Monitoring Transmission of Carbapenemase-Producing Organisms From Known Positive Cases in Acute Care: Assessment of Our Ring Screening Approach

Presented by: Katherine Yu RN BSN, Sidney Austin RN BSN
Authors: Sidney Austin, Aleksandra Gara, Mokka Lin, Katherine Yu

No Disclosures

Overview

- Background and Introduction to our Ring-Screen Surveillance Method
- Project: Assessment and Analysis
  - Case Reviews
- Lessons Learned
**Timeline**

CPO Surveillance in BC

- **2008**: 1st CPO in Canada
- **2010**: PHAC Carbapenem-resistant Gram-negative Bacilli Guidance
- **2014**: PICNet Tools for the Management of CPO
- **2016**: Mandatory surveillance program
- **2018**: PHO CPO made reportable, Community cases added in 2017
- **2019**: PICNet Updated CPO Toolkit

- VCH Ring Screening Implemented

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**VCHA Method of Ring Screening**

**Process:**
- ICP orders CPO screens for patients in adjacent rooms to known + isolated CPO cases

**Implementation:** Continues on the same designated day of the week (i.e., every Monday) until the known CPO patient is transferred or discharged from the unit, and for one week thereafter.

- Isolated case:
  - Known epidemiologically related patient (e.g., roommate) for CPO by collecting midstream urine samples and other clinical specimens (e.g., sputum, wound swab, etc.)
  - Assesses, if another patient shares the room, other adjacent rooms and the common access corridor
- If screening cultures or other clinical cultures identify additional CPO isolates or an enriched culture, an additional surveillance culture is obtained on a patient who recently had contact with the affected patient
- If any CPO case is identified, a recommendation for a round of screening is made
- Ring screening will continue on the same designated day of the week (i.e., every Monday) until the CPO patient is transferred or discharges, and for one week after that point, customer review determines most susceptible day of the week for specimen collection
- Emergency situations are communicated and immediate CPO patient transferred

**Ring Screen Example**

- A patient with known history of CPO (Klebsiella Pneumonia NDM 2018) is admitted to a medicine unit
- Patient is placed on contact precautions, admitted to a private room: 724
- ICP covering unit orders CPO screening swabs for the rooms adjacent (722 and 726) and the room across the hall (723)
- bedside nurse collects specimen; ICP reviews results when available
- Details are kept in Excel spreadsheet; a unique document is created for each CPO index ring screen
- Repeat weekly
Close Contact

PICNet Definitions

Anyone who had close contact with a known CPO patient within the past 12 months (Close contact is defined as: household member, roommate in hospital or shared nursing staff and physicians. In high-risk units, such as transplant units, ICU etc., close contact may constitute all patients on the entire unit.)

- [ ] Yes, please specify the nature of contact
  - [ ] Household, i.e., a family member with CPO
  - [ ] Resident of facility, i.e., shared the same care unit or long-term care facility with a patient infected with CPO
  - [ ] Other please specify ________________
  - [ ] No
  - [ ] Unknown

Project

Assessment and Analysis of Our Ring Screening Method

- We set out to assess the value of our ring screening protocol in regards to monitoring and understanding transmission of CPO due to the many contributing factors from potential lapses in IPAC practices.
- Recent records of the ring screens were retrieved, collated and summarized by our Epi team
- Whole genome sequencing has also been requested through collaboration with BCCDC to further investigate our findings
Ring Screening Data Summary
From January 1 2021 to October 31 2022

- Total Number of CPO Screens Collected (All participating VCH sites):
  - 1485

- Number of Index Patients Known CPO+:
  - 85

- Number of Unique Ring Screens:
  - 122

- New CPO+ Cases Identified:
  - 13*

Case Reviews
13 new CPO cases were identified from the ring screens that were not previously known

- True Cases:
  - 6

- Incidentals:
  - 3

- Errors/Other:
  - 4

CPO Risk Factors
Commonalities within the new cases

<table>
<thead>
<tr>
<th>Case</th>
<th>Length of Stay to CPO+</th>
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<tbody>
<tr>
<td>Case 1</td>
<td>25</td>
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<tr>
<td>Case 2</td>
<td>12</td>
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<tr>
<td>Case 3</td>
<td>63</td>
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<td>Case 4</td>
<td>30</td>
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<tr>
<td>Case 5</td>
<td>37</td>
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<td>Case 6</td>
<td>7</td>
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Proximity to Index
Geographical Location in relation to CPO Index Case

Adjacent Room
01
Adjacent Room
02
Same Room

06
Room Across
03
Adjacent Room
05
Adjacent Room
04

Adjacent Room

Same Room

06

Placed in room after index case discharged

Case 1 Review

- Case 1 was newly found to have Citrobacter freundii KPC+ from ring screen
- Admitted Jun 6-Aug 30, 2022 (between ICU, BTHA and BMT)
- BMT pt with lots of complications
- Adjacent room to index case starting in July 24
  1st screen negative July 25, 2nd screen positive August 8, 2022
- Index case has Phytobacter sp. KPC+

Case 6 Review

- Case 6 was newly found to have Citrobacter freundii KPC & NDM from ring screen
- Admitted Sept 8-Oct 1, 2021, then Oct 17 to 27, 2021, then Nov 28-Dec 3, 2021
- Recent liver transplant pt
- Pt was admitted into T4D 650-1 from Sept 22-October 1, 2021
  1st screen October 18 neg, 2nd screen Nov 30 positive
- Admitted into index case room after index discharged
- Index case had Ecoli NDM
  Admitted Sept 12-22, 2021 to T4D 650-1

Same room as index and newly found CPO case
Value of CPO Ring Screens

**Pros:**
- Discovered new cases
- Earlier recognition & IPAC actions initiated
- Prevent potential further transmissions

**Cons:**
- Labor intensive (bedside nurses, ICP, lab technician)
- Amount of swabs sent, $
- Not pleasant for patients

Lessons Learned & Next Steps

- VCHA will maintain the practice of ring screening given there were new cases found
- Early recognition of colonization allowed earlier introduction of IPC measures
- Need for standardized tracking tool for ring screens
- WGS will provide further insight

Thank you

Questions?
Acknowledgements

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For More Information About This Presentation, Contact: Sidney.Austin@vch.ca

References