Control Operational Group: Infection Control Group					
Linked Documents: National Infection Prevention and Control Manual for England - Trust					

Policy; Trust Policy For Infection Prevention & Control; Trust Policy For Outbreak Management; Cleaning - Trust Policy and Procedure	
Keywords: Carbapenemase-producing Enterobacterales (CPE)	
Business Unit Sign Off	**Group:** Infection Control Operational Group **Date:** May 2023
Divisional Sign Off	**Group:** Infection Prevention & Control Group **Date:** May 2023
Date of Upload	07/07/2023
Review Date	July 2026, earlier if national guidance is updated
Contact for Review	Justine Halliwell Deputy Head of Infection Prevention & Control