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AT A GLANCE

CPE Transmission Risk Factors in Long-Term Care Homes

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Introduction

Long-term care homes (LTCH) experience unique issues when caring for residents that are infected or colonized with an antibiotic-resistant organism, such as Carbapenemase-producing *Enterobacteriaceae* (CPE).

Health care providers must balance infection prevention and control (IPAC) with the quality of care and life of the resident.[1] To do this, health care providers must understand the potential risk of transmission of CPE from a colonized or infected resident to another resident, staff member, or visitor.

This document provides information to help identify which residents with CPE are at lower or higher risk for spreading CPE to others. In general, when the risk of spreading CPE is higher, LTCHs should be more restrictive with IPAC practices. As each LTCH and resident is unique, LTCHs, resident, and staff factors should be taken into account when identifying the risk and any resulting IPAC practices.

This document highlights key factors for LTCHs to consider when making decisions about the restrictiveness of IPAC practices to implement when a resident has CPE.

Factors that Influence the Risk of CPE Transmission

Long-Term Care Home Design and Infrastructure

Spreading of germs that can cause infection may be affected by the physical characteristics of the LTCH, including the number of private rooms to shared rooms, and the size of shared spaces. These factors can affect the risk of spreading CPE by affecting how well the LTCH can minimize direct contact between residents or items and surfaces contaminated with CPE.

If many of the below factors fall into the medium or higher-risk category, more restrictive strategies should be used to reduce the risk of spreading CPE. These strategies may include: increased cleaning and disinfection of rooms, washrooms, showers, and shared areas; dedicating time slots for use of the shower; education on hand hygiene and avoiding direct contact; and ensuring there is enough space in the area where residents/staff come together to minimize the opportunity for contact.

Table 1: Physical Design and Infrastructure Key Factors that Impact the Risk of CPE Transmission in LTCHs

Factor	Lower Risk	Medium Risk	Higher Risk
Resident room	Resident has a private room.	Resident has a single roommate.	Resident has multiple roommates.
Washrooms	A washroom can be dedicated to the resident.	Resident shares a washroom with a roommate but is able to maintain a clean environment and good hygiene.	Resident shares a washroom with other residents. Resident unable to maintain a clean washroom.
Shower rooms	A shower can be dedicated to the resident.	Resident shares shower with other residents, but the shower is cleaned by housekeeping staff following use by the resident.	Resident shares shower with other residents, and housekeeping is unable to identify and clean and disinfect the shower after the resident uses it.
Shared spaces	Large, open areas that provide enough space to avoid direct contact.	Small spaces that can be used by a small number of residents while still maintaining physical distancing. Areas can be supervised to ensure physical distancing is maintained.	Tight, cramped spaces where physical distancing is difficult. Unable to supervise shared spaces.

Resident Characteristics

There are many key factors related to residents in long-term care homes that can increase the risk for spreading CPE or getting a CPE infection. These include factors of the resident with CPE, as well as other residents at the home. Resident factors may increase the risk of spreading CPE and infection through increased routes for transmission (e.g., open wounds), low ability to fight off infections (e.g., poorer immune systems from heart disease, diabetes, or very old age), or a decreased ability to make safe decisions (e.g., dementia).

The greater the number of higher risk factors present as outlined below, the more restrictive strategies should be used to reduce the risk of spreading CPE. Some of these strategies could be: restricting shared activities/dining to the resident with CPE or those who are unable to follow instructions; supervision for the resident when they are out of their room; keeping doors closed to limit access; and increased cleaning and disinfection of high-touch surfaces.

Table 2: Resident Key Factors that Impact the Risk of CPE Transmission in LTCHs

Factor	Lower Risk	Higher Risk
Hygiene	Resident capable of maintaining hand hygiene and personal hygiene (e.g., regular bathing, wearing clean clothing when in shared spaces). Roommates capable of maintaining hand hygiene and personal hygiene. The resident and roommate have separate personal hygiene products.	Resident unable or unwilling to maintain hand hygiene and personal hygiene.
Resident Health	The resident does not have any exposed, or uncontained draining wounds.	The resident has exposed, or uncontained draining wounds.
Roommate Health	Roommates do not have indwelling devices (e.g., urinary catheter, PICC, central line, PEG tube, etc.) or exposed wounds. Roommates are not immunocompromised (e.g., comorbidities such as diabetes, or taking immune-compromising medication).	Roommates have indwelling devices (e.g., urinary catheter, PICC, central line, PEG tube, etc.) or exposed wounds. Roommates are immunocompromised (e.g., comorbidities such as diabetes, or taking immune-compromising medication).
Continence Status	Resident is continent of urine and stool.	Resident is incontinent of urine and stool.
Cognitive Status	Resident is able to understand and comply with instructions (e.g, how to properly wash their hands, not sharing personal items or food, avoid touching other residents).	Resident is unable to understand and comply with instruction. Resident has a high risk of wandering or other behavioural challenges

Factor	Lower Risk	Higher Risk
Other resident characteristics	Other residents are able to understand and comply with instructions (e.g, how to properly wash their hands, not sharing personal items or food, avoid touching other residents).	Other residents unable to understand and comply with instructions. Other residents have a high risk of wandering or other behavioural challenges

IPAC Program Characteristics

There are key factors of LTCH IPAC programs that can impact the risk of spreading CPE. These factors focus on the level of IPAC resources, including IPAC education and training and support for the implementation of IPAC best practices at the home. Establishing strong environmental cleaning, hand hygiene and IPAC education and training programs will lead to IPAC practices that can help reduce the spread of CPE.

The greater the number of higher risk factors present as outlined below, the more restrictive strategies should be used to reduce the risk of spreading CPE. Strategies may include: increasing IPAC education and training of staff (including agency staff), residents, and visitors; and doing IPAC audits or increasing how often they are done (e.g., hand hygiene, environmental cleaning, and putting on and taking off personal protective equipment).

Table 3: IPAC Program Key Factors that Impact the Risk of CPE Transmission in LTCHs

Factor	Lower Risk	Higher Risk
Environmental services resources	• The LTCH has written cleaning and disinfection policies and procedures that are developed from best practice guidance.[2] • Environmental service workers (ESWs) are hired by the LTCH and dedicated to environmental cleaning. • ESWs receive regular education and training in infection prevention and control (IPAC). • Environmental cleaning audits are performed regularly (e.g., visual assessments, direct observation).[3] • There are adequate resources to follow cleaning and disinfection best practices.	• The LTCH does not have written cleaning and disinfection policies and procedures that are developed from best practice guidance.[1] • ESWs are hired through agencies on a contract basis. • ESWs do not receive regular, ongoing education and training in IPAC or there is uncertainty around the level of IPAC training they receive. • Environmental cleaning audits are not performed on a regular basis. • There is inadequate resources to follow cleaning and disinfection best practices.

Factor	Lower Risk	Higher Risk
Staff IPAC knowledge and training	• There is regular, ongoing education and training for staff in infection prevention control (e.g., point-of-care risk assessments, hand hygiene, putting on and taking off personal protective equipment [PPE]). • Staff are aware of what CPE is and the necessary IPAC practices to manage a case. • IPAC audits (e.g., environmental audits, hand hygiene audits, PPE audits)[4,5] have identified good compliance with IPAC best practices.	• There is no ongoing, regular IPAC education and training for staff. • Staff have no or limited understanding of what CPE is and the necessary IPAC practices to manage a case. • IPAC practice audits are not performed, or audits show low compliance with IPAC best practices.

References

1. Ontario Agency for Health Protection and Promotion (Public Health Ontario), Provincial Infectious Diseases Advisory Committee. Annex A – Screening, testing and surveillance for antibiotic-resistant organisms (AROs). Annexed to: Routine practices and additional precautions in all health care settings. Toronto, ON: Queen's Printer for Ontario; 2013. Available from: https://www.publichealthontario.ca/-/media/documents/a/2013/aros-screening-testing-surveillance.pdf

2. Ontario Agency for Health Protection and Promotion (Public Health Ontario), Provincial Infectious Diseases Advisory Committee. Best practices for environmental cleaning for prevention and control of infections in all health care settings. 3rd ed. Toronto, ON: Queen's Printer for Ontario; 2018. Available from: https://www.publichealthontario.ca/-/media/documents/b/2018/bp-environmental-cleaning.pdf

Additional Resources

3. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Implementing environmental marking audits for environmental cleaning in five steps [Internet]. Toronto, ON: King's Printer for Ontario; 2023 [cited 2023 Sep 27]. Available from: https://www.publichealthontario.ca/-/media/Documents/E/2023/ec/environmental-cleaning-implementing-environmental-marking-audits.pdf?rev=cd55db40a8fd4d129e9bb09de50282ce&sc_lang=en

4. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Just clean your hands – Long-term care [Internet]. Toronto, ON: Queen's Printer for Ontario; 2019 [cited 2023 Sep 27]. Available from: https://www.publichealthontario.ca/en/Health-Topics/Infection-Prevention-Control/Hand-Hygiene/JCYH-LTCH

5. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Implementing personal protective equipment audits in health care settings [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [cited 2023 Sep 27]. Available from: https://www.publichealthontario.ca/-/media/Documents/A/2021/aag-implementing-ppe-audit-health-care.pdf?rev=f021068b324c4bc895ab128d111acca4&sc_lang=en

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