

Quick Guide



**Emergency**  
**Medical Services (EMS)**  
**Multidrug-resistant**  
**Organism (MDRO)**  
**Prevention**

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Information and Tools to Prevent  
Transmission and Enhance Communication



**pennsylvania**  
DEPARTMENT OF HEALTH

Division of Healthcare Associated Infection  
Prevention

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# Candida auris

## Background:

- A fungus that is often resistant to antifungal medications and is difficult to treat.
- Spreads easily among persons with underlying medical conditions.
- A person can be colonized or infected.
  - **Colonization** - on the skin or in other body sites. Doesn't cause illness.
  - **Infection** - causes a person to show symptoms.

## Transmission:

- Spreads by:



Person to Person



Hands of Healthcare Workers

- Contaminates:



Surfaces & Equipment

- Lives on surfaces for several weeks.
- [EPA-registered List P](#) environmental products should be used.



EPA List P

## Prevention:



Hand Hygiene



Gloves



Gown



Cleaning & Disinfection

# Carbapenem-resistant Enterobacterales (CRE)

## Background:

- Enterobacterales are a group of bacteria that includes *Escherichia coli* and *Klebsiella pneumoniae*.
- CRE are Enterobacterales that have resistance to carbapenems.
  - Carbapenems = a group of last-line antibiotics
- CRE may cause colonization or infection.
  - Infections can be found in sites such as wounds and gastrointestinal tract (stool).
  - Often in persons with frequent hospitalizations and those who live in long-term care facilities.

## Transmission:

- Spreads by:



Person to Person



Hands of Healthcare Workers

- Contaminates:



Surfaces & Equipment

## Prevention:



Hand Hygiene



Gloves



Gown



Cleaning & Disinfecting

# Carbapenem-resistant *Acinetobacter baumannii* (CRAB)

## Background:

- CRAB are *Acinetobacter baumannii* that are resistant to carbapenems.
- Bacteria naturally found in soil and water.
- CRAB can cause colonization or infection.
  - Infections can be found in the bloodstream, urinary tract, lungs, or wounds.
  - These often occur in persons with frequent hospitalizations and those with indwelling medical devices, wounds, or who are in intensive care units.

## Transmission:

- Spreads by:



Person to Person



Hands of Healthcare Workers

- Contaminates and lives for long periods of time on:



Surfaces & Equipment

## Prevention:



Hand Hygiene



Glove



Gown



Cleaning & Disinfecting

# Carbapenem-resistant *Pseudomonas aeruginosa* (CRPA)

## Background:

- CRPA are *Pseudomonas aeruginosa* that are resistant to carbapenems.
- Common cause of bacterial infections in healthcare settings and thrive in the presence of water.
- May cause colonization or infection.
  - Infections can include pneumonia, bloodstream infections, urinary tract infections, and surgical site infections.

## Transmission:

- Spreads by:

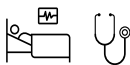


Person to Person



Hands of Healthcare Workers

- Contaminates:



Surfaces & Equipment

## Prevention:



Hand Hygiene



Glove



Gown



Cleaning & Disinfecting

# Carbapenemase-producing Organism (CPO)

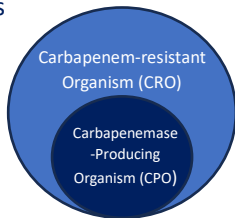
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## What are carbapenemases?

- Carbapenemases are enzymes that make carbapenem antibiotics ineffective.
- Bacteria can have a gene that produces a carbapenemase enzyme.
  - Examples of carbapenemase abbreviations: KPC, NDM, OXA-48, VIM and IMP.

## What are CPOs?

- Bacteria that produce a carbapenemase enzyme
- Carbapenem-resistant organisms can also have carbapenemase production.
  - Ex: CP-CRPA is a carbapenemase-producing, carbapenem-resistant *Pseudomonas aeruginosa*.



## Why are we concerned about CPOs?

- Bacteria can transfer their carbapenemase genes to other non-resistant bacteria.
  - Easily spreads resistance and could lead to outbreaks.
  - Infections are increasingly difficult to treat.

# Interfacility Communication

Communication is a crucial step to prevent transmission!



EMS providers play a key role in receiving health information and communicating it forward.

EMS providers need to be made aware of a patient's status to implement proper infection control practices.

## Communication Example One

**Hospital:** "I am calling to notify you of a transfer. This patient is leaving our hospital and being transferred back to their skilled nursing facility."

"Mr. Jones has stable vitals, has a tracheostomy, and is currently taking an antibiotic."

**EMS:** "Thank you for the report. Does this patient have any active infectious diseases? Does the patient have a history of a multi-drug resistant organism?"

"Mr. Jones is colonized with *Candida auris*, with a positive result from 2023.

"Is this patient currently on any transmission-based precautions?"



“Mr. Jones has contact precautions in place. The skilled nursing facility may place him on Enhanced Barrier Precautions.”

“Thanks. My partner and I will be sure to use gown and gloves when appropriate during transfer and care. We will also ensure the SNF is aware of his MDRO status and transmission-based precaution needs.”

## Communication Example Two

**EMS:** “Hello Ms. Smith, we are here with Mr. Jones. He is returning from his stay at the hospital.”

“His vital signs have been stable, and he is currently still on an antibiotic. I wanted to ensure you were aware of the patient’s MDRO status. He is colonized with *C. auris*.”

**Nursing Home:** “Thanks for the report. I am a new Director of Nursing here and I am not familiar with *C. auris*. Does it require anything special?”

“Mr. Jones is on contact precautions. The brightly colored form in the transfer papers is **the *C. auris* transfer letter**. There is more information there regarding infection prevention measures for *C. auris*. You can also call your local or state health department to get more information. The number is on the letter right here.”

“Thank you for the information. I will mark Mr. Jones’s chart and look over the letter to ensure we have everything in place right away.”

## Resources

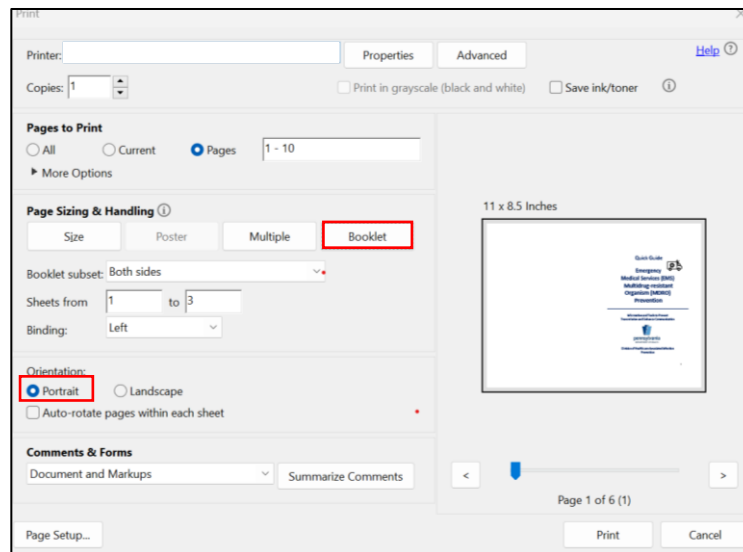
<b><i>C. auris</i></b>	<a href="#"><u>CDC Information on <i>Candida auris</i></u></a>	
<b>CRE</b>	<a href="#"><u>CDC Information on CRE</u></a>	
<b>CRAB</b>	<a href="#"><u>CDC Information on CRAB</u></a>	
<b>CRPA</b>	<a href="#"><u>CDC Information on CRPA</u></a>	

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# Instructions to Print

1. Select “File” in the upper left corner of the document -> “Print”.
2. Under the section “Pages to Print”, select the “Pages” and input 1-10.
3. Under the section “Page Sizing & Handling” ensure:
  - a. Select the booklet option.
  - b. Booklet subset option should be “Both sides”; Binding “Left”.
4. Select “Portrait” as the orientation.



5. Select “Print” to finish. Document will print double-sided\* with two slides per 8.5” x 11” page of paper.
  - a. You may need to manually reinsert the pages into single-sided printers to print double-sided;
  - b. To print single-sided, select “Multiple” in instead of “Booklet”. Select 2 pages per sheet. To assemble, cut each page down the middle to separate, arrange pages in sequential order, and collate in the upper left corner with a staple or ring.
6. Fold each page in half widthwise.
7. Arrange pages so the crease is on the left side and the page numbers are sequential.

8. Optional: Staple or clip pages together on the left side, at the crease.
9. Once complete, the printed version will read like a book and can be kept on-hand wherever the information may be needed (e.g. ambulance, training center, portable equipment bag).