

Open Book

Learning from close calls and adverse events

Transmission of 'super-bug' in hospital

This report alerts providers to key findings and actions following review of an outbreak of a multi-drug resistant organism (MDRO) which affected five patients. The aim is to learn from the changes implemented after the event to prevent future similar events.

We advise providers to consider this report, and whether the changes and recommendations might apply to their own systems.

This report is relevant to:

- infection prevention and control (IPC) professionals
- clinical staff
- bed management and hospital managers
- public health staff
- quality improvement, clinical risk and patient safety managers.

Incident

Five patients were found to be colonised with a carbapenem-resistant enterobacteriaceae (CRE) MDRO following cross-transmission in hospital.

Chronology

- A patient with a neurological condition (index patient) was admitted directly from an overseas hospital through medical repatriation.
- The referring hospital knew the patient was colonised with CRE. This information was included in the discharge summary on the fourth page – not at the front where relevant current medical issues were documented. The referring manager also emailed this information to the receiving hospital, but the message was delayed due to there being a typographical error in the email address.
- The patient was admitted via the emergency department. Due to staff workload issues, a trainee intern undertook the initial assessment. The intern read but did not understand the significance of the information regarding CRE.
- Additional medical assessments by more senior staff were focused on the patient's neurological condition. The CRE information was overlooked.
- The patient was transferred into a single room in a low acuity ward without contact precautions. The ward coordinator was told the patient had to be in a single room, and that the infection prevention and control (IPC) team needed to be informed in the morning. This staff member was unfamiliar with the acronym CRE and its implications. Because the admission occurred near a shift-change, the admission process was not completed before handover. The need to liaise with IPC was omitted from handover documentation.
- The patient became unstable and was transferred to a multi-bed close observation room.
- Two weeks later, CRE was identified in a urine test for a different patient who had no associated risk factors for acquisition of CRE. An investigation started, including screening patients who had shared the same room. Three further patients were identified as being colonised with CRE during this process, including the index patient.

- An outbreak was declared, and an outbreak management process put in place. All colonised patients were immediately isolated. A system was established for managing other patients and staff.
- A further two patients were found to be colonised with CRE, but once the outbreak was identified and processes put in place to prevent further spread there was no further cross-transmission.

Review

- The IPC standard procedure for management of MDROs was not followed fully. As a result, the index patient was not identified as high risk and screened for MDRO.
- Staff could not easily access IPC policies.
- Communication regarding the patients' CRE status was not recognised as significant and therefore relevant referrals were not made to the IPC service.
- The use of the abbreviation CRE created confusion. The abbreviation is not well known in New Zealand as it is an emerging MDRO. There is no New Zealand guideline for managing MDROs. CREs are recognised internationally as a major threat, however, and outbreaks in overseas hospitals are well described.
- Once identified, the CRE outbreak was well managed and support provided at all levels of the organisation.
- There was no CRE transmission in the ward outside the index patient's room.

Definitions

MDRO

MDROs are defined as microorganisms, predominantly bacteria, resistant to one or more classes of antimicrobial agents. These organisms deserve special attention in health care facilities.¹

More commonly known organisms in New Zealand include MRSA (methicillin-resistant *Staphylococcus aureus*) and ESBL (extended spectrum beta-lactamases).

CRE

CREs are a family of bacteria that are difficult to treat because they have high levels of resistance to antibiotics. *Klebsiella* species and *Escherichia coli* (*E. coli*) are examples of enterobacteriaceae, a normal part of human gut and urinary tract bacteria.

Actions taken

- Guidance was strengthened on patient screening and liaison with the IPC service for patients who have been in an overseas hospital in the last 12 months.
- The process for letting the IPC service know about arranged transfers of overseas patients was reviewed and improved.
- Bedside staff have better access to IPC procedures.
- An internal review of processes was undertaken by the provider to check the robustness of outbreak processes, procedures and communication.
- The event was highlighted with the Ministry of Health Healthcare Associated Infections Governance Group and Communicable Diseases team.

¹ www.cdc.gov/hicpac/mdro/mdro_2.html

Health Quality & Safety Commission comment

- Organisational resilience factors in subsequent IPC actions effectively contained and resolved the outbreak once identified.
- Early communication with the Ministry of Health encouraged national awareness and support in a transparent review process.
- In this incident, human factors led to a serious MDRO being missed and transmitted to other patients. Standard operating procedures were in place, but not followed. Human factors influences on this event included communication breakdown at handover of care, lack of awareness of the system for managing IPC policies and failure to recognise a serious MDRO.
- The IPC component of the admission process should be fully integrated with other clinical and administrative requirements for safe transfer of care.
- Acronyms and abbreviations are not always understood across different specialties involved in a patient's journey through the health care system. We discourage the use of acronyms and abbreviations in documentation because it can stop critical information from being understood. See our previous Open Book report, '[Delay due to the use of an unfamiliar acronym](#)'.
- We commend the provider involved for sharing this challenging case for the benefit of national learning.