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| Carbapenemase-producing *Enterobacteriaceae* (CPE) |
| Information for clinicians |

Carbapenems are a group of penicillin-related (broad spectrum beta-lactam) antibiotics that are effective against most Gram negative infections.1 They are the last line of treatment for serious infections caused by multi-resistant *E. coli*, *Klebsiella* species and other *Enterobacteriaceae*.

Gram-negative bacteria are now emerging that produce the enzyme, carbapenemase, making most types of antibiotics ineffective, including carbapenems. This group of bacteria are known as carbapenemase-producing *Enterobacteriaceae* (CPE).

CPE are resistant to all beta-lactam antibiotics, including penicillins, cephalosporins and carbapenems. They are also resistant to most aminoglycosides and fluoroquinolones.

CPE increase the risk of potentially untreatable infections in patients following invasive procedures or other hospital care. CPE infections are associated with a much higher mortality than infections with otherwise similar non-CPE bacteria.

The duration of CPE carriage is variable and may be longer than 6 months in around 20% of people. Anyone ever identified with CPE carriage must, however, be considered at risk and undergo screening and isolation in hospital.

## CPE in Australia: Who is at risk?

Australia has not seen a significant number of CPE cases to date, due in part to our geographic isolation. However, the risk of CPE spreading to Australia is significant enough that it is recognised as an emerging public health issue.

International travel to affected areas (such as Greece, India and South-East Asia) creates an increased risk of spread of CPE to Australia. Exposure to healthcare services or residential care in these areas is a particularly significant risk factor for CPE colonisation.

Carbapenem antibiotics include: Meropenem, Imipenem, Ertapenem.

Travellers to CPE endemic regions may acquire CPE or other resistant bacteria from food, water or environmental sources and, as a result, extra care should be taken by travellers. Healthy people do not usually get CPE infections, so don’t usually become sick. However, it is important to know that people may carry CPE in their bowel or in a wound, without symptoms. These individuals who carry CPE are at risk of getting a CPE infection if they have an operation, especially on the prostate.

CPE are more likely to affect patients who have:

* A hospital stay within the previous 12 months in an area with documented or suspected CPE
* A prolonged hospital stay
* Multiple or recent exposures to different antibiotic agents, especially cephalosporins, fluoroquinolones and carbapenems
* Diabetes mellitus
* An indwelling medical device, such as a central venous catheter, urinary catheter, biliary catheter or wound drain
* An organ or stem-cell transplant
* Admission to the intensive care unit
* Mechanical ventilation
	+ Poor functional status

## Controlling CPE in healthcare

Early detection of CPE through targeted patient screening is essential to enable containment.

If you are referring a patient with known CPE (infection or carriage) to hospital, including outpatients / consultant rooms or the Emergency Department, ***please make sure you inform the hospital***. An example of a transfer letter for residents with CPE can be [downloaded from the department’s website](https://www2.health.vic.gov.au/infection-control) <https://www2.health.vic.gov.au/infection-control>.

Infection prevention and control measures, including isolation or cohorting measures are of proven value for limiting the spread and impact of CPE in healthcare settings. Antimicrobial stewardship at all levels of the health service is critical for reducing risk.

The use of standard and contact precautions reduces the risk of transmission between patients.

Infection control precautions for patients with CPE, that is, single room and contact precautions, **must be instituted every time** they are admitted to a health care facility and maintained until discharge (even if screening specimens taken are negative for CPE). A case of CPE, whether colonised or infected, can excrete CPE intermittently for many months and in some cases for over 18 months. As a result, the current *Victorian Guideline on CPE for health services* states: “once a person is identified as a case of CPE, they should be considered potentially infectious indefinitely”.

1. The most common and important gram negative pathogens are the *Enterobacteriaceae*, represented particularly by *Escherichia coli* and *Klebsiella/ Enterobacter* spp.

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