

Carbapenemase Producing Enterobacteriaceae (CPE)

Quick Reference Guide for Screening and Management

for community inpatient settings (not mental health or learning disability)

Carbapenemase Producing Enterobacteriaceae (sometimes abbreviated to CPE) are a type of bacteria which have become resistant to carbapenems, a group of powerful antibiotics. This resistance is helped by enzymes called carbapenemases (made by some strains of bacteria), which allow them to destroy carbapenem antibiotics. This means these bacteria can cause infections that are not responsive to carbapenem antibiotics and many other antibiotics making them significantly more complicated and difficult to treat. Control of these bacteria is important to safeguard antibiotic effectiveness and prevent spread. As with any bacterial infections, patients who are colonised are at a greater risk of developing actual infections caused by their colonising strain.

Which Patients in Community Inpatient Settings should be Screened for CPE?

A patient who:

- has been a health tourist or had an inpatient stay in a hospital abroad in the last 12 months.
- has been admitted from a hospital outside of Gloucestershire, Herefordshire, Shropshire or Worcestershire or had an inpatient stay in a hospital outside of these areas in the last 12 months.
- reports being a household contact of someone with CPE (and therefore will require screening on each hospital admission if they have had continued contact with the confirmed case).
- has been identified as a contact through healthcare with someone who had CPE and does not have three negative screens. If three negative faecal screens are available since contact then this individual can be considered as clear and the requirement to screen linked to this criterion is not relevant.

A screen comprises of three stool specimens each taken at least 48 hours apart and labelled as CPE screen and one set of swabs from wounds, invasive devices and a CSU are also required as part of this screen.

Patients who have previously been identified with a CPE must be nursed in a single room with enteric precautions and do not require further screening. Patients who fulfil a need for screening samples, wherever possible must be nursed in a single room with enteric precautions until clearance, if appropriate, has been obtained. Toileting and personal hygiene must occur in own room or designated separate area. Please note, where screening is indicated for patients who are sharing care with other hospital providers, negative screens are required after each hospital inpatient stay. Seek further advice from the Infection Prevention and Control Nurses on 01386 502552.

Where and How do I Screen Someone?

Informed consent must be obtained and if a patient declines this must be documented in their medical notes. As a minimum, for patients who meet one of the above criteria, a stool specimen labelled "CPE screen" is required. In all patients who are being screened three negative screens and one set of negative results for wounds, invasive devices and a catheter specimen of urine for CPE are required. Note stool samples should be 48 hours apart.

- Samples must be collected in an appropriate stool specimen container. All specimens must be clearly labelled with patient details. Unlabelled or unidentified specimens will not be processed.
- Stool specimens can be contaminated with urine. Wound swabs and CSUs must be clearly labelled for CPE screen and for all samples the microbiology request form/online request documentation must state:- CPE screen and reason for this.
- On ICE request screen in *microbiology; swabs; MRSA and other screens*; options for faecal screen is then available. For swabs of wounds, invasive devices or CSU if indicated; these must be sent for MC&S and the need for a CPE screen must be included in the clinical details free text.

Interpreting the Laboratory Report

- A positive result indicates that an individual is either colonised or infected with a CPE. Treatment is only indicated if clinical signs and symptoms of infection are present. Treatment options should be discussed with the Consultant Medical Microbiologist.
- All results including three negative stool results are required before precautions can stop.
- Once a positive result has been obtained there is no requirement to rescreen, an individual will be considered positive for each and every healthcare admission.
- Advice can be sought from the Infection Prevention and Control Team on 01386 502552 or out of hours from the on call medical microbiologist via switchboard at Worcestershire Royal Hospital or the Alexandra Hospital, Redditch.

Other Infection Prevention and Control Recommendations/Further Advice:

- There is no requirement to actively treat colonisation.
- Enteric precautions linked to personal hygiene, toileting and where possible single room accommodation must continue throughout the duration of admission for those who are identified with a positive result, previous positive result or awaiting outcomes from screening swabs.
- Enteric precautions are further detailed in Trust Infection Prevention and Control Guidelines online via Trust A-Z or at www.worcestershirehealth.nhs.uk. Consider the use of patient information leaflets relating to screening/treatment. Seek advice from Infection Prevention and Control Team as required.

Summary

Careful risk assessment is required should it be deemed necessary to consider removing a previously positive or a colonised patient from single room accommodation and this must be discussed with the Infection Prevention and Control Team. Experience from other areas has shown that on some occasions, an apparently cleared carbapenemase-producer can return to a state of detectable levels in their gut flora so a previously positive individual with subsequent negative screening results can revert to a positive state, especially after a course of antibiotics, hence the need to always consider someone as colonised following a positive result.

If the individual is colonised or awaiting outcomes from screening: a single room with ensuite facilities including toilet or designated commode is recommended; curtailment of communal activities is not necessarily required where standard precautions and effective environmental hygiene are being maintained (patient is continent or continence is managed and there is no risk of infecting others).

If the individual is infected or colonisation level cannot be managed: isolation is required and a risk assessment will be conducted by IPCNs and clinical team to discuss end of isolation criteria and management as colonised. Consideration of the mental and physical health and wellbeing is essential in this process. **Should a patient who is colonised or has an infection require a diagnostic test or procedure which cannot be undertaken in their room,** the procedure should be planned at the end of the day's list and advice sought regarding cleaning of the room and equipment. For outpatients appointments, the department must be informed of patients who are known to have carriage of CPE, appointments should be planned for the end of the day's list and the department informed of carriage.

Resources to Support

- Patient information leaflet available on www.worcestershirehealth.nhs.uk or direct from Infection Prevention and Control Nurses.
- CPE passport issued by Infection Prevention and Control Teams across Worcestershire to promote awareness of need for precautions.

Glossary

Carbapenemases	Enzymes (such as KPC, OXA-48, NDM and VIM) produced by some bacteria which cause destruction of the carbapenem antibiotics, resulting in resistance – health professionals sometimes use this enzyme abbreviation only.
Carbapenems	Carbapenems are a group of powerful antibiotics, used to treat severe infections. They include meropenem, ertapenem, doripenem and imipenem.
Colonisation	The presence of micro-organisms living harmlessly on the skin or within the bowel and causing no signs or symptoms of infection.
Enterobacteriaceae	A group of Gram negative bacteria that usually live harmlessly in the gut of humans (and animals). They include <i>Escherichia coli</i> and <i>Klebsiella</i> . They can cause a variety of infections: eye/skin infections, meningitis, bacteraemia, pneumonia and urinary tract infections.
Enteric Precautions	Specific additional precautions which focus on minimising the risk of cross contamination linked to patients who are colonised or infected with gastro-intestinal tract microbes. Enteric precautions are used in conjunction with standard infection prevention and control precautions to further minimise risks of cross contamination. The focus is on enhanced environmental cleaning and ensuring that tasks where contamination is most likely occur in a designated area.
Infection	The presence of micro-organisms (germs) in the body causing adverse signs or symptoms.
Invasive device	A device or tube that enters the body through the skin (eg intravenous or percutaneous endoscopic gastrostomy [PEG] tube) or through an orifice (eg urinary catheter).
Standard precautions	Standard infection prevention and control precautions underpin routine safe practice, protecting staff and patients from micro-organisms that may cause infection. By applying them at all times with all patients the risks of infection are minimised.