Carbapenemase Producing Enterobacteriaceae (CPE)

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Status: Approval date: March 2016
Ratified by: Control of Infection Control Committee
Review date: 2017
Executive summary

In the last few years the UK has seen a rapid increase in the incidence of colonisation and infection by multi-resistant organisms such as Carbapenemase Producing Enterobacteriaceae (CPE).

Owing to the emerging threat and risk posed to the organisation and to both patients and staff, this policy sets out the new CPE screening protocol as per Department of Health; Acute Trust Toolkit for the Early Detection, Management and Control of CPE:

This policy has been ratified in accordance to Trust policy.
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2. Scope
3. Purpose
4. Management of Patients with CPE
5. Screening/Isolation
6. Infection Control Precautions
7. Communication
8. Antibiotic Treatment for CPE Positive Patients
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Other Associated Documents/Policies

- Multi-Resistant Gram Negative Bacilli Policy (CPE Policy)
- Isolation Policy
- Outbreak Management Policy
- Admission, Transfer & Discharge Policy for the Infected Patient
- Operational guidelines
1. Introduction

Enterobacteriaceae are a large quantity of bacteria that usually live harmlessly in the gut of all humans, but can cause opportunistic infections such as UTIs, hospital acquired pneumonia and bloodstream infections. They are Gram negative organisms and they include E. coli, Klebsiella spp. and Enterobacter spp. Some of these organisms have become resistant to antibiotics by producing enzymes that inactivate even broad spectrum antibiotics such as meropenem.


This policy is being written in line with the Toolkit, which provides practical advice for staff to identify high risk patients and manage them appropriately to minimise infection and transmission. CPE is becoming prevalent in many countries, including the UK – Appendix 2 provides a current list of countries and regions with high prevalence. A number of clusters and outbreaks have been reported in the UK, especially in Manchester and London and this poses an increasing threat to our patients.

In the last few years the UK has seen a rapid increase in the incidence of colonisation and infection by multi-resistant organisms such as CPEs.

2. Scope

This guidance is relevant to all staff who have patient contact or work within patient areas.

3. Purpose

The purpose of this policy is to ensure ALL staff have an understanding of CPE, know how to identify and manage patients who are colonised with the organism and ensure prioritisation of isolation rooms is given to confirmed/suspected cases or those who fall into the high risk category as defined by the DH CPE Toolkit.

4. Management of patients with CPE

Early identification and isolation of suspected or confirmed cases is crucial to prevent outbreaks. Immediate isolation of patients repatriated from any other UK hospital or patients who in the previous 12 months have been an inpatient in the UK or abroad, is essential (see CPE patient admission flowchart – Appendix 3).

5. Screening/Isolation

All suspected cases must be screened on admission and 3 negative swabs are required before a patient can be deemed negative and moved out of isolation. Screening should be undertaken 48 hours apart.

It is the responsibility of the staff member admitting patients or at pre-assessment to undertake a risk assessment and ask the following questions:

- Have you ever been diagnosed with CPE?
- Have you been an inpatient in a hospital abroad in the last 12 months?
- Have you been an inpatient in a UK hospital other than ASPH in the last 12 months?
Screening consists of a rectal swab or a stool specimen (please do not delay obtaining a screen by waiting for a stool specimen). For haematology patients or those with a haematological malignancy (e.g. leukaemia, lymphoma, multiple myeloma) please send a stool specimen, not a rectal swab.

**Isolation Room Priority**

It is recognised that CPE screening will impact on the utilisation of isolation rooms available to other patient groups such as:

- End of life care
- Those with infection due to other organisms.

It is recognised that there are insufficient isolation rooms available, in particular for specialities such as vascular and cardiac. Where possible, suspected cases should be admitted into an isolation room on the most appropriate speciality or ward. If there is a need to outlier, the appropriate speciality team must be notified.

The Clinical Site Nurse Practitioners (CSNPs) will ensure that all repatriated patients are admitted straight into an isolation room. Due to insufficient isolation facilities, the following order of priority for the use of isolation rooms must be followed (also see Appendix 3):

**High Importance (must always be isolated)**

Pulmonary TB (smear positive infectious period)
Carbapenemase Producing Enterobacteriaceae (CPE)
Clostridium difficile (C. diff) or GDH Positive (until diarrhoea resolved and formed stool passed) symptom free
Chickenpox (Varicella) during the infectious stage
Diarrhoea and Vomiting
Meningococcal Meningitis or meningococcaemia (1st 24 hours)
Vancomycin Resistant Enterococcus (VRE) (patients with diarrhoea or VRE)

**Medium Importance (if available or seek advice from Infection Control)**

MRSA (sputum, heavy skin shedding)
ESBLs (e.g. Klebsiella, E. coli, producing Extended-Spectrum Beta-lactamases) or Amp C Beta-lactamase-producers
Shingles (herpes zoster) during the infectious period

Where it is appropriate, end of life care patients can be nursed in a side room, however, in the event that there is a deficit in isolation room capacity, any of the above infections will take priority.

**Vascular Repats**

**Heron Ward:**

Heron ward only has two isolation rooms and the admission of patients from other hospitals will heavily impact on the side room use and management of other infections.

**Cardiac Repats**

**Birch Acute Coronary Unit (BACU):**
BACU only has two isolation rooms with one of them being a ring-fenced bed for emergency cardiac patients. The ring fenced isolation room will continue to be used for emergency cardiac patients, however the other isolation room will be used to prioritise cardiac transfers from other hospitals.

**Inhealth Services:**
Must prioritise repatriation of patients back to Epsom.

**Orthopaedic Repats**

**Swan Ward:**
Swan ward isolation rooms should be prioritised for repats from other hospitals coming in for specialist orthopaedic surgery. Swan has 6 isolation rooms, therefore the ward has capacity to cope with the demand.

**Other areas:**

There are occasions when patients from other specialities such as renal and liver are repatriated from other hospitals. These patients, where possible, should be admitted into an isolation room on the most appropriate speciality ward. If there is a need to outlie, the appropriate speciality team must be notified and where possible patients should be outlied according to the Buddy Ward system.

6. **Infection Control Precautions**

**Infection Control Measures**

Use of Standard Precautions and especially adherence to hand hygiene policies is the cornerstone for preventing transmission of multi drug resistant organisms such as CPE. Colonisation and/or infection of patients with multi drug resistant organisms may be unknown and it is therefore of paramount importance that healthcare workers adhere strictly to basic hand hygiene policies during patient care to prevent cross-infection.

Stringent infection control practices are emphasised as being particularly important when using and caring for devices/equipment such as:

- intravenous/peripheral lines
- central venous catheter lines
- urinary catheters
- wound management
- enteral feeding equipment
- colostomy or ileostomy
- any re-usable medical equipment

Dedicated/single-patient or single-use equipment is preferable

NOTE: Loose stools or diarrhoea (for any reason) increase the risk of spread of these bacteria from the gut.

**CPE Isolation**
Confirmed cases - must remain isolated with infection control precautions for the duration of their hospital stay and on all subsequent re-admissions.

Suspected cases – in the absence of any other infectious risks, can come out of isolation following 3 negative swabs.

7. Communication

All confirmed cases are flagged up on Patient Centre. It is the Infection Control Nurse’s responsibility to flag up any new cases.

The Director of Infection Prevention and Control (DIPC) will send out a letter to the patient’s GP informing them of the finding of CPE and patients are given a laminated CPE alert card to use when attending any healthcare setting, and to be retained by the patient.

8. Antibiotic Treatment for CPE Positive Patients

Discuss with the Consultant Medical Microbiologist.

9. Personal Protective Equipment

Gloves and aprons should be worn by all staff undertaking patient care. Gloves and aprons are single patient and single procedure items. These should be removed directly after the patient episode (apron first, then gloves) and disposed of into the clinical waste bin. This must be followed by washing your hands with soap and water.

10. Cleaning of the Patient Environment and Equipment

The management of the environment and equipment is vital in minimising the spread of CPE. CPEs can be eliminated from the environment through strict adherence to high standards of cleaning and decontamination.

It is the Ward Manager’s/Clinical Nurse Lead’s responsibility to ensure staff understand the levels of cleaning and frequencies.

Daily enhanced cleaning of the room should be undertaken using Tristel Fusion.

Stringent decontamination of equipment is of extreme importance especially after use on colonised/infected patients. Dedicated/single use equipment is the preferred option.

On discharge of a confirmed case, ward staff are to contact Housekeeping department for a terminal clean. Ensure all nursing equipment, including bed linen, has been removed. All equipment used must be cleaned over with the universal wipes followed by a Clorox wipe (5,200ppm chlorine) or in accordance with manufacturer’s instructions.

In the event of an outbreak or an increase in exposure such as prolonged inpatient stay of CPE confirmed case, the Infection Control Team, together with the Housekeeping Manager, will arrange and hire the service of a reputable company to decontaminate the room using hydrogen peroxide.
11. **Clinical Waste and Linen**

- Waste should be disposed of into an orange clinical waste bag
- Used linen should be placed in a red alginate bag and then placed in an outer white plastic bag
- Change bed linen daily
- Do not sit on beds

12. **Patient’s responsibility during their stay**

The patients, where possible:

- must be actively encouraged to keep their bed space clutter free to enable cleaning of a high standard to be undertaken
- must be actively encouraged to observe (or assisted with) good hand hygiene particularly following use of toilet/commode

Patients and all staff should feel free to challenge poor hand hygiene practices. Report any concerns, including cleanliness of the environment, to the Ward Manager.

13. **Visitors**

Visitors must adhere to the following guidance:

- Visitors must wash/sanitise their hands on entering the clinical area/room and immediately prior to leaving
- The nurse in charge should be consulted prior to entering the isolation area/room
- Visitors do not need to wear gloves and apron for social contact
- Visitors must not sit on patients’ beds

14. **Transfer To Other Healthcare Facilities**

The transferring of CPE patients to other wards/departments should be minimised to reduce the risk of spread, but this should not compromise clinical care or rehabilitation.

Staff transferring patients to another ward/department or healthcare facility must:

- Inform the receiving area of the patient’s CPE status
- Complete the appropriate transfer documentation informing of the patient status
- The receiving area has the appropriate level of isolation nursing available if appropriate
- Portering staff who are transferring patients do not need to wear gloves. However, they must decontaminate their hands before and after the transfer.
- Wheelchairs and trolleys must be cleaned after use with Universal/Clorox wipes.

15. **Visits to Outpatients and Specialist Departments**

The receiving department must be informed of the patient’s CPE status so that infection control measures for that department can be implemented. These include:

- Patients attending the outpatients department do not need to be seen first or last.
• Standard precautions should be undertaken in clinics and decontamination of hands between all patient contacts must be undertaken.

• Whenever possible CPE positive patients must be seen at the end of the working session for specialist departments, e.g. Radiology, Physiotherapy

• Patients must be seen as soon as possible.

• Staff giving direct hands on care must wear disposable aprons and gloves.

16. **CPE in the Operating Theatre**

• CPE positive patients should be scheduled for surgery at the end of the theatre session.

• Cover affected lesions that are not involved in the surgical procedure with an impermeable dressing.

• In general follow the recommendations for antibiotic prophylaxis in the Antibiotic Guidelines, but since CPEs are so resistant other prophylactic antibiotic(s) may be indicated. Consult the consultant microbiologist before the operation.

• CPE positive patients must be recovered in the theatre. If this is not possible, recover in a segregated area in Recovery and nurse with strict standard precautions.

• At the end of the operating session the table, anaesthetic equipment and other equipment must be cleaned using detergent and water, dried and wiped with 1,000ppm chlorine (Haz-Tab) or use Chlor-Clean solution.

17. **Patient Discharge**

CPE patients should be discharged promptly from hospital when their clinical condition allows. The General Practitioner and other healthcare agencies involved in the patient’s care must be informed.

CPE carriers will not normally require special treatment after discharge from hospital. If a treatment course needs to be completed, ensure the community services are aware. Ensure the patient understands the requirements of their continued care.

If a patient is discharged to a residential care facility the medical/nursing staff must be informed. CPE colonisation is NOT a contraindication to the transfer of a patient to a nursing or residential home. CPE is not a reason for the care home to refuse the patient admission. If there are problems about this, contact Public Health England on 0845 8942944.

18. **Ambulance Transportation**

CPE carriers may be transported with other patients in the same ambulance without any special precautions, other than changing the bedding used by the carrier.

The ambulance service should be notified in advance by the ward staff.

There is no evidence that ambulance staff or their families are put at risk by transporting patients with CPE.

To minimise the risk of cross-infection with any infectious agent, ambulance staff should use an alcohol hand sanitiser after contact with all patients as part of standard precautions.
If further measures are required in special circumstances, the Infection Control Team will inform the ambulance service.

19. **Deceased Patients**

The infection control precautions for handling deceased patients are the same as those used in life. Any lesions should be covered with an impermeable dressing. A plastic body bag is NOT required unless the patient suffered from another condition requiring one or there is severe leakage of body fluids.

20. **Staff Screening**

According to the Department Of Health, screening of staff or household members for carriage is NOT routinely recommended as it is unlikely to provide additional benefit to control measures, whereas promotion of strict standard precautions will.


This Infection Control Team will inform South East Public Health England (PHE) (Surrey and Sussex local office on 0344 225 3861 option 1 as recommended by the Department of Health.

22. **Dissemination and Implementation**

This policy has been written by the Infection Control Team, agreed by the Control of Infection Committee and ratified by the Clinical Governance Committee. The policy will be available on TrustNet.

23. **Process for Monitoring Compliance with the Effectiveness of Policies**

All suspected or confirmed CPE cases are followed up daily by the Infection Control Nurses.

24. **Equality Impact Assessment**

The Trust has a statutory duty to carry out an Equality Impact Assessment (EIA) and an overarching assessment has been undertaken for all infection control policies.

25. **Archiving Arrangements**

This is a Trust-wide document and archiving arrangements are managed by the Quality Department which can be contacted to request master/archived copies.

26. **References**

**Appendix 1**

**CPE Toolkit**


| Section 7 Control of Infection | Current Version is held on the Intranet | First ratified: March 2016 | Review date: March 2017 | Issue 1 | Page 12 of 15 |
### APPENDIX 2

List of countries and regions with high prevalence of CPE

<table>
<thead>
<tr>
<th>Bangladesh</th>
<th>North Africa (all)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Balkans</td>
<td>Malta</td>
</tr>
<tr>
<td>China</td>
<td>Middle East (all)</td>
</tr>
<tr>
<td>Cyprus</td>
<td>Pakistan</td>
</tr>
<tr>
<td>Greece</td>
<td>South East Asia</td>
</tr>
<tr>
<td>India</td>
<td>South/Central America</td>
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<tr>
<td>Ireland</td>
<td>Turkey</td>
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<tr>
<td>Israel</td>
<td>Taiwan</td>
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<tr>
<td>Italy</td>
<td>USA</td>
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<tr>
<td>Japan</td>
<td></td>
</tr>
</tbody>
</table>

This is not an exhaustive list; admission to any hospital abroad should be considered when making a risk assessment. Lack of data from a country not included in this list may reflect lack of reporting/detection rather than lack of a carbapenemase problem (which may additionally contribute to an under-estimation of its prevalence).

### UK regions/areas where problems have been noted in some hospitals:

- **North West especially:**
  - Manchester

- London

**IMPORTANT:** Healthcare providers have a “duty of care” to proactively communicate any problems they are experiencing with carbapenemase-producing Enterobacteriaceae, not only with colleagues in healthcare settings which are co-terminus, but with any organisation they deal with on the patient pathway, either routinely or sporadically.

1Based on reported prevalence, correct as known (19 November 2013). Please refer to [www.phe.org.uk](http://www.phe.org.uk) for update.
APPENDIX 3
CARBAPENEMASE PRODUCING ENTEROBACTERIACEAE (CPE)
Patient Admission Flow Chart
Have you ever been diagnosed with CPE?
Have you been an inpatient in a hospital abroad in the last 12 months
Have you been an inpatient in a UK hospital in the last 12 months other than ASPH?
If you have answered “YES” to any of the above questions:

Day 0 (day of admission) Isolate patient and take rectal swab or stool specimen.
Ask for CPE screen

Positive Result
Instigate CPE management toolkit under Infection Control Team guidance.

Negative Result
Patient must remain in isolation until a further TWO samples prove negative.

Day 2 send second rectal swab or stool specimen.
Ask for CPE screen

Negative Result

Day 4 send third rectal swab or stool specimen.
Ask for CPE screen

Negative Result

Patient can come out of isolation unless isolation is needed for another reason.

Please note previous positive patients with subsequent negative results can revert to a positive state. Do NOT move patients out of isolation unless it is discussed with the Infection Control Team.
Appendix 4
Risk Assessment Chart for the admission of patients in regards to Healthcare Associated Infection (HCAI)

**DOES THE PATIENT HAVE AN INFECTION?**
Is there a recent history of HCAI e.g. MRSA, VRE, ESBL, CPE, C diff?
Any history of recent communicable disease e.g. chickenpox, measles, shingles, TB?
Any recent history of diarrhoea and/or vomiting?
Has the patient been hospitalised abroad?

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**Prioritisation of Single Rooms for Infectious Patients**

<table>
<thead>
<tr>
<th>Infection</th>
<th>Priority</th>
<th>Isolation/cohort requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulmonary TB</td>
<td>1</td>
<td>Essential</td>
</tr>
<tr>
<td>CPE</td>
<td>1</td>
<td>Essential</td>
</tr>
<tr>
<td>Chickenpox (Varicella)</td>
<td>1</td>
<td>Essential</td>
</tr>
<tr>
<td>Clostridium difficile diarrhoea/GDH positive</td>
<td>1</td>
<td>Essential</td>
</tr>
<tr>
<td>Diarrhoea &amp; Vomiting</td>
<td>1</td>
<td>Essential</td>
</tr>
<tr>
<td>Meningococcal meningitis</td>
<td>1</td>
<td>Essential</td>
</tr>
<tr>
<td>MRSA (sputum, heavy skin shedding)</td>
<td>2</td>
<td>Essential in high risk areas</td>
</tr>
<tr>
<td>ESBL</td>
<td>2</td>
<td>Preferable</td>
</tr>
<tr>
<td>Shingles (Herpes zoster)</td>
<td>3</td>
<td>Preferable</td>
</tr>
</tbody>
</table>

Any infectious patient placed in a single room must have the appropriate signage placed in the plastic cover outside the room.

If you have any queries please contact: The Infection Control Team on Ext 2128/2544 or out of hours on-call Consultant Microbiologist for further advice. Also refer to the Ward Resource Pack for further guidance in regards to diarrhoea & vomiting.