



CPE: Summary for health service organisations

Background

This resource provides a summary of the key aspects of the *Recommendations for the control of carbapenemase-producing Enterobacterales - A guide for acute care health service organisations (2021 CPE Guide)* to assist health service organisations to respond to CPE.

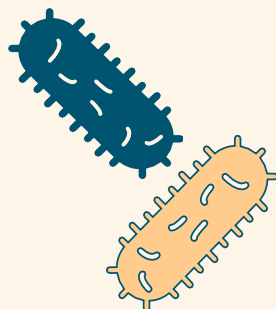
Your health service organisation may have developed local policies and protocols with more specific procedures to follow. Some states and territories have policies on notification of single cases, or transmission between patients. The 2021 CPE Guide should be used in conjunction with these policies and protocols.

*Enterobacterales** are a large group of gram-negative bacteria that include *Escherichia coli*, *Klebsiella pneumoniae*, *Enterobacter cloacae* and *Proteus mirabilis*. *Enterobacterales* are part of the normal flora of the human gastrointestinal tract and are generally not harmful. An infection may occur when these bacteria move to other parts of the body, such as the urinary tract or wounds, and cause the person to become unwell.

Carbapenems are a group of broad-spectrum β -lactam antibacterials that are effective in treating many infections, including those caused by gram-positive and gram-negative bacteria. Carbapenems include meropenem, imipenem, and ertapenem and are used as treatment for serious infections caused by *Enterobacterales*. Carbapenemase-producing *Enterobacterales* (CPE) refer to specific *Enterobacterales* that produce enzymes that make carbapenems ineffective.

Bacteria that are resistant to many antibacterials, such as CPE, have emerged as a significant global public health threat because there is a real risk of not having an effective antibacterial treatment available to treat patients infected with these bacteria.

* Taxonomic studies have narrowed the definition of the family *Enterobacteriaceae*. Some previous members of this family are now included in other families within the order *Enterobacterales*.



The Australian Commission on Safety and Quality in Health Care published the **2021 CPE Guide** to support acute health service organisations in preventing and controlling the spread of CPE and meeting the requirements of the **National Safety and Quality Health Service Standards**. Health service organisations should consider the recommendations in the **2021 CPE Guide**, in conjunction with the **Australian Guidelines for the Prevention and Control of Infection in Healthcare**, relevant local policies and procedures, and advice from the local infection control service.

Why is preventing and controlling CPE important?

CPE can cause a range of common infections, including urinary tract and bloodstream infections, and can result in prolonged hospitalisation, morbidity and mortality.

Infections caused by CPE can be difficult to treat as these bacteria produce enzymes that inactivate most of the available β -lactam antibacterials, and often harbour resistance to other antibacterial classes. The few antibacterials that are effective against CPE can have adverse effects for patients.

CPE spread easily between people because they have resistance genes that can readily move between different strains and species of bacteria.

Vulnerable patients with co-morbidities are at increased risk of developing a CPE infection. CPE are more likely to affect patients such as those in intensive care or who are receiving chemotherapy.

The 2021 CPE Guide provides information across the following five domains:

Section 1. Planning, preparing and prevention

This section outlines the recommended minimum requirements for planning and preparing for CPE by health service organisations where no cases of CPE have been identified. Strategies include effective governance and management, standard precautions, staff education, antimicrobial stewardship and outbreak planning.

Section 2. CPE screening and surveillance

This section outlines the recommended minimum requirements for surveillance in health service organisations to ensure patients with CPE and their contacts are identified. Guidance is also provided on the timing and frequency of screening, CPE clearance, and environmental screening.

Section 3. Strategies to reduce CPE transmission

This section provides recommendations for health service organisations to manage a small number of CPE cases that are not epidemiologically linked, or where limited local transmission is occurring. Recommendations in this section address the management of CPE-positive patients, CPE contacts, patient movement, cleaning and disinfection and other environmental controls.

Section 4. Outbreak management

This section provides recommendations for health service organisations to manage an outbreak of CPE with widespread transmission and cases that may be epidemiologically linked. Also included in this section are recommendations for identification of an outbreak, contact tracing, staffing considerations, cleaning and disinfection.

Section 5. Laboratory screening and methods

This section addresses laboratory procedures for screening patient specimens, or cultures, for CPE and provides advice and recommendations on the detection of CPE for all medical diagnostic laboratories in Australia.

CPE and whole genome sequencing

Whole genome sequencing (WGS) is playing an increasing role in tracking outbreaks of CPE. WGS is used to confirm true clusters of cases and to link CPE cases that may not have appeared to be initially linked. As WGS results are not immediately available, WGS should be used to supplement routine susceptibility testing and confirmatory molecular screening of CPE genes.

What do health services organisations need to do?

The 2021 CPE Guide provides a number of recommendations that promote patient safety, and support health service organisations in meeting the requirements of the National Safety and Quality Health Service (NSQHS) Standards, specifically the Clinical Governance and Preventing and Controlling Infection Standards^{1,2}, and the **Australian Guidelines for the Prevention and Control of Infection in Healthcare**.

All health service organisations should have an effective infection prevention and control program and outbreak management plan that includes strategies to prevent and control the spread of CPE. Coordinated outbreak management plans have been shown to be effective in the control of an outbreak of CPE.³⁻⁶ An organisation's outbreak management plan should involve all areas of the hospital and be developed in consultation with the organisation's infection prevention and control and antimicrobial stewardship committees and experts in infection prevention and control, microbiology, pharmacy and infectious diseases specialists.

To minimise the CPE risk to patients and the health workforce, health service organisations should ensure the following recommendations from the **2021 CPE Guide** are considered:

- Appropriate governance and effective infection, prevention and control precautions, environmental cleaning, and antimicrobial stewardship programs
- Systems for patient screening, including a process to screen and identify patients at high risk for CPE carriage on admission to the health facility
- Systems to detect and manage clusters, or outbreaks, of CPE, including:
 - Access to a laboratory that can provide accurate testing and timely turnaround of results
 - Epidemiological evaluation of every new CPE case to identify the likely source of acquisition and determine the need for further patient screening.
- An alert system to identify colonised or infected patients to ensure precautions are in place for subsequent admissions.
- Education for staff of the health service organisation on how to respond to cases of CPE.

What strategies should be used to prevent the transmission of CPE?

A combination of **standard** and **contact** precautions should be used when caring for patients with a CPE infection or a history of CPE colonisation, for at least the duration of the initial episode of inpatient care.

Standard precautions include hand hygiene, use of personal protective equipment (PPE) and effective cleaning of all equipment and the healthcare environment. Standard precautions should be used for all patients, regardless of their infection status.

Contact precautions include placement in a single room, use of personal protective equipment (gloves and gowns), dedicating equipment to patients, where possible and enhanced cleaning and disinfection in selected instances. Contact precautions should be used:

- When patients are colonised with CPE
- When patients are identified as being at high-risk of colonisation with CPE
- When patients are waiting for the results of screening swabs.

Where single rooms are not available, other options for patient placement should be discussed with the infection control service.

Antimicrobial stewardship

The optimal use of antibacterials is critically important to reduce the spread of CPE.

All control strategies should include antimicrobial stewardship (AMS) measures to minimise inappropriate antimicrobial prescribing, and ensure that key antibacterial agents, such as cephalosporins, fluoroquinolones and carbapenems, are only used when necessary.

It is essential that all clinicians ensure prescribing, and use, is consistent with the current version of **Therapeutic Guidelines: Antibiotic**⁷ and local susceptibility information. Specialised infectious diseases, microbiology, pharmacy and AMS input is required to care for patients infected or colonised with CPE.

Environmental cleaning

Environmental cleaning is a key strategy for decreasing the spread of all pathogens in the healthcare environment. Each health service organisation should maintain a clean environment, consistent with the requirements of the NSQHS Standards, national guidelines and state or territory policies, regardless of patient infection status.

Recommendations for cleaning and disinfection where patients are suspected or confirmed CPE cases are in Section 3.4 of the **2021 CPE Guide**. These recommendations are consistent with information on environmental cleaning in the **Australian Guidelines for the Prevention and Control of Infection in Healthcare**. A number of resources to support effective environmental cleaning are available on the **Commission's website**.

References

1. Australian Commission on Safety and Quality in Health Care. National Safety and Quality Health Service Standards. Clinical Governance Standard. Sydney: ACSQHC, 2017.
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3. Schwaber MJ, Lev B, Israeli A, Solter E, Smollan G, Rubinovitch B, et al. Containment of a country-wide outbreak of carbapenem-resistant *Klebsiella pneumoniae* in Israeli hospitals via a nationally implemented intervention. *Clin Infect Dis*. 2011;52(7):848–855.
4. Magiorakos AP, Burns K, Rodriguez Bano J, Borg M, Daikos G, Dumpis U, et al. Infection prevention and control measures and tools for the prevention of entry of carbapenem-resistant Enterobacteriaceae into healthcare settings: guidance from the European Centre for Disease Prevention and Control. *Antimicrob Resist Infect Control*. 2017;6(1):113
5. Delory T, Seringe E, Antonioti G, Novakova I, Goulenok C, Paysant I, et al. Prolonged delay for controlling KPC-2-producing *Klebsiella pneumoniae* outbreak: the role of clinical management. *Am J Infect Control*. 2015;43(10):1070–1075.
6. Coope CM, Verlander NQ, Schneider A, Hopkins S, Welfare W, Johnson AP, et al. An evaluation of a toolkit for the early detection, management, and control of carbapenemase-producing Enterobacteriaceae: a survey of acute hospital trusts in England. *J Hosp Infect*. 2018;99(4):381–389
7. Therapeutic Guidelines Antibiotic Expert Group. *Therapeutic Guidelines: Antibiotic*. Version 16. Melbourne: Therapeutic Guidelines Limited; 2019.



For more information about the Commission's work on CPE prevention and management, and to download your copy of the **CPE Guide**, please visit: www.safetyandquality.gov.au/cpe-guide