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| Carbapenemase-producing organisms (CPO) |
| Information for clinicians |
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## What are carbapenemase-producing organisms (CPO)?

The term CPO is used to refer collectively to bacteria that have acquired resistance to carbapenems. These bacteria include carbapenemase-producing Enterobacterales (CPE), carbapenemase-producing *Acinetobacter* spp. (CPA). and carbapenemase-producing *Pseudomonas* spp. (CPP).

Carbapenems are a group of penicillin-related (broad spectrum beta-lactam) antibiotics that are effective against most Gram-negative bacteria. Carbapenem antibiotics include: meropenem, imipenem, ertapenem. They are the last line of treatment for serious infections caused by multi-resistant *E. coli*, *Klebsiella* spp., *Acinetobacter* spp. and *Pseudomonas* spp.

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

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

## CPO in Australia: Who is at risk?

The general burden of CPO in Australia is lower than that observed in some areas of Europe, North America, the Middle East, and Asia. This is attributed to the regulation of antimicrobial usage in Australia and geographical isolation. Prior to 2012, identification of CPO in Victoria was limited to patients with recent overseas hospitalisation in high burden countries or long-term hospitalisation within Australia. Currently, the risk of CPO spreading to Australia is recognised as a significant emerging public health issue and CPO have been made notifiable in Victoria.

Travel to CPO endemic areas creates an increased risk of acquiring a CPO. Exposure to healthcare services in these areas is a particularly significant risk factor for CPO colonisation. Travellers to CPO endemic regions may acquire CPO or other resistant bacteria when receiving medical care, as well as from food, water, or environmental sources.

Healthy people do not usually get CPO infections, so don’t usually become sick. However, it is important to know that people may carry CPO in their bowel or in a wound, without symptoms. These individuals who carry CPO are at risk of getting a CPO infection if they have surgery or other invasive procedures.

### Factors contributing to a higher-risk of acquiring a CPO

* A hospital stay within the previous 12 months in an area with documented or suspected CPO
* 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 an intensive care unit
* Mechanical ventilation
* Poor functional status

## Controlling CPO in health care

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

If you are referring a patient with known CPO (infection or colonisation) 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 CPO can be downloaded from the [department’s website](http://www.health.vic.gov.au/infection-control) <www.health.vic.gov.au/infection-control>.

Infection prevention and control (IPC) measures, including isolation or cohorting measures are of proven value for limiting the spread and impact of CPO in healthcare settings. In addition, antimicrobial stewardship at all levels of the health care is critical for reducing risk.

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

For patients with a history of CPO, a risk assessment should be undertaken at each presentation to determine the need for additional IPC precautions and take into account the type of CPO, as well as individual risk factors, the type of ward they are admitted to and planned clinical management.

* Most CPE patients remain colonised for at least 6 to 12 months and some considerably longer, particularly with ongoing or repeated healthcare contact and/or antibiotic use. A patient with positive CPE results in the previous 12 months must remain in contact precautions. If the last positive result is more than 12 months ago, screening should be done to determine whether the patient has detectable levels of CPE present.
* Patients with a history of CPA or CPP may not require additional IPC precautions at each admission. The risk assessment to support decisions regarding additional IPC measures should consider factors such as which ward or unit they are to be admitted to (for example, admission to ICU would be a high risk with previously colonised CPA patient), reason for admission (for example, treatment of a current infection) or other patient risk factors (for example, chronic respiratory condition and colonised with CPP in the past).

If additional IPC measures are warranted after a risk assessment, these should be instituted and maintained until the patient is discharged.

If a patient known to be colonised or infected with a CPO requires antibiotic treatment or prophylaxis, you should consult an infectious diseases physician for advice regarding appropriate antibiotics to use.

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