Patient Screening for Carbapenemase Producing Enterobacteriaceae (CPE) Information for healthcare workers

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Information about CPE

What are Carbapenemase Producing Enterobacteriaceae (CPE)?

Enterobacteriaceae are a family of Gram-negative bacteria (sometimes called coliforms) which are part of the normal range of bacteria found in the gut. They include common pathogens such as *E. coli*, *Klebsiella* sp., *Proteus* sp. and *Enterobacter* sp.. When the bacteria live harmlessly in the gut without causing any problems, this is called colonisation. These organisms are some of the most common causes of many infections such as urinary tract infections, intra-abdominal infections and bloodstream infections, all of which can be life-threatening.

Carbapenemase-Producing Enterobacteriaceae (CPE) are a type of bacteria that are extremely resistant to antibiotics. These bacteria carry a gene for a carbapenemase enzyme that breaks down carbapenem antibiotics.

Carbapenems are a class of very broad-spectrum intravenous antibiotics which are used to treat serious infections or conditions where other therapeutic options have failed.

Why are CPE a concern?

Enterobacteriaceae which are resistant to carbapenems due to the production of carbapenemases pose a significant threat to the successful treatment of Enterobacteriaceae infections. CPE are usually resistant to most other antibiotic classes, for example, all penicillin type antibiotics, ciprofloxacin, gentamicin and others. This leaves very few and sometimes no options for antibiotic treatment.

The way in which CPE bacteria are resistant to carbapenem antibiotics can be spread to other bacteria, making them resistant to these antibiotics too.

Due to the lack of new antibiotics under development, carbapenems may be regarded as drugs that should only be used as a last resort, and a critically important group of agents whose effectiveness must be preserved.

How common are CPE?

Over the last decade CPE have spread throughout the world and are now endemic (regularly found) in healthcare facilities in many countries. Until recently, most cases in the UK were in people who had been in hospital abroad. However, the number of cases of CPE is increasing and there are already areas in the UK where CPE can be considered endemic. There is a real risk that CPE could become endemic across Scottish healthcare.

How is CPE spread?

CPE is spread through direct contact with the patient or indirectly from the patient's immediate care environment (including care equipment). Consistently applying Standard Infection Control Precautions (SICPs) and Transmission-Based Precautions (TBPs), specifically contact TBPs, is required to prevent the spread of CPE.

Information about CPE screening

Why are patients screened for CPE?

By identifying patients who are colonised with CPE or who have a high risk of colonisation, we can make sure that they receive the most appropriate care and prevent the spread of CPE to others. It is also very important to know that someone is colonised with CPE so that should an infection develop, the best antibiotic to treat the infection is identified quickly.

How are patients screened for CPE in Scotland?

CPE screening has two steps. The first step is an initial clinical risk assessment (CRA) screen that identifies patients at high risk of CPE colonisation. In the second step, high risk patients identified by the CRA proceed to a screening test (microbiological testing) for CPE.

All patients admitted to acute hospitals in Scotland should have a risk assessment when they are admitted to find out if they are at high risk of carrying CPE. The following patients are considered to be at high risk of CPE colonisation:

1. Patients who have been an inpatient outside of Scotland in the last 12 months
2. Patients who have received holiday dialysis outside of Scotland in the last 12 months
3. Patients who have been in close contact with someone who has been colonised or infected with CPE in the last 12 months

Note: if a patient has ever been identified as colonised or infected with CPE, they should be managed as a confirmed case.

What happens if a patient is identified as high risk based on the CRA answers?

Patients who are identified as being at high risk of CPE colonisation or infection (because they meet one or more of the CRA criteria above) should go on to have test-based CPE screening (explained in the next section).

Patients who are identified as high risk **should be managed as if CPE positive** and should be isolated in a single room, preferably with en-suite facilities, until the result of the test is known. It is essential to consistently apply SICPs and contact TBPs as set out in the National Infection Prevention and Control Manual.

How should a sample be taken for testing?

A rectal swab should be taken using a routine bacteriology swab by inserting the swab into the rectum and rotating it gently. The swab should then be put back into the transport medium container and sent to the microbiology laboratory for testing.

If it is not possible to take a rectal swab, a stool sample can be collected instead. The stool sample should be collected in the same way as for routine culture.

Patients with wounds or lesions should also have these swabbed and patients with a urinary catheter should have a catheter specimen of urine sent for testing. A patient information leaflet is available to provide your patient with more information about CPE screening. This leaflet is available in other languages, as well as large print, easy read and Braille (English only).

Managing patients with CPE infection or colonisation

How should a patient who is colonised with CPE or has a CPE infection be managed?

SICPs and contact TBPs in line with Scotland's National Infection Prevention and Control Manual should be consistently applied.

A checklist in the Toolkit for the early detection, management and control of carbapenemase-producing Enterobacteriaceae in Scottish acute settings provides details of the measures needed to prevent and control infection.

Patients colonised with CPE or with a CPE infection should remain in isolation and be screened weekly. However, if the circumstances justify it (for example, for the patient's well-being), the Infection Prevention and Control Team may carry out a local risk assessment to decide whether the patient can be removed from isolation.

Patients who are colonised with CPE do not need to be treated. However, if an infection caused by CPE develops, antimicrobial treatment will be required.

Should contacts of new patient cases of CPE be screened?

If a patient with CPE has spent time in an open ward or bay, anyone who has been in contact with them should be screened. Screening is not normally necessary if a patient with CPE was identified and isolated when they were first admitted to hospital.

Further information

You can get more advice from the local Infection Prevention and Control team.

You can get more information from the following document:

Toolkit for the early detection, management and control of carbapenemase-producing Enterobacteriaceae in Scottish acute settings, available from http://www.hps.scot.nhs.uk/haiic/amr/publicationsdetail.aspx?id=55186.

Health Protection Scotland
Meridian Court, 5 Cadogan Street, Glasgow G2 6QE
Phone: 0141 300 1100