Carbapenemase-producing Enterobacteriacea

Infection Prevention and Control Team
NHS GGC
What are CPE?

- **Enterobacteriaceae** are a family of Gram-negative bacteria which are part of the normal range of bacteria found in the gut of all humans and animals.

- They commonly cause opportunistic urinary tract, intra-abdominal and bloodstream infections.

- They include species such as *E. coli*, *Klebsiella sp.*, *Proteus sp.* and *Enterobacter sp.*
Antibiotic resistance

- Carbapenems are a valuable family of very broad-spectrum antibiotics which are normally reserved for serious infections caused by drug-resistant Gram-negative bacteria. They include meropenem, ertapenem, imipenem and doripenem.

- CPE bacteria carry a gene for a carbapenemase enzyme that breaks down carbapenem antibiotics.
CPE infection

- Infections caused by CPE are associated with high rates of morbidity and mortality and can have severe clinical consequences.

- Treatment of these infections is increasingly difficult as these organisms are often resistant to many and sometimes all available antibiotics.

- Over the last decade CPE have spread throughout the world and are now endemic in healthcare facilities in many countries.
CPE in the UK

• In the UK, over the last five years, there has been 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. When appropriate control measures are implemented, these clusters and outbreaks can be managed effectively.
CPE action plan

• Early detection, prevention and control of CPE

• Identification and management of suspected and confirmed cases, and contacts.

• Early adoption of TBPs as well as SICPs

• Environmental cleaning and decontamination

• Microbiological testing

• Communications
Identification of suspected cases of CPE

- Use of a clinical risk assessment (CRA) tool
- Management of suspected cases identified by the CRA
- Management of confirmed cases
- Management of contacts of cases
CPE-CRA

The CRA defines a suspected case based on at least one of the following risk factors within the 12 month period preceding admission:

• Previously CPE positive

• Been an inpatient in a hospital outside of Scotland (includes holiday dialysis), in last 12 months

• Been a close contact of a person who has been colonised or infected with CPE
A close contact

A close contact is defined as a person living in the same house; sharing the same sleeping space (room or hospital bay); or a sexual partner.
Management of suspected case

- Patient should be immediately isolated in a single room with en-suite facilities (or designated commode if en-suite is unavailable)
- SICPs and contact TBPs should be applied as per the National Infection Prevention and Control Manual
- Screening samples(s) should be taken and sent for testing
- Ensure that the laboratory, IPCT and relevant clinicians have been informed
- Advise the patient (and relatives if appropriate) of reasons for isolation and the requirement for samples (including providing patient with an information leaflet)
- Advise the patient (and relatives if appropriate) about the importance of hand hygiene and personal hygiene in preventing transmission.
Screening samples

If a screening sample is required the following should be taken as a minimum:

• A rectal swab, making sure faecal material is visible on the swab

OR

• A stool sample (if a rectal swab is not feasible/acceptable)

AND

• A wound swab and/or urine sample if the patient is catheterised
Rectal swab

• A rectal swab is the best sample type and should always be considered preferential to a stool sample - with the exception of children.

• A rectal swab is taken by gently inserting a swab inside the rectum 3-4cms beyond the anal sphincter, rotating gently and removing. The swab should have visible faecal material. A rectal swab should not be mistaken for a perineal swab.

• Request CPE/CRO on Trak OR clearly mark ‘CPE screening sample’ on lab request form for microbiology.
Ordering on Trak

- Select your patient as usual.
- Tick the “Specimen collected” box
- Aliases available – carba, cre, cpe, cpo or any string in the test name above. Upper or lower case may be used.
- e.g. – Enter cpe (upper or lower case) in the “Item” and use the magnifying glass or the F6 key to bring up possible options
Pick list for appropriate samples. Guidance is provided in the processing notes box to the right hand side of the screen. Ensure you tick the box if you are collecting the samples straight away. If sampling a wound swab or skin swab, please choose a site from the site dictionary. Answer the questions as usual and enter password to file the order:
Send samples & request forms to the Microbiology Laboratory.
Sample result negative

- If the screening sample result is **NEGATIVE**, the patient should remain in isolation until a further **two consecutive samples test negative.** These samples should be taken 48 hours apart, i.e. take a sample on day 0 (the initial sample), day 2 and day 4.

- Once three consecutive negative are achieved, the patient can be removed from isolation, no further samples required.

- Should any subsequent samples test positive, the patient should be managed as a confirmed case
Confirmed case

- If not already, the patient should be immediately isolated and remain in isolation for the duration of their hospital stay.

- Samples should be obtained using the same protocol as described

- SICPs and contact TBPs should be applied

- A CPE case should be considered as highest priority for use of a single room facility and a local risk assessment to determine priorities should be undertaken with the IPCT.

- If the patient has an infection, they should be assessed for appropriate treatment
Confirmed case (cont)

- The patient, and family (as appropriate), should be informed of a positive result and the information leaflet provided.

- The patient should be advised (and relatives if appropriate) about the importance of hand hygiene (especially after using the toilet) and personal hygiene in preventing transmission of infection to others.

- The patient’s notes should be updated to include details of the positive CPE result.
Confirmed case (cont)

• Trak for the patient will be tagged with CPE

• Information about the positive result should be included on all transfer/admission documents if the patient is moved to another healthcare setting or referred for community care

• All relevant staff should be made aware when a patient is being treated as a suspected and/or confirmed CPE case

• It is not necessary to inform the SA to make different arrangements.
Subsequent admissions of a case

• Screening of previously positive patients is not required on subsequent admissions

• A previously positive patient should always be treated as positive and managed as a confirmed case. (In extenuating circumstances, e.g. patient’s wellbeing particularly in patients being cared for long term in acute care e.g. neuro-rehabilitation patients, if patient has 3 negative screens, a risk assessment by IPCT to removed from isolation).

• If positive patient requires a non-emergency diagnostic test or procedure out-with patient’s own room, procedure should be planned, wherever possible, at the end of the day’s list and the room cleaned.
OP and Renal dialysis

• Outpatients:
  Known positive outpatients who require renal dialysis, or a diagnostic test or procedure, should be planned, wherever possible, at the end of the day’s list and equipment cleaned as per the NIPCM.

• Holiday dialysis: If from outside of Scotland, treat as positive and place at end of list

• Known positive renal dialysis in-patients should be isolated, wherever possible.
Screening of contacts in a ward

- Screening of patients in the same setting is NOT normally required if the case was identified on admission and isolated immediately.

- Screening of patient contacts of a positive case SHOULD be undertaken if the case had spent time (or remained) in an open ward or bay with other patients before (or despite) having a positive result for CPE.

- It is not necessary to isolate contacts whilst awaiting screening results – cohort such contacts if possible and reiterate SICPs including hand hygiene for staff and patients

- Screen all patients (who are still in hospital) in the bay (or ward, if patient has occupied more than one bay) once only.

- Screening of household contacts and healthcare staff is NOT required.
Treatment

- No antibiotic treatment is required for colonisation

- Decolonisation is NOT advised for the following reasons:
  - Skin decolonisation- is not advised as these bacteria generally colonise the gut rather than the skin
  - Gut decolonisation (by prescribing antibiotics) – concern that their use would increase resistance in the longer term.

- Treatment should be guided by susceptibility results and under the advice of the microbiologist.
End

Any questions ?