Lincolnshire Community Health Services
NHS Trust

Guidance on the Infection Prevention and Control Management of Carbapenemase Producing Enterobacteriaceae (CPE)

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Lincolnshire Community Health Services NHS Trust

Carbapenemase Producing Enterobacteriaceae guideline

Version Control Sheet

Version	Section/Para/ Appendix	Version/Description of Amendments	Date	Author/Amended by
1	New document	Version One	June 2014	Infection Prevention Team (adapted from ULHT guideline)
2 V 2	References	Added toolkit reference	July 2016	L Roberts
3 V2	Added 1.7, 2.4, 3.3 and 5.2.1	Added non Acute Community Settings	July 2016	L Roberts
4 V2	Added 7.3.	Factors that increase risk of spread	July 2016	L Roberts
5 V2	Added 8	Flowchart re management	July 2016	L Roberts
6 V2	Added 9	Section regarding inpatient settings	July 2016	L Roberts
7V3	Whole document	Changed footers and headers	June 2018	S Fixter
8V3	Appendix 3	Removed leaflet	June 2018	S Fixter
9V3	Appendix 4	Telephone numbers changed and changed to appendix 3	June 2018	S Fixter
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Lincolnshire Community Health Services NHS Trust

Carbapenemase Producing Enterobacteriaceae Guideline

Contents

Lincolnshire Community Health Services NHS Trust

Carbapenemase Producing Enterobacteriaceae guideline

Background	The purpose of this guidance is to implement a co-ordinated approach to Carbapenemase Producing Enterobacteriaceae within Lincolnshire Community Health Services in line with current Department of Health requirements.
Statement	This guideline is comprehensive, formally approved and ratified, and disseminated through approved channels. It will be implemented for Lincolnshire Community Health Services.
Responsibilities	Compliance with this guideline will be the responsibility of the relevant Lincolnshire Community Health Services staff.
Training	The Infection Prevention Team will support/deliver any training associated with this policy.
Dissemination	Via Website/intranet
Resource implication	This guideline has been developed in line with the NHS Litigation Authority guidelines to provide a framework for staff within NHS Organisations to ensure the appropriate production, management and review of organisation-wide guidelines.

Abbreviations/definitions

CPE	Carbapenemase Producing Enterobacteriaceae
DIPC	Director of Infection Prevention and Control
IPT	Infection Prevention Team
PHE	Public Health England
Bacteraemia	Presence of bacteria in the blood, detected in blood culture
Colonisation	Asymptomatic presence of a micro-organism, also termed carriage.

1. Introduction

1.1. Bacteria from the family Enterobacteriaceae live harmlessly in the gut, but can cause significant infections when they get into the wrong place. It is a very large family of Gram negative bacteria, including *Escherichia coli, Klebsiella pneumoniae*, and *Enterobacter cloacae*. They can cause a broad range of infections from uncomplicated urinary tract infections, through to overwhelming sepsis.

1.2. Enterobacteriaceae can become resistant to antibiotics through many different mechanisms. One of these is production of various beta-lactamases which destroy some beta-lactam antibiotics e.g. Benzylpenicillin, Cefotaxime, Imipenem, Aztreonam before they can kill the bacteria.

1.3. Carbapenemases are beta-lactamases which break down carbapenem antibiotics, such as Meropenem, Imipenem and Ertapenem. Carbapenemases are of major public health concern because carbapenem antibiotics represent almost the last class of antibiotics available to treat infections caused by multi-resistant Gram negative bacteria.

1.4. In the UK, in recent years, we have seen a rapid increase in the incidence of infection and colonisation by multi-drug resistant carbapenemase-producing organisms. A number of clusters and outbreaks have been reported in England, some of which have been contained, providing evidence that, when the appropriate control measures are implemented, these clusters and outbreaks can be managed effectively."

1.5. Infections caused by carbapenemase producing Enterobacteriaceae (CPE) are associated with high mortality (40-70% in bacteraemia patients) because the antibiotic agents available to treat them are less effective than the antibiotics that we would usually use against sensitive bacteria and there is likely to be a delay in appropriate antibiotic treatment.

1.6. CPE can colonise the gut asymptomatically. In that case, the patient has "carrier" status. These patients are still subject to the strict infection prevention and control precautions outlined in this document.

1.7. Patients in non-acute and community settings e.g. immunocompromised and those receiving complex care with frequent acute admissions are vulnerable and are at risk of exposure and acquiring a CPE.

2. Purpose

2.1. Worldwide an increasing number of CPEs are being recognised, and there have been a small number of significant outbreaks within hospitals in the UK, but cases have also been identified in the wider community.

2.2. Public Health England (PHE) and the Department of Health have issued patient safety alerts and guidance on recognition and management of these bacteria.

2.3. Unless we act now, learning from experiences elsewhere across the globe, rapid spread of carbapenemase-resistant bacteria has great potential to pose an increasing threat to public health and modern medicine in the UK."

2.4. This guideline represents the local healthcare community response to the challenge of CPE in non- acute and community settings, e.g. Inpatients in community beds and those with complex needs in the community e.g. immediate care settings, community rehabilitation and hospices.

3. Objectives

3.1. Outline the screening protocol for CPE.

3.2. Guide ward staff about infection prevention and control precautions to be taken for at risk patients.

3.3. Outline the action to be taken in the event of identification of CPE in both non- acute inpatients in the community hospitals and community settings

4. Scope

4.1. These guidelines are to be used by all staff and applied to all patients treated by LCHS, in particular those at risk or known to be carrying CPE.

4.2. Although designed for CPE, these guidelines are also applicable for the control of other carbapenemase producing organisms, for example carbapenemase-producing *Pseudomonas aeruginosa*.

5. Responsibilities

5.1. Non-Acute In patient settings e.g. Community wards

5.1.1 The admitting nurse, in conjunction with the medical staff, must assess the risk of CPE carriage and screen patients as per the protocol. The risk assessment must then be recorded in the SystmOne records.

5.1.2 The infection prevention team must advise and assist ward staff after identification of a patient at increased risk or found to be a carrier of CPE.

5.2. COMMUNITY

Non-Acute In patient settings e.g. Community wards

5.2.1 The nurse in conjunction with the GP, must assess the risk of CPE carriage and screen patients as per the protocol. The risk assessment must then be recorded in the SystmOne records.

5.2.2 The infection prevention team must advise and assist ward staff after identification of a patient at increased risk or found to be a carrier of CPE.

5.3. If the patient is in the inpatient setting, the DIPC must alert the trust board in the event of identification of CPE and support the action taken to prevent and control spread.

6. Associated documentation

Related documentation can be found in the infection control section of the website, including guidance on isolation of patients, standard precautions, hand hygiene and the guidance on management of an outbreak.

7. Identification of patients at risk

7.1. As part of the routine admissions process, all patients must be assessed for risk of carbapenemase carrier status. All patients at risk must be screened.

7.2. Patients at risk include those who have been:

7.2.1. Treated in a hospital outside the UK, including dialysis abroad, within the last 2 years

7.2.2. Treated in a UK hospital known to have had problems with the spread of CPE eg hospitals in the North West of England especially Manchester within the last 2 years

7.2.3. Treated in hospitals in London within the last 2 years

7.2.4. Identified as previously carrying CPE

7.2.5. Close contact with a carrier. A “close contact” includes household contact, someone sharing the same sleeping space (e.g. hospital bay), or a sexual partner.

7.3 Factors that increase risk of spread - information for managers and carers

The individual:-

- lives in a shared care environment where individuals are congregated and are cared for in close proximity to one another
- and their family have not yet received information on how to best manage the infection and prevent the spread of bacteria
- has a discharging wound or oozing from an infected area
- has diarrhoea or smears or protests with faeces
- is confused or has dementia
- requires physical rehabilitation or assistance with washing, dressing, going to the bathroom/using a commode or bedpan

Lack of compliance with:-

- NICE standard principles of prevention and control of healthcare associated infection in primary and community care; a summary included in Section C1
- environmental cleaning and communications with staff and clients

8. Flow chart for the infection Prevention and control management of individuals positive for Carbapenemase-producing Enterobacteriaceae (colonisation or infection)

Guidance for undertaking a risk assessment on managing individuals with a positive laboratory result for Carbapenemase-producing Enterobacteriaceae

This information is designed as a guide only, and is not exhaustive advice for all settings or care needs. If the individual's care needs are not shown and you are unable to find an applicable scenario based on the examples presented, please contact your local IP&C team or PHE centre for further advice.

At all risk levels ensure the following:
• **standard precautions are maintained at all times (Section C1)**
• **effective environmental hygiene (Annex F):** prevention of faecal and environmental contamination is crucial; remain alert to episodes that risk direct transmission to others and/or environmental contamination; ensure timely and thorough cleaning
• **hygiene advice to individual and family/contacts (Annex B-D)**: it is important to inform individuals and those around them to ensure they take appropriate personal hygiene measures to prevent the spread of infection, especially when using the toilet

Risk assessments must include consideration of the care environment, e.g. nursing care setting, specialist or general rehabilitation, haemodialysis unit, EMI, dementia care unit, community hospital or hospice, mental health trust, residential care, domiciliary care or detention centre/prison.

If the individual is colonised: single room with en-suite facilities including toilet or designated commode is recommended; no curtailment of communal activities is required where standard precautions and effective environmental hygiene are being maintained and there is no risk of infecting others.

If the individual is infected: conduct a risk assessment with usual IP&C advisor and/or PHE centre to discuss possible isolation (with defined end-of-isolation criteria; section A3.1); consider the mental and physical health and wellbeing of the individual when deciding to isolate.

Always communicate the positive status of an individual appropriately when transferring the individual between care settings (Annex A).

<table>
<tr><th colspan="2">CARE NEEDS</th><th>GUIDANCE for RISK ASSESSMENT</th></tr>
<tr><td>High Risk</td><td>E.g. patient has: diarrhoea, discharging wound, long term ventilation, confusion/dementia, device(s) in situ, undergoing invasive procedures, smearing or ‘dirty protests’</td><td>• identify if there is an immediate risk of infecting others
• discuss management with GP/clinician in charge, IP&C nurse
• consider the mental and physical health and wellbeing of the individual
• consider if the individual requires supervision
• consider options to facilitate terminal cleaning and disinfection and minimise the risk of spread of infection where possible by:
• giving individuals an end of list appointment
• using mobile equipment away from others</td></tr>
<tr><td>Medium Risk</td><td>E.g. patient requires: assistance with hygiene, mobility or physical rehabilitation</td><td rowspan="2">• no immediate risk of infecting others identified
• standard precautions are maintained (Section C1)
• hygiene advice is provided to individual and family/contacts as appropriate (Annex B-D)
• effective environmental hygiene (Annex F)
• if unsure, contact your usual IP&C advisor or PHE Centre</td></tr>
<tr><td>Low Risk</td><td>E.g. patient is independent and self-caring</td></tr>
</table>

9. Patients are a high risk of CPE in inpatients setting

- Patients are a high risk of CPE must be nursed in strict isolation.

  Precautions include single room with the door closed. Ideally en-suite, but

if not, own toilet/commode which can be accessed without walking past other patients.

- Cohort nursing may be needed, but **only on the advice of the IPT** or consultant microbiologist.
- The patients must not be permitted to walk around other clinical environments, nor have contact with other patients.
- Strict hand hygiene for all visitors before and after visiting. Minimise number of visitors. People other than the patient eating in the room must be avoided.
- Daily clean with a disinfectant and terminal clean on discharge to minimise the spread of infection
- Using patient specific equipment
- End of list appointments

See chart above Section 8

10. Patients are a high risk of CPE in inpatients setting and in the community settings

11. Patients of a medium and low risk of CPE in an inpatient setting and the community settings

See chart above in Section 8

12. Screening for CPE

- Screen ideally within 24hours of admission.
- A rectal swab or stool sample may be sent. Rectal swabs should be avoided if the patient is neutropenic. Otherwise rectal swabs are preferred by the laboratory. There should be visible faecal material on the swab. Caution if patient has a stoma.
- Swabs from skin breaches and device exit sites should also be submitted.
- Label the swab “carbapenemase screening” and send to the microbiology laboratory. Store in specimen fridge if transport is delayed.

- The microbiology laboratory has a protocol in place for the detection and reporting of carbapenemase producing enterobacteriaceae.
- If any samples test positive, treat the patient as positive.
- Any patient who has been previously positive should be treated as positive now regardless of the screening result.
- See the flowchart and Risk Prioritisation Matrix detailed at Appendix 1 & 2 for further details.

13. Action on identification of a case via screening or clinical sampling

- Isolation of patients at risk of CPE or lab confirmed cases of CPE colonisation/infection. A patient with an infection should not be removed from isolation.
- Source isolation of the patient **must be achieved**.
- Screen patient contacts if patient has been in an open ward or bay.
- Enhance environmental cleaning (chorine releasing agents e.g. Actichlor or Chlor-clean)
- Communicate with the patient and relevant staff – immediate communication with IPT and the clinical team is essential (see appendix 3 for patient leaflet)
- Review clinical management of the patient especially devices and antibiotics, or review need.
- Any antibiotic treatment including surgical prophylaxis must be discussed with a consultant microbiologist.
- If diagnostic samples are sent to the microbiology laboratory include “known CPE” in the clinical details.
- There is not an effective decolonisation regimen available, and decolonisation should not be attempted.

14. Isolation

- Source isolation as outlined above must be maintained for the duration of this and subsequent hospital admissions.
- Use of hand wash must be encouraged.
- Disposable aprons and gloves must be used by visitors when assisting with care. Hand hygiene must still be encouraged.
- Gloves and single use long sleeved gowns are to be worn by staff. Masks are not necessary.
- Minimise equipment which should be dedicated to patient for the duration of their stay. Decontaminate thoroughly with a disinfectant wipe, e.g. Clinell Sporicidal wipes before use on future patients.
- Any large pieces of equipment (e.g. portable ultrasound machines) must be discussed with the IPT before they are taken into the patient area.
- All linen must be bagged in infected linen bags/sacks prior to removal from room.
- Waste should be disposed of in the infectious waste stream
- Ideally nursing staff should not treat other patients during the same shift. It is recognised that this may not be practical where there is only one patient carrying CPE on a ward. Other staff e.g. AHPs and doctors should avoid seeing the patient until the end of the shift when it is safe to do so. Non-essential staff must avoid contact with the patient. (E.g. medical students, volunteers).

15. Contact screening

- Consider convening an outbreak control team meeting as per outbreak guidelines.
- Identify and screen contacts. These are any patients who have shared an open ward area or bay with a non-isolated case. In discussion with PHE consider screening of all patients in the whole ward area, especially if the identified carrier is not suspected to be the index case.
- Datix. Complete a Datix report.

- Weekly and discharge screening should be undertaken of patient contacts on affected units/wards for a period of 4 weeks after the last case was detected.

16. Enhanced environmental cleaning

- Room should be cleaned at least daily with a chlorine releasing agent.
- Deep cleaning of the whole ward should be undertaken on discharge of a CPE carrier.

17. Communication

Following identification of a patient carrying CPE, the following must be informed:

- Inform the patient about their carrier/infection status (See appendix 3 for patient leaflet).
- CPE Alert Cards to be circulated to staff to promote adherence to local policy (See appendix 3).
- Provide the patient with an information leaflet for the patient to show to other hospitals and healthcare providers regarding CPE carrier status.
- Internal colleagues

  Flag the notes and set SystmOne alert
  IP team
  Consultant microbiologist
  Ward staff
  Facilities/NHS Property Services
  Trust executive via DIPC

- External colleagues

  Microbiologists and IPCT in neighbouring trusts if there is traffic of patients between trusts

- Key partners

  Public Health England
  Local commissioning groups

18. Action to be taken on detection of an outbreak

- If a PII is identified, the outbreak guideline should be followed.
- Rapid isolation and urgent screening of all contacts should be undertaken. The microbiology laboratory must be alerted so that arrangements can be made for additional screening capacity.
- Staff screening is not recommended unless on the advice of a consultant microbiologist and occupational health department.
- PIR should be undertaken
- Reporting any outbreak as a Datix/STEIS should be considered.

19. Action on negative screen result

- If the screening test is negative and the patient has not a previous personal history of CPE carriage, a risk assessment can be carried out and if appropriate isolation precautions can be stopped.
- Previously known positives whose recent screens are negative can revert to a positive state especially following a course of antibiotics and so must remain in isolation for the duration of their stay.

20. Discharge from hospital

- Patients found to be positive should be considered to be carriers lifelong, since there is no specific eradication therapy, and negative samples are unreliable following previous positives.
- A patient carrying a carbapenemase producing organism must be discharged with good communication to the GP, staff of care institution, and the relevant IPT (community or healthcare associated). Failure to communicate positive CPE status is a serious incident which must be reported and investigated. Inter-healthcare transfer form must be used.
- Public Health England should be involved early in discharge planning to ensure that the nursing/residential home is supported.
- There is no reason for non-acute settings to refuse admission/readmission provided that they have been given good supporting information and advice.

- Ambulance / transport service must be informed and advised to refer to their own policies relating to transfer of patients with CPE carriage and an inter-healthcare Infection Control transfer form.

- **Monitoring**

Minimum requirement to be monitored	**Process for monitoring e.g. audit**	**Responsible individuals/ group/ committee**	**Frequency of monitoring/ audit**	**Responsible individuals/ group/ committee (multidisciplinary) for review of results**	**Responsible individuals/ group/ committee for development of action plan**	**Responsible individuals/ group/ committee for monitoring of action plan**
Compliance	Audit	Ward Managers/ IP	Annually	IP Committee	IP Committee	IP Committee

Equality Analysis

Name of Policy/Procedure/Function*
Carbapenemase producing Enterobacteriaceae

Equality Analysis Carried out by: S Fixter
Date: 25/06/2018
Equality & Human rights Lead: Rachael Higgins
Date: 25/06/2018

Medical Director: Dr Yvonne Owen
Date: 25/06/2018

***In this template the term policy\service is used as shorthand for what needs to be analysed. Policy\Service needs to be understood broadly to embrace the full range of policies, practices, activities and decisions: essentially everything we do, whether it is formally written down or whether it is informal custom and practice. This includes existing policies and any new policies under development.**

A.	Briefly give an outline of the key objectives of the policy; what it's intended outcome is and who the intended beneficiaries are expected to be	Carbapenemase producing Enterobacteriaceae		
B.	Does the policy have an impact on patients, carers or staff, or the wider community that we have links with? **Please give details**	The document is relevant to staff employed by LCHS NHS Trust		
C.	Is there is any evidence that the policy\service relates to an area with known inequalities? **Please give details**	None		
D.	Will/Does the implementation of the policy\service result in different impacts for protected characteristics?	No		
		Yes	No	
	Disability		√	
	Sexual Orientation		√	
	Sex		√	
	Gender Reassignment		√	
	Race		√	
	Marriage/Civil Partnership		√	
	Maternity/Pregnancy		√	
	Age		√	
	Religion or Belief		√	
	Carers		√	
	If you have answered 'Yes' to any of the questions then you are required to carry out a full Equality Analysis which should be approved by the Equality and Human Rights Lead – please go to section 2			
The above named policy has been considered and does not require a full equality analysis				
Equality Analysis Carried out by:	Sarah Fixter			
Date:	25/06/2018			

Bibliography:

Acute trust toolkit for the early detection, management and control of carbapenemase-producing Enterobacteriaceae. Public Health England December 2013.
http://www.hpa.org.uk/Publications/InfectiousDiseases/AntimicrobialAndHealthcareAssociatedInfections/1312Toolkitforcarbapenementero/

UK standards for Microbiology Investigations: Laboratory detection and reporting of bacteria with Carbapenemase-hydrolysing beta-lactamases (Carbapenemase). Standards Unit, Microbiology Services Division, HPA. March 2013.
http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317138520481

NHSE patient safety alert: Addressing rising trends and outbreaks in carbapenemase producing enterobacteriaceae. March 2014.
http://www.england.nhs.uk/wp-content/uploads/2014/03/psa-carbapenemase.pdf

Policy adopted from ULHT Guidance May 2014.

References:

Public Health England. Toolkit for managing Carbapenemase-producing Enterobacteriaceae in non-acute and community settings. June 2015

Appendices:

Examples of patient information, transfer documentation and outbreak documentation can be found in the PHE toolkit, and has not been replicated here.

http://www.hpa.org.uk/Publications/InfectiousDiseases/AntimicrobialAndHealthcareAssociatedInfections/1312Toolkitforcarbapenementero/

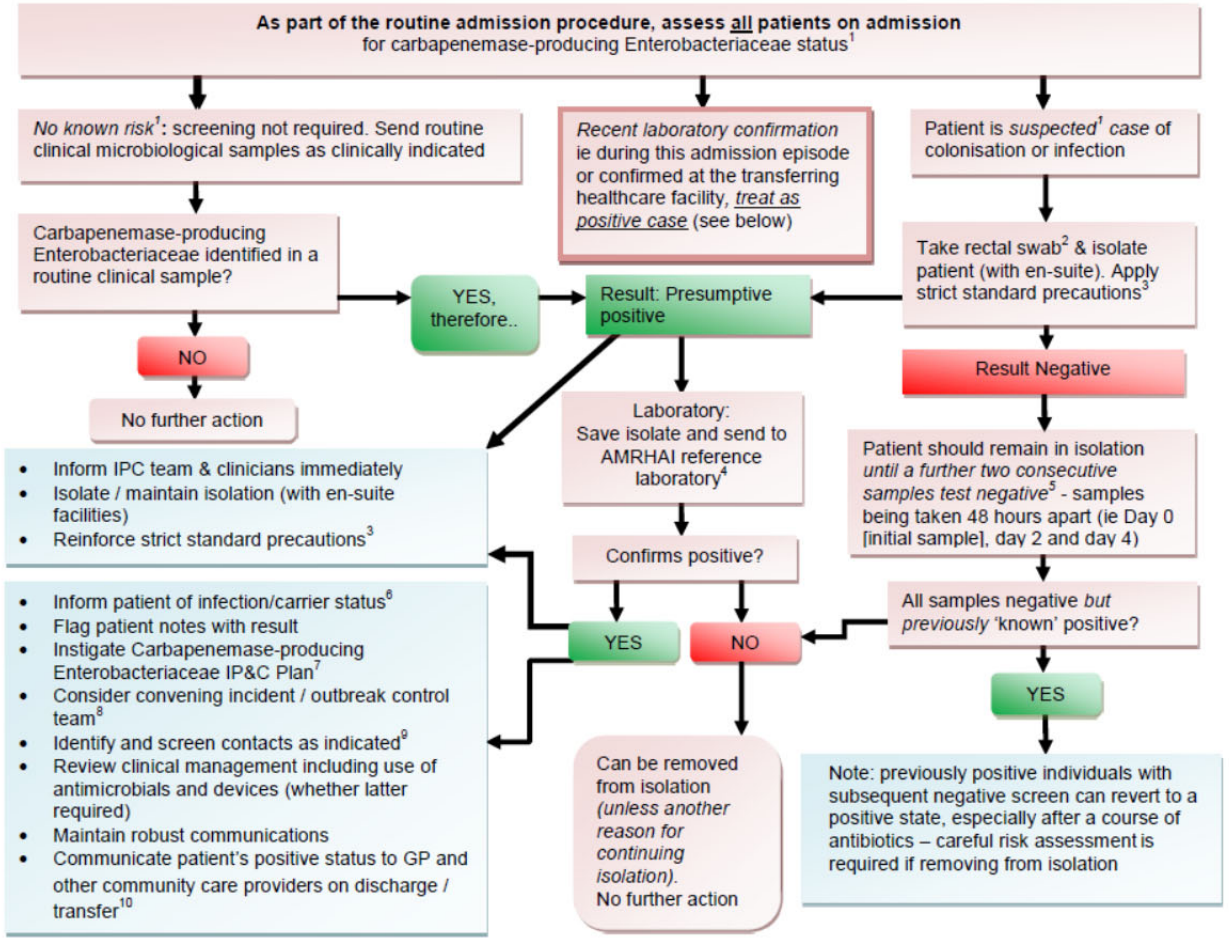
Appendix 1: Flowchart

Appendix 2: Risk Prioritisation Matrix

Appendix 3: CPE Alert card

Appendix 1: Flow Chart

A.1 Acute trust – patient admission flow chart for infection prevention and control (IP&C) of carbapenemase-producing Enterobacteriaceae



1. A suspected case is defined as a patient who, in the last 12 months, has been (a) an inpatient in a hospital abroad or (b) an inpatient in a UK hospital which has problems with spread of carbapenemase - producing Enterobacteriaceae (if known) or (c) is a 'previously' positive case (see 1.5 and Card A.2)

2. There should be visible faecal material on the swab. Alternative is stool sample (see Card A.4)

3. See Cards A.5, A.6 and A.7 for IP&C measures

4. Except if it is a repeat isolate of same species with same antibiogram (see SOP reference Card B.1)

5. Should any sample test positive, treat as positive

6. See Section C for patient information leaflets

7. Refer to template (see Card B.1)

8. See Card B.3 for outbreak checklist

9. Screen any current inpatient contacts who shared an open ward / bay with non-isolated case (see Card A.4)

10. See Card B.4 for Inter-healthcare transfer form

Appendix 2: Risk Prioritisation Matrix

ADDRESSING CARBAPENEMASE-PRODUCING ENTEROBACTERIACEAE – RISK PRIORITISATION OF INFECTION PREVENTION AND CONTROL (IP&C) MEASURES, SCREENING AND ISOLATION – ROLL-OUT PLAN (see note, page 2).

For use in conjunction with the Acute trust toolkit for the early detection, management and control of carbapenemase–producing Enterobacteriaceae[1]

THE PATIENT HISTORY →		Known or recently confirmed case of carbapenemase-producing Enterobacteriaceae[2]	Direct medical transfer from or specialist / augmented care[3] in last 12 months in country or UK care setting with *known high prevalence*[1]	Medical tourist[4] from country with *known high prevalence*[1]	History of hospitalisation in last 12 months in country or UK care setting with *known high prevalence*[1]	Identified as contact of positive case (colonisation or infection)	Medical transfer from / history of hospitalisation in last 12 months in country *with no reported problems*	No risk factors identified on admission
THE CARE ENVIRONMENT ↓		HIGH			MEDIUM		LOW	
Admission to or receiving care in specialist / augmented care unit[3]	HIGH							
Admission to or receiving care in acute general ward	MEDIUM							
Day care	MEDIUM	**	**	**	**	**		N/A
Outpatient clinic	LOW	**	**	**			N/A	N/A

[1] Refer to Acute Trust toolkit for the early detection, management and control of carbapenemase – producing Enterobacteriaceae found at: http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317140378646

[2] Screening not required for known or recently confirmed cases

[3] Examples of specialist / augmented care unit: intensive care, haematology, renal, liver, transplant, oncology, neonatal

[4] A medical tourist 'elects to travel across international borders to receive some form of medical treatment. This treatment may span the full range of medical services, but most commonly includes dental care, cosmetic surgery, elective surgery, and fertility treatment'. OECD 2010 (http://www.oecd.org/els/health-systems/48723982.pdf)

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Appendix 3: CPE Alert card

Please print and laminate before giving to the patient.