

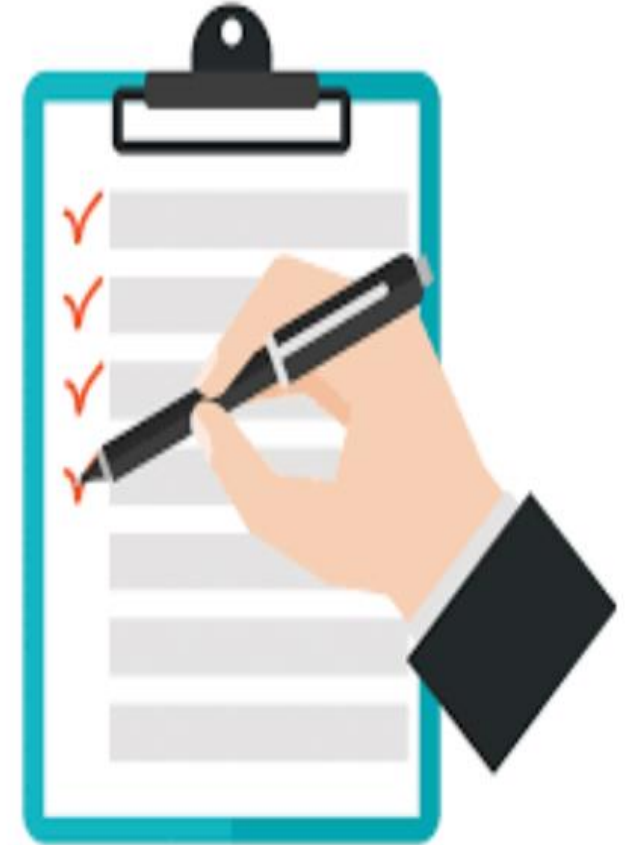
**LTC/RH CoP (Huddle)**  
**April 9, 2024**



# Agenda

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## 1. Carbapenem-Producing Enterobacteriaceae (CPE)



# Enterobacteriaceae

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- Enterobacteriaceae is a family of Gram-negative bacteria commonly found in the human gastrointestinal tract but can also lead to severe infections when they spread outside the GI tract.
- These infections can manifest as UTIs, bloodstream infections, wound infections, and pneumonia.
- The concern is the emergence of **C**arbapenem **R**esistant **E**nterobacteriaceae (CRE), a subset of multi-drug resistant organisms (MDROs).
- CRE achieve resistance through the production of enzymes known as carbapenemases, which render carbapenem antibiotics ineffective.
- **Carbapenem antibiotics, are often considered as the last line of defense against bacterial infections.**

# CRO, CPO, CRE, CPE

Carbapenem resistance among bacteria is a **serious concern in healthcare settings**, with different terms used to describe various aspects of this resistance:

## Carbapenem-Resistant Organisms (CRO):

- This term encompasses any organism that demonstrates resistance to carbapenem antibiotics, regardless of the specific mechanism involved.
- Resistance mechanisms may include the production of carbapenemases, increased expression of efflux systems, or reduced expression of porins.

# CRO, CPO, CRE, CPE

Carbapenem resistance among bacteria is a **serious concern in healthcare settings**, with different terms used to describe various aspects of this resistance:

CRO



## Carbapenem-Producing Organism (CPO):

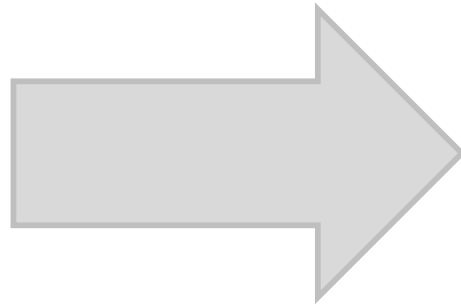
- This refers to any organism capable of producing carbapenemases, which are enzymes that confer resistance to carbapenem antibiotics.
- Can include members of the Enterobacteriaceae family, as well as other bacterial species such as Pseudomonas and Acinetobacter.

# CRO, CPO, CRE, CPE

Carbapenem resistance among bacteria is a **serious concern in healthcare settings**, with different terms used to describe various aspects of this resistance:

CRO

CPO



Carbapenem-Resistant Enterobacteriaceae (CRE):

- This term specifically applies to Enterobacteriaceae bacteria that exhibit resistance to carbapenem antibiotics, regardless of the underlying mechanism.
- Encompasses organisms that produce carbapenemases (CPEs) as well as those that are resistant through other mechanisms.

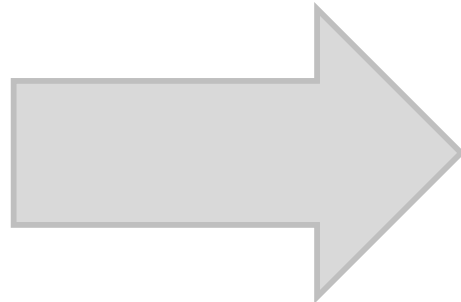
# CRO, CPO, CRE, CPE

Carbapenem resistance among bacteria is a **serious concern in healthcare settings**, with different terms used to describe various aspects of this resistance:

CRO

CPO

CRE

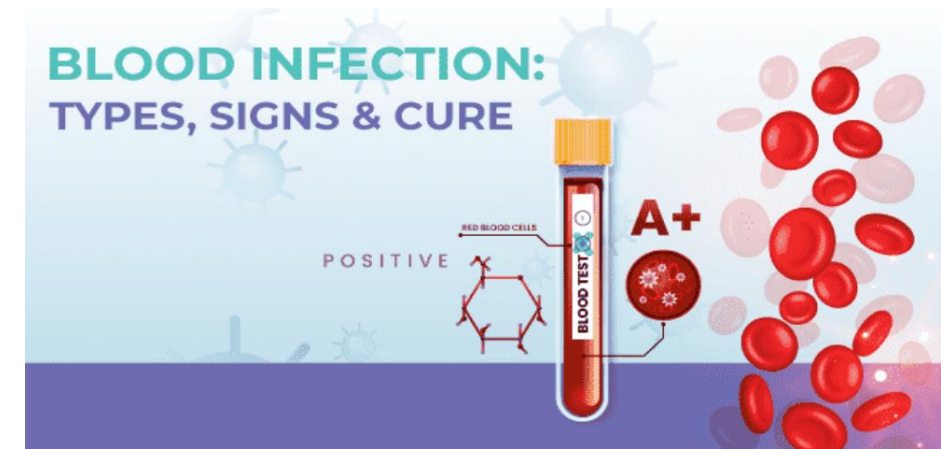
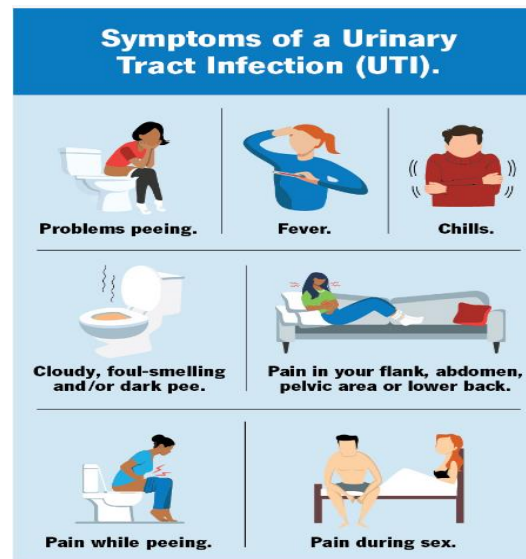
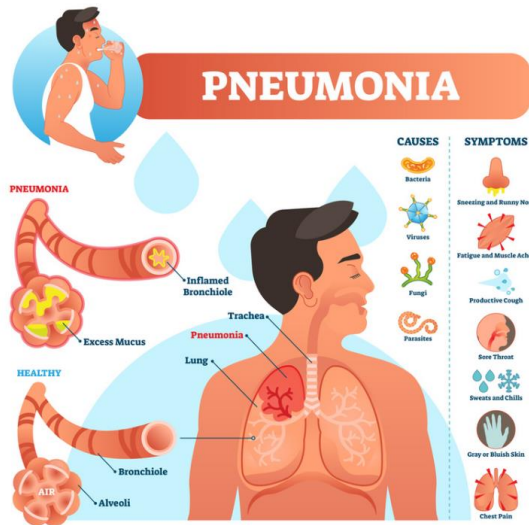


## Carbapenem-Producing Enterobacteriaceae (CPE):

- This subset of CRE specifically refers to Enterobacteriaceae bacteria that produce carbapenemases, which are enzymes capable of inactivating carbapenem antibiotics.
- CPEs are of particular concern due to their ability to rapidly spread and cause serious infections.
- In Ontario, only CPEs have been designated as a disease of public health significance.

# Infection vs. Colonization

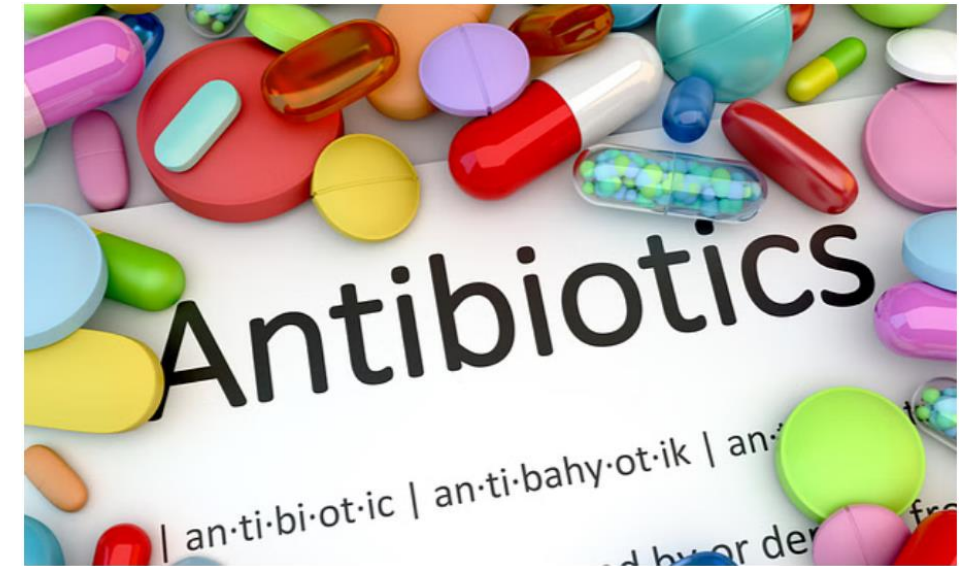
- A resident with CPE can either be infected or colonized.
- Infection:
  - The resident **exhibits signs and symptoms** of illness.
  - Residents with CPE infections **can transmit the bacteria to others** and **require treatment**.
  - Common infections include pneumonia, UTIs, and bloodstream infections.





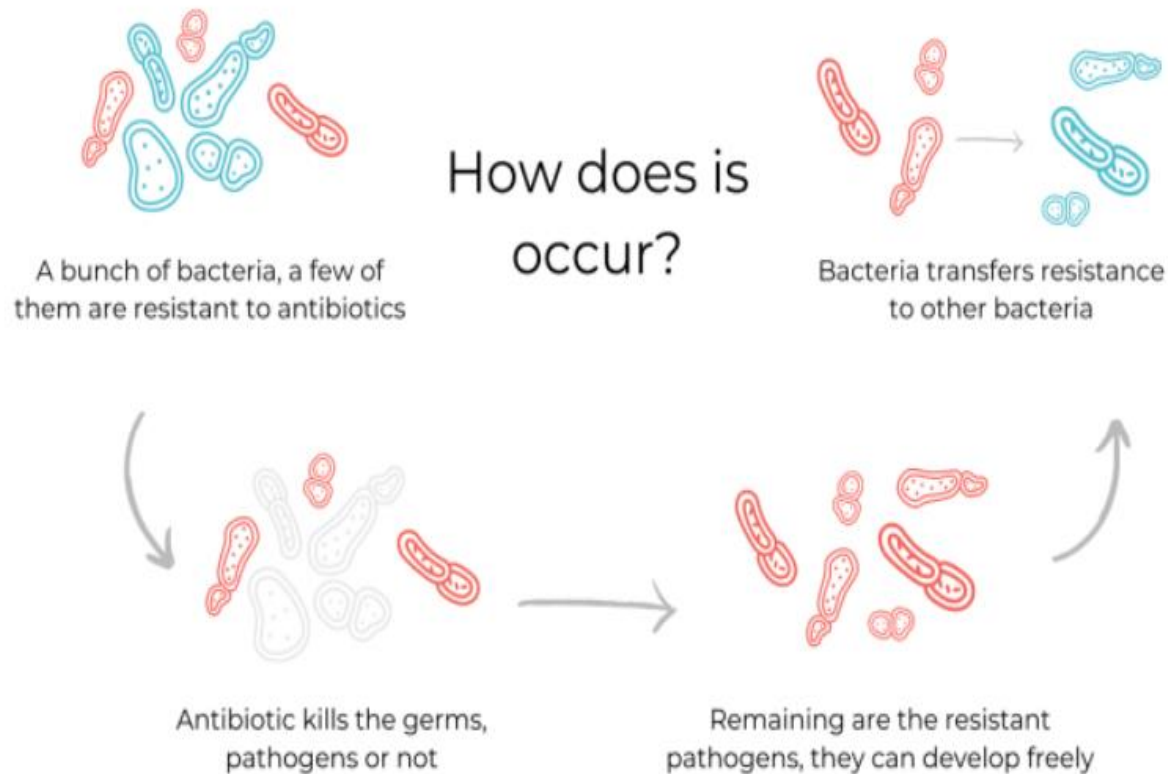
# Infection vs. Colonization

- Colonization:
  - Many individuals with CPE carry the bacteria in or on their bodies **without developing an infection**.
  - The presence and growth of CPE occur, but the resident remains **asymptomatic**.
  - Colonization is frequently observed in the urine and GI tract.
  - Colonized individuals **can still spread CPE to others**.
  - Colonizing CPE strains may progress to cause infections if they enter sterile body sites such as the bladder, lungs, or bloodstream.



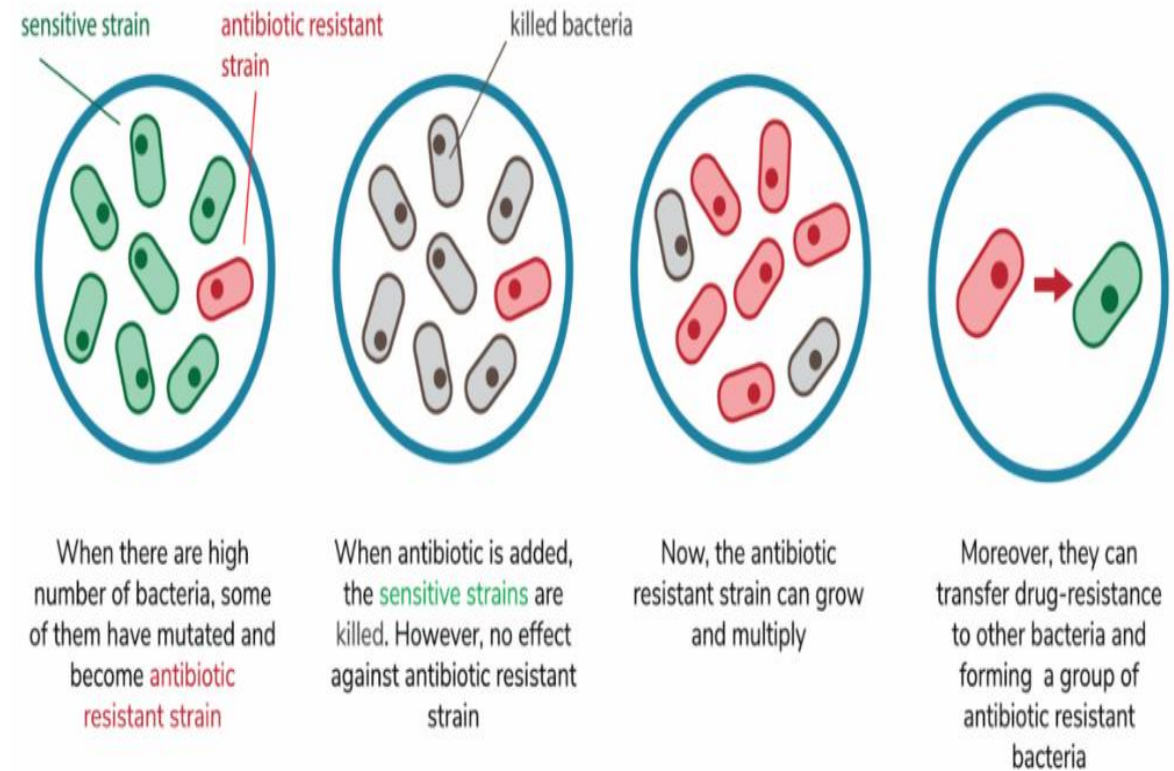
# Antibiotic Resistance

## Antibiotic Resistance



## Drug resistant bacteria

How does it happen?



# Why are we Concerned About CPE

1. CPE can transfer genes that confer antibiotic resistance to other bacteria, potentially leading to the spread of resistance among different bacterial strains (e.g., from E. coli to Klebsiella).
2. Residents can remain colonized with CPE for extended periods, sometimes **exceeding 18 months**.



# Why are we Concerned About CPE

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3. Approximately **16.5%** of colonized cases progress to infection, posing a significant risk to affected individuals.
4. CPE infections are challenging to treat due to **limited treatment options**. Carbapenem antibiotics, often considered as a **last resort for severe resistant infections**, may be ineffective against CPE strains.
5. Infections caused by CPE strains are associated with a **higher mortality rate**. Patients infected with CPE have an estimated **3x greater likelihood of death**.

# Risk Factors for CPE

## 1. Exposure within Healthcare Facilities:

- Exposure to CPE within healthcare settings is a significant risk factor for infection.
- Factors such as **prolonged length of stay and intensity of exposure**, such as sharing a room or frequent contact with infected individuals, increase the likelihood of acquisition.



# Risk Factors for CPE

## 2. Recent Travel and Hospitalization Abroad:

- **Travel and hospitalization abroad** are important risk factors for CPE acquisition.
- However, there is a growing number of cases that are likely acquired domestically, indicating the increasing prevalence of CPE within local healthcare facilities.



- It is essential to inquire about these risk factors upon admission of residents to healthcare facilities – known as **risk factor-based screening**.
- The goal is to promptly identify residents who are colonized or infected with antimicrobial-resistant organisms (AROs), including CPE, in order to implement appropriate IPAC measures to mitigate the risk of transmission.

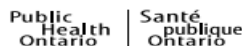
# High Risk Factors for CPE

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1. Receipt of care in a hospital in or **outside of Canada in the past 12 months.**
2. Who have **greater than 12 hours of continuous stay** in any hospital or health care institution within the last 12 months.
3. Receipt of care in any hospital that has reported transmission of CRE/CPE.
4. Contact or a known case of CRE/CPE.
5. Who have shared a room or bathroom with a patient found to be colonized or infected with CRE/CPE, where contact precautions have not been in use.
6. Who have recently been exposed to a unit/area of a health care facility with an CRE/CPE outbreak.

# PHO Checklist for CPE

## Resident Admission, Discharge, and Transfer Considerations for Carbapenemase-Producing *Enterobacteriaceae* (CPE)



Published: November 2023

### Background

There are many factors that long-term care homes (LTCHs) must consider when transferring, discharging and admitting a resident with a carbapenemase-producing *Enterobacteriaceae* (CPE).

Some of these factors are:

- communication between settings;
- education and training of staff, residents and visitors;

The following checklists have been developed as a guide for the safe admission, transfer, and discharge of residents who are colonized or infected with CPE.

### This checklist can be used:

In addition to a regularly reviewed and updated policy, to help organizations when they are planning for the safe admission, transfer, or discharge of residents who are colonized or infected with CPE.

While this checklist was developed for LTCHs, it may also be used in other types of health care settings. The following three sections provide important factors for health care settings to consider during the following situations:

- Preparing for and admitting a resident with CPE.
- Transferring a resident with CPE to another setting.
- Discharging a resident with CPE to their own home.

These checklists were informed by the documents listed under Sources.

### Contents

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3 - Considerations for Discharging a Resident with CPE Home or for a Leave of Absence .....	3
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Resident Admission, Discharge, and Transfer Considerations for Carbapenemase-Producing *Enterobacteriaceae* (CPE)

### Assessor Information

First name:  Last name:   
 Position:  Date (yyyy-mm-dd):

### Resident Information

First name:  Last name:   
 Date of birth (yyyy-mm-dd):

### 1 - Considerations to Prepare for Admitting a Resident with CPE

The following checklist may be completed by the receiving LTCH to make sure they are prepared for the admission of a resident with CPE. When preparing to admit a resident with CPE, it is important to ensure you already have in place, or are able to implement, practices that can reduce the risk of spreading CPE to other residents and staff. The below checklist can help you determine if you are ready to safely admit a resident with CPE, and identify areas where you can improve. The more of the below factors you have in place, or are able to implement, the lower the risk will be of spreading CPE at your LTCH.

Staff who interact with residents have received education and training in the management of CPE with respect to:<sup>5</sup>

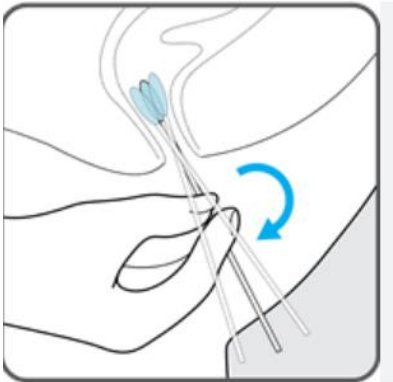
- Yes  No Personal protective equipment (PPE) requirements and how to put on and take off PPE.  
 Yes  No Routine Practices and Contact Precaution requirements including hand hygiene.  
 Yes  No Staff are comfortable putting on and taking off PPE.

- Yes  No Alcohol-based hand rub or hand hygiene sinks available in all areas where hand hygiene should take place (e.g., at the point of care).  
 Yes  No PPE is available (or can it be made available) where it is needed to care for the resident (i.e., at the point of care/entry to the resident's room).  
 Yes  No An IPAC risk assessment has been conducted to determine the risk of transmission of CPE, to assist with the resident care plan and placement decisions.<sup>4</sup>  
 Yes  No A resident care plan has been developed that will minimize the risk of CPE transmission, while still promoting a high quality of life for the resident.  
 Yes  No The resident and family is involved in the development of the plan of care.<sup>1</sup>  
 Yes  No A private room is available for the resident.  
 • Note: If not, a single roommate is preferred over multiple roommates. Roommates should be at low risk for getting CPE.<sup>4</sup>  
 Yes  No A washroom/commode can be dedicated to the resident with CPE.  
 Yes  No There is a process in place for regular cleaning and disinfection of shared showers and tubs.



# Testing for CPE

- If a resident answers "yes" to any of the risk factor questions or is unable to answer any screening questions, testing and preemptive implementation of control measures are necessary.
- Appropriate specimen collections include:
  - ✓ A **rectal swab**, making sure fecal material is visible on the swab
  - ✓ OR a **stool sample** (if a rectal swab is not feasible/acceptable)
  - ✓ AND a **wound swab** (if wound is present at time of admission)
  - ✓ **Urine sample** (if the patient is catheterized at time of admission)



# Rectal Swab

- A **rectal swab** is the preferred **sample type** for testing for CPE and should always be considered preferable to a stool sample.
- To collect a rectal swab, gently insert a swab inside the rectum to a depth of **3-4 centimeters**.
- It is important to ensure that the swab has visible fecal material on it to ensure an adequate sample.

## For rectal swab specimens



Partially open swab package and remove swab. Do not touch the soft tip or lay the swab down. If the soft tip is touched, laid down, or dropped, discard and get a new Aptima Multitest Swab Specimen Collection Kit. **Hold swab, placing thumb and forefinger in the middle of shaft covering black score line.** Do not hold shaft below score line.



Carefully insert swab into the rectum about 1-2 inches (3-5 cm) past the anal margin (the outside of the anus) and **gently rotate swab clockwise for 5-10 seconds**. Withdraw swab without touching skin.



**While holding swab in hand, unscrew tube cap.** Do not spill tube contents. If tube contents are spilled, discard and replace with a new Aptima Multitest Swab Specimen Collection Kit.



Immediately place swab into transport tube so black score line is at top of tube. **Align the score line with top edge of tube and carefully break shaft.** Discard top portion of shaft.



Tightly screw cap onto tube. When collecting multiple specimens from the same patient, the tube label provides a specimen source field for unique identification for specimen location.



Helenus provides this collection procedure guide as a general informational tool only. It is not an affirmative instruction or guarantee of performance. ©

# Transmission of CPE

- To acquire CPE, a person must be exposed to the bacteria.
- CPE is typically spread from person to person through **contact with infected or colonized individuals**, particularly through contact with wounds or stool.
- Transmission of CPE often occurs via the **hands of healthcare personnel** or through **contaminated medical equipment** such as intravenous catheters, urinary catheters, or wounds.



# Sinks, Showers and Drains

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CPE can be found in environmental reservoirs such as [sinks, shower and drains](#) and can result in CPE transmission.

- Handwashing sinks should only be used for their intended purpose.
  - They should not be used for other activities, such as disposing of body fluids or cleaning equipment.
- Facilities should consider implementing enhanced cleaning protocols for sinks and showers on a regular basis, preferably twice weekly.
  - Additionally, thorough cleaning should be conducted at the time of discharge or transfer for rooms occupied by patients or residents with CPE.
- If sinks remain colonized with CPE despite repeated cleaning efforts, consideration should be given to replacing the sinks and/or the related horizontal drainage system.

[PIDAC: Best Practices for Environmental Cleaning for Infection Prevention and Control](#) (page 150)

# Management of Suspected Case

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- If the screening sample tests **NEGATIVE**, the patient should continue on additional precautions until 2 consecutive follow-up samples also test negative.
- **Minimum 3 sets of specimens taken on different days with at least one taken 21 days after last exposure.**
- Once 3 consecutive negative results are obtained, the patient can be removed from additional precautions.
- However, if any subsequent samples test positive, the resident should be managed as a confirmed case and appropriate measures should be taken accordingly.

[Annex A: Screening, Testing and Surveillance for Antibiotic-Resistant Organisms \(AROs\)](#)

# Additional Precautions

1. Residents who are colonized or infected with CPE, as well as those with pending risk factors and testing results, should be placed under routine practices and **contact precautions**.
2. **Hand hygiene and point of care risk assessment** are essential practices.
  - Using gloves and gowns during direct care activities such as bathing residents, changing briefs, or wound dressing.
  - Changing gloves and performing hand hygiene between residents, disinfecting shared equipment between residents, are crucial measures to prevent transmission.



# Accommodations to Minimize the Risk of Transmission

Private Single Rooms

Priority for High-Risk Residents

Regular Cleaning & Disinfection

Dedicated Time Slots

Collaboration with EVS



# Accommodations to Minimize the Risk of Transmission

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## 1. Private Single Rooms

- Whenever possible, residents should be accommodated in **private single rooms**, as this is associated with the lowest risk of transmission within the facility.

## 2. Priority for High-Risk Residents

- If single rooms are limited, priority should be given to residents who are at **highest risk for transmission**, such as those with incontinence, medical devices, or wounds with uncontrolled drainage.

## 3. Regular Cleaning and Disinfection

- Facilities should have processes in place for **regular cleaning and disinfection** of shared showers and tubs to reduce the risk of transmission. This includes thorough cleaning after each use by a resident.



# Accommodations to Minimize the Risk of Transmission

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## 4. Dedicated Time Slots

- Scheduling **dedicated time slots for residents to use shared showers and tubs**. This helps to minimize crowding and allows for more effective cleaning and disinfection between uses.

## 5. Collaboration with Environmental Services

- Ensure that **showers and tubs are promptly cleaned and disinfected following resident's use**. This proactive approach helps to maintain a clean and safe environment for all residents.

# CPE Positive Residents When Outside of their Room

Participation in activities is crucial for the residents' quality of life and should be encouraged. However, it must be balanced with IPAC practices to minimize the risk of transmission to other residents and staff.

1. Encourage frequent **hand hygiene** among all residents, including those who are CPE-positive, to reduce the spread of infectious agents.
2. Promote activities that **do not involve direct contact or sharing** of items among residents. This reduces the risk of transmission between individuals.
3. Any shared items should be thoroughly cleaned and disinfected after each use to prevent the spread of infection.



# CPE Positive Residents When Outside of their Room

4. The **health and characteristics of other residents** who may be dining with or participating in activities directly with the CPE-positive resident. Extra precautions may be necessary depending on the vulnerability of other residents.



5. Utilize **large, open areas** that provide enough space to allow residents to maintain **physical distancing** and avoid direct contact during activities.



# TPH Reporting

- CPE is a Reportable Disease.
- Once colonized or infected with CPE, individuals may carry CPE indefinitely, therefore, **only the first positive isolate is reportable unless a different carbapenemase is identified.**
- All confirmed cases of CPE require **investigation to determine if nosocomial transmission** of CPE has occurred and to identify the source of transmission.

## REPORTABLE DISEASES OF PUBLIC HEALTH SIGNIFICANCE

### CONTACT INFORMATION:

#### Toronto Public Health - Communicable Disease Surveillance Unit

277 Victoria Street, 10th Floor, Toronto, ON M5B 1W2

Phone: 416-392-7411 -- Fax: 416-392-0047

After hours: 3-1-1 or 416-392-CITY (2489) for callers from outside of Toronto

### Timely reporting of communicable diseases is essential for their control.

If you suspect or have laboratory confirmation of any of the following specified diseases of public health significance or their etiologic agents (as per Ontario Reg. 135/18 and amendments under the Health Protection and Promotion Act), please report them to the local Medical Officer of Health.

Diseases marked \* should be reported immediately to the Medical Officer of Health by telephone (24 hours a day, 7 days a week) or fax (Mon-Fri, 8:30 am – 4:30 pm only). Other diseases can be reported the next working day by fax, phone, or mail.

Acquired Immunodeficiency Syndrome (AIDS)

Acute Flaccid Paralysis

Amebiasis

Anaplasmosis

\* Anthrax

Babesiosis

Blastomycosis

\* Botulism

\* Brucellosis

Campylobacter enteritis

Carbapenemase-producing Enterobacteriaceae (CPE) infection or colonization

Food poisoning, all causes

\* Gastroenteritis, Outbreaks in institutions and public hospitals

Giardiasis

Gonorrhoea

\* Group A Streptococcal disease, invasive (IGAS)

Group B Streptococcal disease, neonatal

\* Haemophilus influenzae disease, all types, invasive

\* Hantavirus pulmonary syndrome

\* Hemorrhagic fevers, including:

Paralytic Shellfish Poisoning

Paratyphoid Fever

Pertussis (Whooping Cough)

\* Plague

Pneumococcal disease, invasive

\* Poliomyelitis, acute

Powassan Virus

Psittacosis/Ornithosis

\* Q Fever

\* Rabies

\* Respiratory infection outbreaks in institutions and public hospitals

# Poll Question #1

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Question: How are Carbapenemase-producing Enterobacteriaceae (CPE) spread from one person to another?

- A. Through the air.
- B. Through respiratory droplets.
- C. Through contact transmission via hands or touching contaminated surfaces (e.g., table, door knob, light switches).
- D. Through food contamination.

# Poll Question #1

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Question: How are Carbapenemase-producing Enterobacteriaceae (CPE) spread from one person to another?

- A. Through the air.
- B. Through respiratory droplets.
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- D. Through food contamination.

# Poll Question #2

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Question: How is Carbapenemase-producing Enterobacteriaceae (CPE) treated?

- A. Antibiotics are given to both infected individuals and those colonized with CPE.
- B. Antibiotics are only given to infected individuals, not those colonized with CPE.
- C. Antibiotics are not used for either infected individuals or those colonized with CPE.
- D. Antibiotics are given to colonized individuals, but not to infected individuals.

# Poll Question #2

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Question: How is Carbapenemase-producing Enterobacteriaceae (CPE) treated?

- A. Antibiotics are given to both infected individuals and those colonized with CPE.
- B. Antibiotics are only given to infected individuals, not those colonized with CPE.
  - People who are colonized will not be given antibiotics because antibiotics treat infection, not colonization. Using antibiotics for colonization or any time when they are not needed can cause harm, such as bad side-effects, or more bacteria that are hard to treat.
- C. Antibiotics are not used for either infected individuals or those colonized with CPE.
- D. Antibiotics are given to colonized individuals, but not to infected individuals.



# Poll Question #3

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Question: Can a resident with Carbapenemase-producing Enterobacteriaceae (CPE) still participate in activities at the LTCH/RH?

- A. No, residents with CPE are not allowed to participate in any activities.
- B. Yes, residents with CPE can still participate in activities, but certain precautions must be taken.
- C. Only outdoor activities are permitted for residents with CPE.
- D. Activities are limited to individual sessions for residents with CPE.

# Poll Question #3

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Question: Can a resident with Carbapenemase-producing Enterobacteriaceae (CPE) still participate in activities at the long-term care home?

- A. No, residents with CPE are not allowed to participate in any activities.
- B. Yes, residents with CPE can still participate in activities, but certain precautions must be taken.**
- C. Only outdoor activities are permitted for residents with CPE.
- D. Activities are limited to individual sessions for residents with CPE.

# Resources to Review

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- [PHO: FREQUENTLY ASKED QUESTIONS Carbapenemase-Producing Enterobacteriaceae \(CPE\)](#)
- [PHO: CPE Transmission Risk Factors in Long-Term Care Homes](#)
- [PHO: FREQUENTLY ASKED QUESTIONS Information about CPE for Long-Term Care Homes Residents, Family and Visitors](#)

# Q&A

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