

The management of patients with Carbapenemase-producing Enterobacteriaceae in non-acute and community settings

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DOCUMENT CONTROL SHEET

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EQUALITY AND DIVERSITY IMPACT ASSESSMENT

Impact Assessments must be conducted for:

- All ECCH policies, procedures, protocols and guidelines (clinical and non-clinical)
- Service developments
- Estates and facilities developments

Name of Policy / Procedure / Service	The management of patients with Carbapenemase-producing Enterobacteriaceae in non-acute and community settings
Manager Leading the Assessment	Teresa Lewis
Date of Assessment	December 2015

STAGE ONE – INITIAL ASSESSMENT

<p>Q1. Is this a new or existing policy / procedure / service? New</p>
<p>Q2. Who is the policy / procedure / service aimed at? Patients Yes Staff Yes</p>
<p>Q3. Could the policy / procedure / service affect different groups (age, disability, gender, race, ethnic origin, religion or belief, sexual orientation) adversely? No</p> <p>If the answer to this question is NO please sign the form as the assessment is complete, if YES, proceed to Stage Two.</p>

Analysis and Decision-Making

Using all of the information recorded above, please show below those groups for whom an adverse impact has been identified.

Adverse Impact Identified?

Age	No
Disability	No
Gender	No
Race/Ethnic Origin	No
Religion/Belief	No
Sexual Orientation	No

- Can this adverse impact be justified?
- Can the policy/procedure be changed to remove the adverse impact?

If your assessment is likely to have an adverse impact, is there an alternative way of achieving the organisation's aim, objective or outcome

What changes, if any, need to be made in order to minimise unjustifiable adverse impact?
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1. INTRODUCTION

- 1.1 Enterobacteriaceae are a large family of bacteria that usually live harmlessly in the gut of all humans and animals. However, these organisms are also some of the most common causes of opportunistic urinary tract infections, intra-abdominal and bloodstream infections. They include species such as *Escherichia coli*, *Klebsiella* spp. and *Enterobacter* spp. Carbapenems are a valuable family of antibiotics normally reserved for serious infections caused by drug-resistant Gram-negative bacteria (including Enterobacteriaceae). They include meropenem, ertapenem, imipenem and doripenem. Carbapenemases are enzymes that destroy carbapenem antibiotics, conferring resistance. They are made by a small but growing number of Enterobacteriaceae strains. There are different types of carbapenemase, of which KPC, OXA-48, NDM and VIM enzymes are currently the most common.
- 1.2 This policy has been written to provide advice on the management of colonisation or infection due to carbapenemase-producing Enterobacteriaceae, to prevent or reduce their spread into (and within) health and residential care settings. There has been a rapid increase in the incidence of infection and colonisation by multi-drug resistant carbapenemase-producing organisms over the past decade. 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.
- 1.3 Carbapenem antibiotics are a powerful group of β -lactam (penicillin-like) antibiotics used in hospitals. Until now, they have been the antibiotics that doctors could always rely upon (when other antibiotics failed) to treat infections caused by Gram-negative bacteria. Urgent action is required, learning from experiences elsewhere across the globe, to tackle the rapid spread of carbapenem-resistant bacteria which has great potential to pose an increasing threat to public health and modern medicine as we know it in the UK.
- 1.4 Countries and regions with reported high prevalence of healthcare-associated carbapenemase-producing Enterobacteriaceae

Bangladesh	North Africa (all)
The Balkans	Malta
China	Middle East (all)
Cyprus	Pakistan
Greece	South East Asia
India	South/Central America
Ireland	Turkey
Israel	Taiwan

Italy	USA
Japan	
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	

- 1.5 Doctors rely on carbapenem antibiotics to successfully treat certain complicated infections when other antibiotics have failed. The spread of these resistant bacteria can cause problems to vulnerable patients in hospitals or other settings, because there are so few antibiotics available to treat the infections they cause.
- 1.6 If a person is a carrier, they do not need to be treated. If the resistant bacteria cause an infection then treatment, including antibiotics, will be required. These infections are difficult to treat due to their resistance to carbapenem antibiotics.
- 1.7 Individuals who have these bacteria living in their gut can contaminate their hands when they go to the lavatory. Because of this, there is a risk that the bacteria can contaminate and survive in the environment and potentially spread to other people, particularly when standards of hand hygiene and environmental cleanliness are poor. The bacteria can also be passed on by the hands of carers to others through touch.
- 1.8 Individuals who have been an inpatient in a UK hospital known to have had problems with spread of carbapenemase-producing Enterobacteriaceae or those who have been an inpatient in a hospital abroad are at higher risk of acquiring carbapenemase-producing Enterobacteriaceae. Appendices contain information leaflets which can be provided to individuals receiving care, their contacts and families of colonised individuals.
- 1.9 Most people will be unaware that they are a carrier and, in general, the chance of developing an infection from the bacteria is low. However, immunocompromised individuals and those receiving complex care in the community with frequent hospital admissions, will be more vulnerable. These individuals are at greater risk of colonisation and of suffering more serious consequences should they develop an infection. Colonised individuals with indwelling devices *in situ* may be at greater risk of developing an infection.

While the level of risk for infected or colonised individuals is lower than that in acute settings, if the levels of hygiene in the care setting are inadequate, resistant bacteria may spread among individuals who congregate together e.g. in a community hospital ward or care home. This may increase the risk of the spread of infection within the care setting.

2. PURPOSE

To enable staff working for East Coast Community Healthcare (ECCH) to understand the principles of precautions to be observed when caring for patients colonised or infected with carbapenemase-producing enterobacteriaceae (CPEs)

3. SCOPE

All staff either employed or contracted by ECCH who work in clinical areas with children or adults. These staff may work within ECCH premises, patients' own homes, or care settings owned by other agencies.

4. DEFINITIONS

Carbapenemase - Enzymes (such as *Klebsiella pneumoniae* Carbapenemase (KPC), OXA-48 Carbapenemase, New Delhi Metallo-beta Carbapenemase (NDM) and Verona integron-encoded metallo- β -lactamase (VIM)) produced by some bacteria which cause destruction of the Carbapenem antibiotics, e.g. Meropenem, thus resulting in resistance.

Close contact - Equivalent to a household contact (8 hours), i.e. a person living in the same house; sharing the same sleeping space (room or hospital multi occupancy bay); or sexual partner.

Colonisation - The presence of micro-organisms living harmlessly on the skin or within the bowel and causing no signs or symptoms of infection.

Community-acquired infection (CAI) - An infection that is not related to a healthcare intervention in a hospital.

Confirmed case - A patient with final laboratory confirmation of CPE infection/ colonisation from the national reference laboratory.

Co-terminous - having the same border or covering the same area.

Healthcare-associated infection (HAI) - An infection that occurs following or during a healthcare intervention undertaken either in the community (including the patient's home) or in a healthcare setting.

Infection - The presence of micro-organisms in the body causing adverse signs or symptoms.

Medical Tourism – A medical tourist “elects to travel across international borders to receive some form of medical treatment”. Most commonly includes dental care, cosmetic surgery, elective surgery and fertility treatment, though it may span the full range of medical treatment.’ OECD (2010)

Preliminary case – A patient with an initial laboratory confirmation of CPE infection/ colonisation. These samples are then sent to a reference laboratory for full confirmation.

Rectal swab – A rectal swab is a specimen taken by gently inserting a plain swab inside the rectum 3-4cms beyond the anal sphincter, rotating gently and removing. Normal saline can be used to moisten the swab prior to insertion. The swab must have visible faecal material to enable organism detection in the laboratory. (PHE 2020) criteria different **

Suspected case - A patient who has, in the last 12 months:

- a) Been previously identified as CPE positive
OR
- b) Been an inpatient in any hospital, in the UK or abroad
OR
- c) Had multiple hospital treatments eg are dialysis dependent
OR
- d) Had known epidemiological link to a known carrier of CPE
OR
- e) They are admitted into augmented care or high-risk units eg immunosuppressed, critical care, burns units

5. RESPONSIBILITIES

It is the responsibility of all staff to ensure that they adhere to best practice

6. POLICY STATEMENT

It is the responsibility of all department heads/professional leads to ensure that the staff they manage adhere to this policy

7. PROCEDURE

7.1 Early recognition of individuals who may be colonised/have an infection

A risk assessment must be used as part of the routine admission procedure to identify suspected cases of colonisation or infection with CPE.

N.B. Patients transferred to ECCH care from Acute hospitals should have had this assessment carried out on their admission to those hospital and the result documented in their notes.

Assess each patient at pre-assessment, admission and transfer/repatriation taking a thorough history and asking the following key questions:

Has the patient, in the last 12 months?

- a) Been previously identified as CPE positive
OR
- b) Been an inpatient in any hospital, in the UK or abroad
OR
- c) Had multiple hospital treatments e.g., are dialysis dependent
OR
- d) Had known epidemiological link to a known carrier of CPE
OR
- e) They are admitted into augmented care or high-risk units e.g., immunosuppressed, critical care, burns units

*Check Weblce for an electronic alert as any patients with a positive CPE result previously known to James Paget University Hospital or the Microbiology laboratory should have an electronic alert in place.

If the patient answers **no** to all four questions above, document this in the patient care record or pre-assessment paperwork and manage as per standard protocols.

If the patient answers **yes to any** of the four questions above, manage as a potential case of CPE and follow each stage of this guideline whilst screening is undertaken

7.2 Early isolation of suspected and laboratory-confirmed cases

If the patient has already had a laboratory-confirmed infection or colonisation with CPE **or** meets the criteria for a suspected case then:

- Advise the patient (and relatives if appropriate) that they meet the criteria for screening due to the risk of CPE and your management plan for their care – provide a patient information leaflet (Appendix).
- Immediately place the patient into a single room (with en-suite facilities if possible). If a single room is not available for a screened or known CPE positive patient a risk assessment should be undertaken by the IPC and clinical teams to determine where to care for patients.
- Apply the principles of policy for management of ward/departmental outbreak in all settings with dedicated equipment.
- The following factors will increase the transmission risks and need to be considered carefully:

Diarrhoea	Discharging wounds	Medical devices in situ
Incontinence of (faeces or urine)	High risk of wandering /unable to comply with IPC requirements	Tracheostomy and associated airway management Coughing or Colonised in Respiratory Tract

7.3 Prompt sampling to detect CPE

When screening samples are required for patients at risk of CPE, they should be collected on admission. Ongoing screening is indicated in the updated PHE framework (Oct 2021) for those patients in high risk units or screening related to an outbreak. Outside of the acute care sector, screening strategies should be based on local epidemiology, patient acuity and level of interventions, such as long-term ventilation and rehabilitation facilities.

What samples to take:

- Take a rectal swab using a plain swab after securing informed consent.
- A rectal swab is the best sample type to achieve speedy results; to ensure detection of the organism there must be visible faecal material on the swab and then placed in the swab casing.
- A rectal swab may be contraindicated for patients with haematological conditions and those at risk of bleeding; discuss with the doctor to confirm appropriate sampling method.

Or

- Collect a stool sample (ensure any delay in collection is clearly documented in the patient care record).

AND (using separate charcoal swabs)

- Swab skin lesions and wounds.
 - In-dwelling devices e.g. PEG site (excluding peripheral cannulae and long term intra vascular devices e.g. Hickman line unless there are clinical signs of infection).
- Request a 'CPE Screen' on Weblce under the microbiology tab. List the sample site and patient risk factors in the global clinical details section of the request.

7.4 Results of CPE screening/clinical samples

Clinical teams are responsible for checking and acting on laboratory results. Clinicians are also responsible for informing the patient of their screening results.

If the result is **NEGATIVE**, a risk assessment should be undertaken before removing from isolation (ensuring other potential infections have been excluded).

If the patient is **POSITIVE** on screening/clinical samples for CPE a preliminary report will be released initially pending formal confirmation from the national reference laboratory. The patient should be informed, offered a patient leaflet (Appendix A) and managed as per section 7.6 for the duration of their inpatient stay.

7.5 Communication

Effective communication is crucial to ensure that the risks of transmission and clinical infection are minimised.

- Patients must be informed of the screening process (leaflet available) and notified of their results (whether CPE is detected or not)
- CPE results to be included in nursing and medical handovers
- Notify receiving units and include information about positive result on all transfer/admission documents (if moved to another healthcare setting or referred for community care)
- CPE screening results must be included on all discharge letters for GP reference
- CPE electronic alerts will be added to WebICE

Notify IPCT if any patients are transferred with a known CPE positive result or are being traced as potential contacts from another healthcare facility

Early detection – screening contacts of confirmed cases

Screening of contacts (based on the likelihood of exposure) may be required if a patient is found to be positive for CPE and spent time in a multi occupancy bed space. Screening will be directed by the IPCT with the aim of identifying any further cases and instigate further control measures.

Provide information leaflet (Appendix B) and undertake screening for contacts of a positive case on the advice of the IPCT based on the likelihood of exposure as follows:

- Screening of patient contacts of a positive case **SHOULD** be undertaken if the case had spent time (≥ 8 hours) or remained in an open ward or bay with other patients before (or despite) having a positive CPE result.
- Screening of household contacts and healthcare staff is **NOT** required. The main focus should remain on promotion of enteric precautions throughout, especially hand hygiene.
- It is not necessary to isolate contacts whilst awaiting screening results – cohort such contacts if possible and/or reiterate strict standard precautions, particularly hand hygiene for staff and patients and decontamination of shared equipment.
- Screen all patients in the bay (or ward, if patient has occupied more than one bay) on a weekly basis for a period of 4 weeks after the last case was detected.
- Restrict screening to patient contacts remaining in hospital.

Should any contact screen positive, manage as positive case (see above).

In discussion with the local Public Health England PHE Centre, screening the whole ward PLUS discharged patients who occupied the bay (or ward, if case occupied more than one bay) at same time as case may be considered by the DIPC and IPCT.

7.6 Managing a patient with a CPE (colonisation/infection) in an Inpatient setting

Infection Prevention and Control key measures summary		
Precaution/ measure	Yes/No or N/A	COMMENTS
Isolation	Yes	Isolate patient in a single room with enteric precautions if risk factor triggered. Positive (currently or previously) should remain isolated for the duration of their inpatient stay.
Can patients be cohort nursed? (multiple patients in one bay)	No	Only under special circumstances as directed by the IPCT following advice from the ECCHs IPC Doctor.
Gloves	Yes	Wash hands with soap and water after removing gloves. Change gloves and decontaminate hands when moving from one body site to another on the same patient
Aprons/Gowns	Yes	Where any part of staff uniform/clothing, not covered by a standard apron, is expected to come into contact with the patient, a long sleeved disposable gown should be used (e.g. when assisting movement for a dependent patient, bed bathing, wound dressing changes)
Mask & eye protection	Risk assess	If there is a risk of bodily fluids splashing/contaminating your face or if undertaking an aerosol generating procedure e.g. airway suction.
Dedicated equipment	Yes	Dedicated observation equipment (blood pressure cuff, thermometer, and stethoscope). Non-dedicated equipment must be thoroughly disinfected after use using Clinell/Medipal wipes (Green) or in the presence of diarrhoea, SoChlor solution. Re-usable SSD instruments to be managed according to ECCH procedures.
Cleaning measures	Yes	Daily cleaning and disinfection with SoChlor solution is a key control measure. Clinical clean must take place on discharge. Mattresses must be checked prior to cleaning and disinfecting.
Linen and Waste		Treat as 'infected' as per Laundry policy and waste categorised as Infectious waste as per the Waste policy
Antibiotic Management	Clinically assess	If signs of infection, contact Duty Medical Microbiologist for clinical review and advice.
Visiting restrictions	Risk assess	Visitors must follow IPC precautions (PPE & hand hygiene)
Patient/relatives information	Yes	CPE leaflets available for screening, contacts & positive results. See Appendices
Inform Occupational Health	Risk assess	Not unless managing an outbreak in which staff screening is required as directed by the organisations IPC Doctor or a member of staff is found to be colonised/ infected with CPE.
Inform other service providers	Yes	Ensure other departments/wards are notified of the patient's CPE status and necessary precautions as appropriate when patient is transferred for diagnostic/ therapeutic purposes
Discharge	Yes	CPE patients can be discharged to community settings, but their status must be clearly communicated in advance of the discharge and the GP notified in the discharge letter.

7.7 Additional services, investigations and interventions

All additional services, investigations and interventions will need to be risk assessed based on the clinical need and the CPE status of the patient. The IPCT can assist in this risk assessment process if required.

Diagnostic tests and attendance at Outpatient Services

Diagnostic Tests

Should a patient who is colonised or has an infection require a diagnostic test or procedure which cannot be undertaken in the patient's room, close liaison must take place with the receiving department and any transport services utilised.

Therapy services

All therapy services will continue as clinical need dictates. The patient should be visited last if practicably possible. All therapy staff will adhere strictly to the use of appropriate PPE, hand hygiene and the thorough decontamination of any equipment used during their assessment in line with section.

Trolleys and Wheelchairs

Trolleys and wheelchairs used to transfer patients must be thoroughly cleaned and disinfected after use for a patient transfer with Medipal wipe (Green) if the patient is suffering with diarrhoea, use SoChlor Plus solution

Non-essential services

Non-essential services including the following: Newspaper trolley, Library trolley and sweet trolley will not go into the rooms accommodating patients with CPE but will continue on other areas of the ward not used for patients with CPE. Patients requiring items can request that staff to go to the trolleys on their behalf.

Visitors

All visitors entering an isolation room should be advised to use aprons and gloves and wash their hands with soap and water before and after each patient contact. Any refusal to do so should be addressed by senior members of the clinical team and records of advice given be documented in the patient's Patient Care Record (PCR).

7.8 Cleaning (Routine and Terminal Cleaning)

Daily cleaning

Isolation rooms must be cleaned daily by domestic services using SoChlor solution. The patient should be encouraged to minimise their belongings being stored on surfaces in the room to allow the domestic staff to clean the room effectively.

Scrupulous cleaning and disinfection of all surfaces is required with particular attention to those that may have had patient or staff hand contact.

Clinical staff are responsible for cleaning and disinfecting the dedicated clinical equipment in the isolation room on a daily basis and documenting these actions.

- Patient wash water, body fluids or secretions, **must not** be discarded down a clinical hand wash basin as this poses a high risk of environmental contamination.
- Pulse oximeters require normal cleaning and disinfection after each use or be single-patient use only.
- Blood pressure cuffs should be single-patient use only. Disposable single patient use cuffs are recommended.
- Stethoscopes and thermometers should be dedicated for single-patient use only.

Cleaning following discharge/transfer

- Following discharge/ transfer of the patient, the room and its contents should be cleaned and disinfected thoroughly as per the IPCT instructions. Special attention should be paid to removing all faecal soiling, and in particular to cleaning of furniture, toilets, commodes, call bells etc. fittings, and to horizontal surfaces.
- Unused wrapped single-use items in the patient's immediate vicinity (that may have become contaminated by hand contact) should be discarded. The burden of this may be minimised by keeping limited stocks near the patient.
- Tubes of ointment and lubricant must be disposed of.
- All mattress and pillow covers should be inspected (unzipped), cleaned and disinfected by clinical staff and all elements replaced if torn or leaking.
- Dynamic mattresses must be cleaned, bagged and then sent off site for thorough decontamination as per the protocol for infected mattresses.
- As part of the clinical clean all curtains must be removed from the bed space.
- Lavatory brushes and their holders should be disposed of as part of the clinical clean.

7.9 Managing a patient with a CPE (colonisation/infection) in a Community setting (i.e.

Not a hospital inpatient)

ECCH Clinic Areas

- A record of the patient's status, any specimen results and the micro-organism involved must be recorded in the patient's notes.
- Known CPE positive patients (check WebICE alerts) should be planned at the end of the clinic list if possible, to enable thorough environmental cleaning to be undertaken following the appointment. Effective and thorough standard precautions, environmental and equipment cleaning must be followed strictly for all patients in these departments given the restrictions in identifying these patients prior to arrival in clinic. For all patients, if an admission is being planned, the Inpatient risk assessment questions must be completed, and the receiving ward/department must be notified of the need for isolation facilities with enteric precautions and the need for CPE samples as per this guideline.
- Contact precautions must be maintained by all health care staff at all times, in line with the standards within ECCHs Isolation Policy.
- Clean, non-sterile gloves should be worn when there is to be contact with an infected or colonised patient, their equipment or their environment. Change gloves and decontaminate hands when moving from one site to a different site on the same patient
- A clean plastic apron should be worn if there is to be contact with an infected or colonised patient, their equipment, their environment, or during procedures where contamination of clothing may occur. Standard aprons are normally sufficient, however, where any part of staff uniform/clothing, not covered by a standard apron, is expected to come into contact with the patient, their equipment or surroundings, a **long sleeved disposable gown** should be used (e.g., when assisting movement for a dependent patient, large wound dressing changes).
- Gloves and aprons should be removed and disposed of into an orange hazardous infectious waste bag before leaving the clinic room. Hands should then be decontaminated immediately by washing with soap and water.
- All waste must be disposed of via the hazardous infectious waste stream e.g. soft waste into orange waste bags
- All equipment used on affected patients must be thoroughly cleaned and disinfected or sterilised before returning to communal use (See ECCHs Decontamination Policy). Clinical Equipment must be thoroughly cleaned and disinfected after every use using Medipal/Clinell

wipes (green) or SoChlor solution, should be used if the patient has diarrhoea. Any re-usable SSD instruments should be returned in the normal way.

- For all patients, if an admission is being planned, the risk assessment questions must be completed, and the receiving ward/department must be notified of the need for isolation facilities with enteric precautions and the need for CPE samples as per this policy.
- Communication – ensure that any service involved in the provision of health and social care are aware of the patient’s CPE status. This is especially important where admission to a hospital setting is necessary. Information leaflets are available for patients, relatives and contacts (please see Appendices).
- If required, patients should be provided with the relevant information leaflet by clinic staff (See Appendices).

8. Core Standards – Patient’s Homes and Care Homes

- 8.1 A record of the patient’s status, any specimen results and the micro-organism involved must be recorded in the patient’s notes.
- 8.2 Clean, non-sterile gloves should be worn when there is to be contact with an infected or colonised patient, their equipment or their environment. Change gloves and decontaminate hands when moving from one site to a different site on the same patient
- 8.3 A clean plastic apron should be worn if there is to be contact with an infected or colonised patient, their equipment or their environment or during procedures where contamination of clothing may occur.
N.B. Standard aprons are normally sufficient, however, where any part of staff uniform/clothing, not covered by a standard apron, is expected to come into contact with the patient, their equipment or surroundings, a long sleeved disposable gown should be used (e.g., when assisting movement for a dependent patient, wound dressing changes).
- 8.4 Hands should be decontaminated by washing with soap and water.
- 8.5 All items used on affected patients must be thoroughly cleaned and disinfected or sterilised before returning to communal use in line with the standards set in ECCHs Decontamination Policy. Equipment must be thoroughly cleaned and disinfected after every use using Medipal/Clinell wipes (green). SoChlor solution should be used if the patient has diarrhoea. Any re-usable SSD instruments should be returned in the normal way.
- 8.6 Waste – waste generated as a result of healthcare interventions must be categorised as per the Community Risk Assessment tool
- 8.7 Patients should receive the relevant information leaflet (See Appendices).

8.8 Additional advice for households

- Environmental hygiene – Maintaining good hygiene in the household is a key control measure especially in toilets/bathroom areas and if the patient has diarrhoeal symptoms.
- Linen – launder bedlinen and clothing at the highest temperatures tolerated by the fabrics, tumble dry and iron

Patients

Screening of patients outside of hospitals is not routinely undertaken but may be indicated in the event of an outbreak or where patients have been identified as at high-risk of CPE carriage. Any screening requirement will be on the advice of the IPAC team in consultation with the Trust’s Infection Control Doctor/Consultant Medical Microbiologist.

9. REVIEW

This policy will be reviewed by the Infection Prevention and Control Team

10. REFERENCES

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11. AUTHOR

Infection Prevention and Control Team

APPENDICES

Appendix A

INPATIENT UNITS

Carbapenemase-producing Enterobacteriaceae: I am colonised / have an infection – what does this mean?

What does ‘carbapenemase-producing Enterobacteriaceae’ mean?

Enterobacteriaceae are bacteria that usually live harmlessly in the gut of humans. This is called ‘colonisation’ (a person is said to be a ‘carrier’). However, if the bacteria get into the wrong place, such as the bladder or bloodstream they can cause infection. Carbapenems are one of the most powerful types of antibiotics. Carbapenemases are enzymes (chemicals), made by some strains of these bacteria, which allow them to destroy carbapenem antibiotics and so the bacteria are said to be resistant to the antibiotics.

Why does carbapenem resistance matter?

Carbapenem antibiotics can only be given in hospital directly into the bloodstream. Until now, doctors have relied on them to successfully treat certain ‘difficult’ infections when other antibiotics have failed to do so. In a hospital, where there are many vulnerable patients, spread of resistant bacteria can cause problems.

Does carriage of carbapenemase-producing Enterobacteriaceae need to be treated?

If a person is a carrier of carbapenemase-producing Enterobacteriaceae (sometimes called CPE), they do not need to be treated. However, if the bacteria have caused an infection then antibiotics will be required.

How did I ‘pick up’ carbapenemase-producing Enterobacteriaceae?

Do ask your doctor or nurse to explain this to you in more detail. As mentioned above, sometimes this bacterium can be found, living harmlessly, in the gut of humans and so it can be difficult to say when or where you picked it up. However, there is an increased chance of picking up these bacteria if you have been a patient in a hospital abroad or in a UK hospital that has had patients carrying the bacteria, or if you have been in contact with a carrier elsewhere.

How will I be cared for whilst in hospital?

You will be accommodated in a single room with toilet facilities whilst in hospital. You may be asked to provide a number of samples, depending on your length of stay, to check if you are still carrying the bacteria. The samples might include a number of swabs from certain areas, such as where the tube for your drip (if you have one) enters the skin, a rectal swab i.e., a sample taken by inserting a swab briefly just inside your rectum (bottom), and / or a faecal sample. You will normally be informed of the results within two to three days.

How can the spread of carbapenemase-producing Enterobacteriaceae be prevented?

Accommodating you in a single room helps to prevent spread of the bacteria. Healthcare workers should wash their hands regularly. They will use gloves and aprons when caring for you. The most important measure for you to take is to wash your hands well with soap and water, especially after going to the toilet. You should avoid touching medical devices (if you have any) such as your urinary catheter tube and your intravenous drip, particularly at the point where it is inserted into the body or skin. Visitors will be asked to wash their hands on entering and leaving the room and may be asked to wear an apron.

What about when I go home?

Whilst there is a chance that you may still be a carrier when you go home quite often this will go away with time. No special measures or treatment are required; any infection will have been treated prior to your discharge. You should carry on as normal, maintaining good hand hygiene. If you have any concerns you may wish to contact your GP for advice.

Before you leave hospital, ask the doctor or nurse to give you a letter or card advising that you have had an infection or been / are colonised with carbapenemase-producing Enterobacteriaceae. This will be useful for the future and it is important that you make health care staff aware of it. Should you or a member of your household be admitted to hospital, you should let the hospital staff know that you are or have been a carrier and show them the letter / card.

Where can I find more information?

If you would like any further information please speak to a member of your care staff, who may also contact the Infection Prevention and Control Team for you. The Public Health England website is another source of information: <https://www.gov.uk/government/collections/carbapenem-resistance-guidance-data-and-analysis>

Appendix B

INPATIENT UNITS

Carbapenemase-producing Enterobacteriaceae: I may be a carrier (or have an infection) – what does this mean?

What does ‘carbapenemase-producing Enterobacteriaceae’ mean?

Enterobacteriaceae are bacteria that usually live harmlessly in the gut of humans. This is called ‘colonisation’ (a person is said to be a ‘carrier’). However, if the bacteria get into the wrong place, such as the bladder or bloodstream they can cause infection. Carbapenems are one of the most powerful types of antibiotics. Carbapenemases are enzymes (chemicals), made by some strains of these bacteria, which allow them to destroy carbapenem antibiotics and so the bacteria are said to be resistant to the antibiotics.

Why does carbapenem resistance matter?

Carbapenem antibiotics can only be given in hospital directly into the bloodstream. Until now, doctors have relied on them to successfully treat certain ‘difficult’ infections when other antibiotics have failed to do so. Therefore, in a hospital, where there are many vulnerable patients, spread of these resistant bacteria can cause problems.

Does carriage of carbapenemase-producing Enterobacteriaceae need to be treated?

If a person is a carrier of carbapenemase-producing Enterobacteriaceae (sometimes called CPE), they do not need to be treated. As mentioned, these bacteria can live harmlessly in the gut. However, if the bacteria have caused an infection then antibiotics will be required.

How will I know if I am at risk of being a carrier or having an infection?

Your doctor or nurse may suspect that you are a carrier if you have been in a hospital abroad, or in a UK hospital that has had patients carrying these bacteria, or if you have been in contact with a carrier elsewhere. If any of these reasons apply to you, screening will be arranged for you and you will be accommodated in a single room with your own toilet facilities at least until the results are known.

How will I be screened for carbapenemase-producing Enterobacteriaceae?

Screening usually entails taking a rectal swab by inserting it just inside your rectum (bottom). Alternatively, you may be asked to provide a sample of faeces. The swab / sample will be sent to the laboratory and you will normally be informed of the result within two to three days. If the result is negative, the doctors or nurses may wish to check that a further two samples are negative before you can be accommodated on the main ward. These measures will not hinder your care in any way. If all results are negative no further actions are required.

Advice for patients who have a positive result

What happens if the result is positive?

If the result is positive, do ask your doctor or nurse to explain this to you in more detail. You will continue to be accommodated in a single room whilst in hospital. If you have an infection, you will need to have antibiotics. However, if there are no signs of infection and you are simply ‘carrying’ the bacteria, no treatment is required.

How can the spread of carbapenemase-producing Enterobacteriaceae be prevented?

Accommodating you in a single room, if the result is positive, helps to prevent spread of the bacteria. Healthcare workers should wash their hands regularly. They will use gloves and aprons when caring for you. The most important measure for you to take is to wash your hands well with soap and water, especially after going to the toilet. You should avoid touching medical devices (if you have any) such as your urinary catheter tube and your intravenous drip, particularly at the point where it is inserted into the body or skin. Visitors will be asked to wash their hands on entering and leaving the room and may be asked to wear an apron.

What about when I go home?

Whilst there is a chance that you may still be a carrier when you go home, quite often this will go away with time. No special measures or treatment are required; any infection will have been treated prior to your discharge. You should carry on as normal, maintaining good hand hygiene. If you have any concerns you may wish to contact your GP for advice.

Before you leave hospital, ask the doctor or nurse to give you a letter or card advising that you have had an infection or been colonised with carbapenemase-producing Enterobacteriaceae. This will be useful for the future and it is important that you make health care staff aware of it. Should you or a member of your

household be admitted to hospital, you should let the hospital staff know that you are, or have been, a carrier and show them the letter / card.

Where can I find more information?

If you would like any further information please speak to a member of your care staff, who may also contact the Infection Prevention and Control Team for you. The Public Health England website is another source of information:

<https://www.gov.uk/government/collections/carbapenem-resistance-guidance-data-and-analysis>

Appendix C

INPATIENT UNITS

Carbapenemase-producing Enterobacteriaceae – I am a contact of someone who is a carrier or has an infection – what does this mean?

What does ‘carbapenemase-producing Enterobacteriaceae’ mean?

Enterobacteriaceae are bacteria that usually live harmlessly in the gut of humans. This is called ‘colonisation’ (a person is said to be a ‘carrier’). However, if the bacteria get into the wrong place, such as the bladder or bloodstream they can cause infection. Carbapenems are one of the most powerful types of antibiotics. Carbapenemases are enzymes (chemicals), made by some strains of these bacteria, which allow them to destroy carbapenem antibiotics and so the bacteria are said to be resistant to the antibiotics.

Why does carbapenem resistance matter?

Carbapenem antibiotics can only be given in hospital directly into the bloodstream. Until now, doctors have relied on them to successfully treat certain ‘difficult’ infections when other antibiotics have failed to do so. Therefore, in a hospital, where there are many vulnerable patients, spread of resistant bacteria can cause problems.

Does carriage of carbapenemase-producing Enterobacteriaceae need to be treated?

If a person is a carrier of carbapenemase-producing Enterobacteriaceae (sometimes called CPE), they do not need to be treated. As mentioned, these bacteria can live harmlessly in the gut. However, if the bacteria have caused an infection then antibiotics will be required.

How is carbapenemase-producing Enterobacteriaceae spread?

If a patient in hospital is carrying this bacteria it can get into the ward environment and can also be passed on by direct contact with that particular patient. For that reason, the patient will normally be accommodated in a single room. Effective environmental cleaning and good hand hygiene by all, staff and patients, can reduce the risk of spread significantly.

Do I need to be screened?

Occasionally, it isn’t immediately known that a patient is carrying this bacteria and so they may not be placed into a single room straight away. Screening will be offered if you have shared the same bay (or ward) with a patient who has been found to be carrying carbapenemase-producing Enterobacteriaceae. This screening is offered as there is a *slight* chance that you could have picked up the bacteria and are carrying it too.

How will I be screened for carbapenemase-producing Enterobacteriaceae?

Screening usually entails taking a rectal swab by inserting it just inside your rectum (bottom). Alternatively, you may be asked to provide a sample of faeces. The swab / sample will be sent to the laboratory and you will normally be informed of the result within two to three days. If the result is negative nothing further is required unless you are staying in hospital for some time. In that case, you will probably be asked to provide a sample on a regular basis e.g. once a week, as a precautionary measure.

What if the result is positive?

If the result is positive do ask your doctor or nurse to explain this to you in more detail and to provide a leaflet relating to positive results (Card C.4). You will be given a single room until you leave hospital. No treatment is necessary unless you have an infection when antibiotics will be given.

Where can I find more information?

The Public Health England web site is another source of information:

<https://www.gov.uk/government/collections/carbapenem-resistance-guidance-data-and-analysis>

Appendix D

Advice for individuals receiving care at home or in a community care setting who have an infection with or are colonised by carbapenemase-producing Enterobacteriaceae

What are ‘carbapenemase-producing Enterobacteriaceae’?

Enterobacteriaceae are bacteria that usually live harmlessly in the gut of humans. This is called ‘colonisation’ (a person is said to be a ‘carrier’). However, if the bacteria get into the wrong place, such as the bladder or bloodstream they can cause infection.

Carbapenemase-producing Enterobacteriaceae (sometimes abbreviated to CPE) are Enterobacteriaceae which have become resistant to carbapenems, a group of powerful antibiotics. The resistance is helped by Carbapenemases, enzymes made by some strains of the bacteria, which allow them to destroy carbapenem antibiotics and so becoming resistant to them and most other penicillin-like antibiotics.

Why does carbapenem resistance matter?

Carbapenem antibiotics can only be given in hospital directly into the bloodstream. Until now, doctors have relied on them to successfully treat certain ‘difficult’ infections when other antibiotics have failed to do so. Therefore, in a hospital or other care setting, where there are many vulnerable patients, spread of these resistant bacteria can cause problems.

Does carriage of carbapenemase-producing Enterobacteriaceae need to be treated?

If you are carrier of carbapenemase-producing Enterobacteriaceae, you do not need to be treated. As mentioned, these bacteria can live harmlessly in the gut. However, if the bacteria have caused an infection then antibiotics will be required. Please do ask your doctor or healthcare worker to explain your situation to you in more detail.

How can the spread of carbapenemase-producing Enterobacteriaceae be prevented?

The most important measure you can take is to maintain effective hand hygiene, washing your hands well with soap and water, especially after going to the toilet. You should avoid touching any medical devices (such as your urinary catheter tube or other medical tubes) if you have any, particularly at the point where it is inserted into the body or skin.

As you are receiving care in your own home, you should not restrict your lifestyle in any way; however a few sensible measures will prevent spread to others. As well as effective hand hygiene, keeping toilet and bathroom areas clean, and using separate towels, are the best ways to prevent spread. You should expect that visiting healthcare workers will clean their hands on arrival, before and after providing direct care, and on leaving. They will use gloves and an apron when caring for you.

What about my family and visitors?

There is no need for you to advise visitors that you are a carrier or have an infection, as long as hygiene measures are adequate. If you have an infection, it is important to work with your healthcare worker to ensure that any discharge from a wound, for example, is contained within an appropriate dressing to prevent contamination of clothes or soft furnishings.

Your doctor or nurse may give you a letter or card advising that you have had an infection or been colonised with carbapenemase-producing Enterobacteriaceae. This will be useful for the future and it is important that you make health care staff aware of it. Should you or a member of your household be admitted to hospital or other healthcare facility, you should let the hospital staff know that you are, or have been, a carrier and show them the letter / card.

Where can I find more information?

If you have any concerns or queries you may wish to speak to your healthcare worker or contact your GP for advice. Alternatively, if you would like any further information the Public Health England website is another source:

<https://www.gov.uk/government/collections/carbapenem-resistance-guidance-data-and-analysis>

Appendix E

Advice for contacts of a carbapenemase-producing Enterobacteriaceae (CPE) carrier living at home or in a community care setting

What are ‘carbapenemase-producing Enterobacteriaceae’?

Enterobacteriaceae are bacteria that usually live harmlessly in the gut of humans. This is called ‘colonisation’ (a person is said to be a ‘carrier’). However, if the bacteria get into the wrong place, such as the bladder or bloodstream, they can cause infection.

Carbapenemase-producing Enterobacteriaceae (sometimes abbreviated to CPE) are Enterobacteriaceae which have become resistant to carbapenems, a group of powerful antibiotics. The resistance is helped by Carbapenemases, enzymes made by some strains of the bacteria, which allow them to destroy carbapenem antibiotics and so become resistant to them and most other penicillin-like antibiotics.

Why does carbapenem resistance matter?

Carbapenem antibiotics can only be given in hospital directly into the bloodstream. Until now, doctors have relied on them to successfully treat certain ‘difficult’ infections when other antibiotics have failed to do so. Therefore, in a hospital, where there are many vulnerable patients, spread of resistant bacteria can cause problems.

Does carriage of carbapenemase-producing Enterobacteriaceae need to be treated?

If a person is a carrier of carbapenemase-producing Enterobacteriaceae, they do not need to be treated. As mentioned, these bacteria can live harmlessly in the gut. However, if the bacteria have caused an infection then antibiotics will be required.

How are carbapenemase-producing Enterobacteriaceae spread?

In a hospital or healthcare setting when a patient is carrying this bacterium, the environment can become contaminated which can then spread to others through direct or indirect contact. Staff work hard to ensure that the environment is kept clean, and you will see staff cleaning their hands. If you have any concerns please speak to the staff or your carer.

What does being a contact of a carrier mean?

This means that you have been in the same ward or care environment as a person who is a carrier of carbapenemase-producing Enterobacteriaceae.

Do I need screening?

As a contact of a carrier, if you are admitted to hospital you may be offered screening for carbapenemase-producing Enterobacteriaceae. This screening is offered as there is a *slight* chance that you could have picked up the bacteria and are carrying it too.

Do I need treatment?

Carrying carbapenemase-producing Enterobacteriaceae is not a risk to healthy people. The most important measure to take is to maintain good hand hygiene, washing hands with soap and water, especially after going to the toilet. Good hygiene such as keeping toilet and bathroom areas clean and using separate towels are the best ways to prevent the spread. Clothes and laundry should be washed normally at the hottest temperature advised on the label.

Where can I find more information?

If you have any concerns or queries you may wish to speak to your healthcare worker or contact your GP for advice. Alternatively, if you would like any further information the Public Health England website is another source of information:

<https://www.gov.uk/government/collections/carbapenem-resistance-guidance-data-and-analysis>

Appendix F

Advice for the family of a person who is a carrier of a carbapenemase-producing Enterobacteriaceae (CPE)

What are ‘carbapenemase-producing Enterobacteriaceae’?

Enterobacteriaceae are bacteria that usually live harmlessly in the gut of humans. This is called ‘colonisation’ (a person is said to be a ‘carrier’). However, if the bacteria get into the wrong place, such as the bladder or bloodstream, they can cause infection.

Carbapenemase-producing Enterobacteriaceae (sometimes abbreviated to CPE) are Enterobacteriaceae which have become resistant to carbapenems, a group of powerful antibiotics. The resistance lies in Carbapenemases, enzymes made by some strains of the bacteria that enable them to destroy carbapenem antibiotics and so become resistant to them and most other penicillin-like antibiotics.

Why does carbapenem resistance matter?

Carbapenem antibiotics can only be given in hospital directly into the bloodstream. Until now, doctors have relied on them to successfully treat certain ‘difficult’ infections when other antibiotics have failed to do so. Therefore, in a hospital, where there are many vulnerable patients, spread of bacteria resistant to carbapenems can cause problems.

Does carriage of carbapenemase-producing Enterobacteriaceae need to be treated?

If a person is a carrier of carbapenemase-producing Enterobacteriaceae (sometimes called CPE), they do not need to be treated. As mentioned, these bacteria can live harmlessly in the gut. However, if the bacteria have caused an infection then antibiotics are needed.

What are ‘carbapenemase-producing Enterobacteriaceae’?

Enterobacteriaceae are bacteria that usually live harmlessly in the gut of humans. This is called ‘colonisation’ (a person is said to be a ‘carrier’). However, if the bacteria get into the wrong place, such as the bladder or bloodstream, they can cause infection.

Carbapenemase-producing Enterobacteriaceae (sometimes abbreviated to CPE) are Enterobacteriaceae which have become resistant to carbapenems, a group of powerful antibiotics. The resistance lies in Carbapenemases, enzymes made by some strains of the bacteria that enable them to destroy carbapenem antibiotics and so become resistant to them and most other penicillin-like antibiotics.

Why does carbapenem resistance matter?

Carbapenem antibiotics can only be given in hospital directly into the bloodstream. Until now, doctors have relied on them to successfully treat certain ‘difficult’ infections when other antibiotics have failed to do so. Therefore, in a hospital, where there are many vulnerable patients, spread of bacteria resistant to carbapenems can cause problems.

Does carriage of carbapenemase-producing Enterobacteriaceae need to be treated?

If a person is a carrier of carbapenemase-producing Enterobacteriaceae (sometimes called CPE), they do not need to be treated. As mentioned, these bacteria can live harmlessly in the gut. However, if the bacteria have caused an infection then antibiotics are needed.

Where can I find more information?

If you have any concerns or queries you may wish to speak to your healthcare worker or contact your GP for advice. Alternatively, if you would like any further information the Public Health England website is another source of information:

<https://www.gov.uk/government/collections/carbapenem-resistance-guidance-data-and-analysis>

Appendix G

INPATIENT UNITS – Where admission is planned.

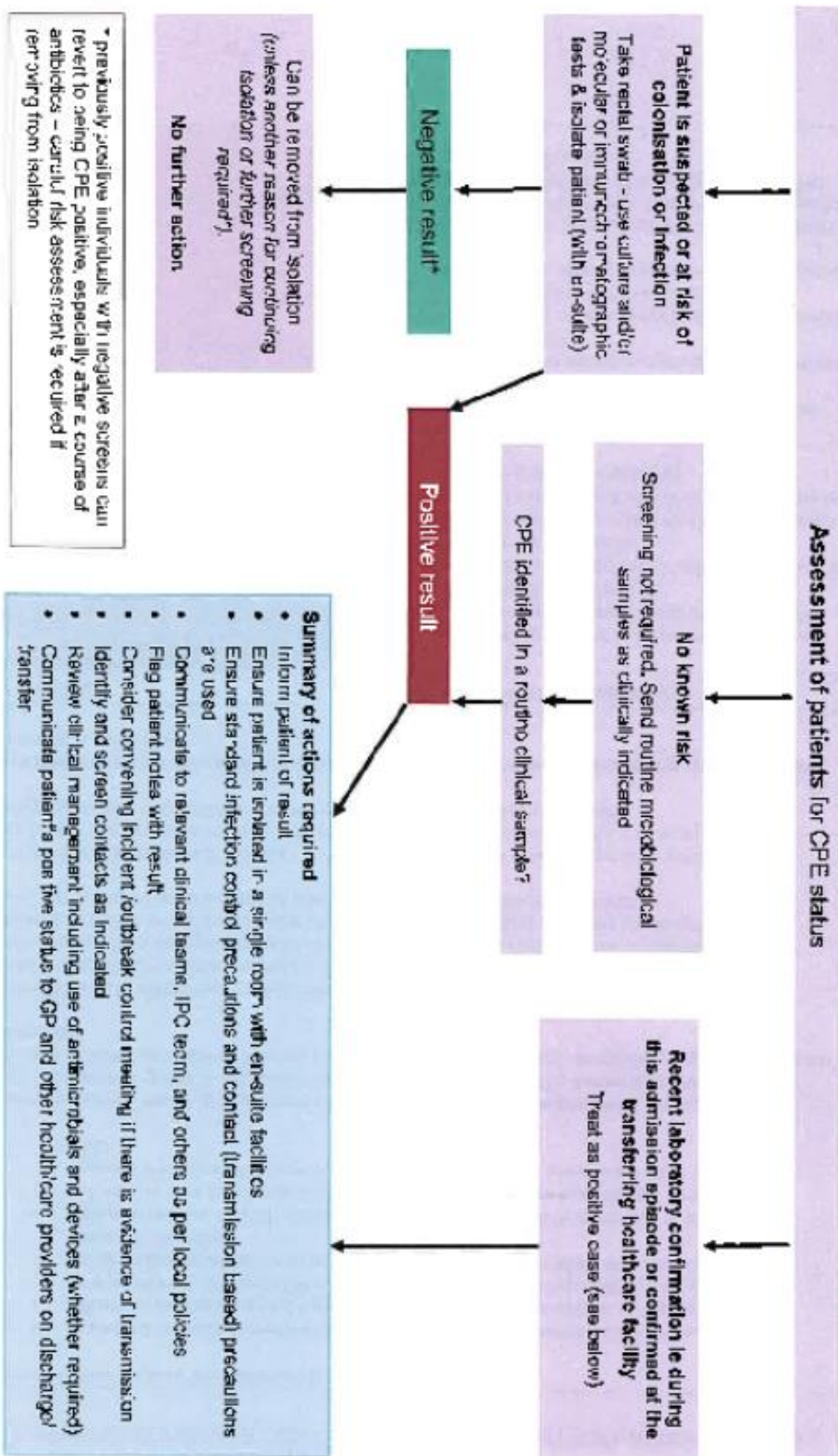
Risk factor assessment for patient exposure to Carbapenemase-producing Enterobacteriaceae (CPE)

Name: DOB: Address: GP: NHS Number		To be completed for ALL patients prior to or on admission to assess and manage the risk of CPE within ECCH inpatient wards.	
QUESTIONS	Yes	No	Comments
1. In the last 12 months been previously identified as CPE positive.			
2. In the last 12 months been an inpatient in any hospital in the UK or abroad.			
3. In the last 12 months had multiple hospital treatments, e.g. dialysis dependant.			
4. Had a known epidemiological link to a known carrier of CPE.			
5. They are admitted in to augmented care or high risk units. E.g., immunosuppressed, critical care burns units.			
<p>If the patient answers YES to any of the above, manage as a potential case of CPE.</p> <ul style="list-style-type: none"> • Advise patient they meet criteria for screening & offer patient leaflet (Appendix) • Isolate in a single room (en-suite if available, or a designated commode if not) with enteric precautions. Delays in isolation may lead to contact tracing and screening if a positive case is identified. • Send rectal swab or stool sample as soon as possible for CPE screening. • Include CPE risk in handover to receiving ward and relevant healthcare teams. 			

Appendix D: How to conduct a risk CPE assessment in non-acute settings

<p>At all risk levels ensure the following:</p> <ul style="list-style-type: none"> • standard infection control precautions are maintained at all times • effective environmental hygiene and cleaning: 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 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. <p>Risk assessments must include consideration of the care environment, eg 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.</p> <p>If the individual is colonised: single room with en-suite facilities including toilet or designated commode is recommended; where a single room is not available, it is recommended that a designated toilet or commode is made available. No curtailment of communal activities is required where standard precautions and effective environmental hygiene are being maintained and there is no risk of transmission to others.</p> <p>If the individual is infected: conduct a risk assessment with your IPC advisor and/or PHE contact to discuss possible isolation (with defined end-of-isolation criteria) consider the mental and physical health and wellbeing of the individual when deciding to isolate.</p> <p>Always communicate the positive status of an individual when transferring the individual between care settings.</p>	
Care needs	Guidance for risk assessment
<p>HIGH RISK</p> <p>For example, the individual has diarrhoea, faecal incontinence, smearing or 'dirty protests' discharging wound, long term ventilation, confusion/dementia, device(s) in situ, undergoing invasive procedures</p>	<ul style="list-style-type: none"> • Identify if there is an immediate risk of infecting/contaminating others and the shared environment • Discuss management with GP/clinician in charge, IPC nurse • Consider the mental and physical health and wellbeing of the individual and the level of supervision required
<p>MEDIUM RISK</p> <p>For example, the individual requires assistance with hygiene, mobility or physical rehabilitation</p>	<p>No immediate risk of infecting others identified:</p> <ul style="list-style-type: none"> • Standard infection control precautions are maintained • Hygiene advice is provided to individual and family/contacts as appropriate • Maintain effective environmental hygiene
<p>LOW RISK</p> <p>For example, the individual is independent and self-caring</p>	<p>If unsure, contact your usual IPC advisor or PHE via the local Health Protection Team or Consultant in Public Health Infection, or local Community IPC Team where available</p>

Appendix E: Acute care – flow chart of infection prevention and control measures to contain CPE



Informed by: Pugh D, Kyriakou T, Donker T, Stobasser N, Froome R, Shaw K, Hope R, Ho-Yine S, Roderick J. A transmission model of carbapenemase-producing Enterobacteriales transmission and control in the English hospital setting. *Antonie van Leeuwenhoek*.

**Appendix F: Risk assessment tool for isolating CPE-positive patients
(when isolation room capacity is limited)**

	Yes	No
Does the patient have diarrhoea? (Type 6/7 on Bristol Stool Chart)	Nurse in a side room on a general ward	See questions below
Is the patient...	Yes	No
Continent of urine and faeces?	✓	
Alert and orientated?	✓	
Independently mobile?	✓	
<i>→ Consider caring for the patient in a bay on a general ward</i>		
Is the patient...	Yes	No
Continent of urine and faeces?		✗
Alert and orientated?	✓	
Independently mobile?	✓	
<i>→ Patient to be nursed in a side room on general ward (refer to Continence Nurse for additional advice regarding the management of continence, if available)</i>		
Is the patient...	Yes	No
Continent of urine and faeces?	✓	
Alert and orientated?		✗
Independently mobile?	✓	
<i>→ Take into account clinical environment and risk: consider moving patient to an alternative area if confused and unable to comply with isolation in a side room</i>		
Is the patient...	Yes	No
Continent of urine and faeces?	✓	
Alert and orientated?	✓	
Independently mobile?		✗
<i>→ Patient can be nursed in a bay on a general ward with a dedicated commode</i>		