**Title:** Infection Prevention and Control Procedures for Carbapenemase-Producing Enterobacteriaceae: Clinical Effectiveness and Guidelines

**Date:** 13 August 2014

**Research Questions**

1. What is the clinical effectiveness of procedures for screening patients for carbapenemase-producing Enterobacteriaceae (CPE)/carbapenemase-resistant Enterobacteriaceae (CRE)?

2. What is the clinical effectiveness of interventions for the prevention of transmission of CPE/CRE organisms?

3. What is the clinical effectiveness of contact management procedures for individuals exposed to patients determined to be carrying CPE/CRE organisms?

4. What are the evidence-based guidelines regarding the reassessment of patients who are positive for CPE?

5. What are the evidence-based guidelines regarding infection prevention and control procedures for CPE/CRE?

**Key Findings**

One systematic review, one randomized control trial, and 13 non-randomized studies regarding infection prevention and control procedures for carbapenemase-producing Enterobacteriaceae (CPE) were identified.

**Methods**

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2014, Issue 7), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. Methodological filters were applied to limit retrieval to health technology.

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assessments, systematic reviews, meta-analyses, randomized controlled trials, randomized controlled trials, non-randomized studies, and guidelines. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2009 and July 31, 2014. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines.

One systematic review was identified regarding infection prevention and control procedures for CPE. One randomized control trial was identified regarding patient decolonization. Thirteen non-randomized studies were identified. No health technology assessments or evidence-based guidelines were identified.

Additional references of potential interest are provided in the appendix.

OVERALL SUMMARY OF FINDINGS

In the identified systematic review, screening of patients admitted from health care facilities in another country for CPE was recommended. The systematic review and two non-randomized studies suggested surveillance cultures upon admission to hospital. Active surveillance and screening for patients who travelled abroad was also reported from three non-randomized studies. In one non-randomized study, an active screening program of hospitalized patients was found to be effective for detecting CPE and other multi-drug resistant pathogens.

Rectal screening was performed as a means of early identification of patients with CPE in one non-randomized study. Another non-randomized study found that culturing samples from more than one anatomical site, including skin, was necessary for detecting all CPE colonized patients.

One randomized control trial identified selective digestive decontamination, through the use of an antimicrobial regimen, as a possible means for infection containment for outbreaks of carbapenemase-producing *Klebsiella pneumoniae*. Procedures outlined in the Centers for Disease Control and Prevention’s CRE toolkit were identified as effective in reducing the incidence of CRE.

Additionally, the following were identified as methods for controlling the transmission of CPE:

- patient and contact screening
- strict infection control procedures
- improved laboratory detection
- antibiotic stewardship rounds
• active surveillance\textsuperscript{1,13-15}
• enhanced environmental cleaning\textsuperscript{15}
• personnel training\textsuperscript{15}
• patient isolation procedures\textsuperscript{14,15}
• 2\% chlorhexidine gluconate baths for patients\textsuperscript{15}
• and hand hygiene compliance\textsuperscript{14}

The findings of the systematic review suggest precautions should be taken in caring for patients with CPE, including the use of disposable gloves and gowns, and nursing by a dedicated and separate team\textsuperscript{1}. Screening case contacts for carbapenemase-producing \textit{K. pneumoniae} was identified as an essential component for detecting carriers, though the value of this screening may depend on CPE frequency among patients entering hospital\textsuperscript{8}. No evidence-based guidelines regarding the reassessment of CPE positive patients were identified. One study determined four consecutive negative stool samples or rectal swabs to be sufficient in declaring CPE decolonization in patients, provided the tests were conducted 48 hours apart\textsuperscript{8}. No evidence-based guidelines for infection prevention and control procedures for CPE were identified.
REFERENCES SUMMARIZED

Health Technology Assessments
No literature identified.

Systematic Reviews and Meta-analyses

   Section 6.5 and 6.6, page 26,
   Section 8.3, Active screening of patients, page 31,
   Section 9.1.3, page 32, and
   Section 9.2.2, page 33

Randomized Controlled Trials


Non-Randomized Studies


Guidelines and Recommendations
No literature identified.

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APPENDIX – FURTHER INFORMATION:

Guidelines and Recommendations – Unclear Methodology


Additional References


