

Florida Department of Health Response to a Novel Organism



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Health Care-Associated Infection Prevention Program
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Objectives

- Introduce multidrug-resistant organisms (MDRO), specifically those with novel resistance patterns that have been investigated in Florida
- Discuss strategies used to contain novel or targeted MDROs and how the outbreak investigation occurred in the state

Background

- Multidrug-resistant strains of *Pseudomonas aeruginosa* (MDRPA) is a global concern¹
 - Increased morbidity and mortality¹
 - Outbreaks of MDRPA are mostly caused by MDRPA that produce carbapenemases¹
- VIM-producing *Pseudomonas aeruginosa* had not previously been identified in Florida

Notable MDRO Case

- Verona Integron-Encoded Metallo-Beta-Lactamase (VIM)-producing *Pseudomonas aeruginosa*
- Discovered through enhanced surveillance between DOH and an acute care hospital
- Patient in a long-term acute care facility
- Novel mechanism of resistance in the state (and the U.S.)
- 14 cases identified during the outbreak
 - Led to the identification of a concurrent KPC outbreak within the same facility
- Implemented containment strategies to reduce and prevent ongoing transmission

Containment Strategies: Identify the Organism

Tier 1

Organisms with resistance mechanisms novel to the U.S. or organisms with no current treatment options having the potential to spread more widely within a region (e.g. vancomycin-resistant *Staphylococcus aureus*)

Tier 2

Organisms primarily found in health care settings, but not regularly in the region (e.g. Verona Integron-Encoded Metallo-Beta-Lactamase (VIM)-producing CRE, New Delhi Metallo- β -lactamase-producing CRE)

Tier 3

Organisms targeted by the facility that are established in the U.S. and identified in the region but not endemic (e.g. CRE-producing *Klebsiella pneumoniae* carbapenemase)

Tier 2

Implemented Containment Strategy:

- Ensure notification to primary caregiver, patient-care personnel, health care staff.
- Ensure implementation of infection control measures.
- Inform patient and family.
- Conduct a health care investigation.
- Conduct a contact investigation.
- Implement a process to ensure adherence to infection control measures.

Goals of Response

- Identify if transmission has occurred and is continuing to occur
- Guide containment and prevention measures

Continued Containment Strategies

- Continuation or adjustment of transmission-based precautions
- Maintained database of patients and contacts
- Guided and assisted with multiple Infection Control Assessment and Response (ICAR) site visit with the HAI Program
- Decide on the need for active laboratory surveillance
 - Identifies patients colonized with a particular organism who are not showing symptoms
 - Point-prevalence studies (PPS)
 - Admission and discharge screening
- Continued collaboration between the HAI Program, CHD, BPHL, and the facility
- Attended conference call(s) with DOH, CDC, and BPHL (as needed)

Contact Investigation

- HAI Program provided guidance in conjunction with CDC
- Indication for point-prevalence survey
 - Rapidly evaluate prevalence of CRE in facility
 - Typically screen all patients present on unit
 - Useful when previously unrecognized CRE patients have been housed on certain wards/units
 - Evaluated for additional transmission during outbreak

Contact Investigation, continued

Active laboratory surveillance

- Screening of patients who might not be epidemiologically linked to known CRE patient but met pre-specified criteria
 - All admissions
 - High-risk patients (e.g., those admitted from long-term acute care facilities, patients who received medical care in endemic regions)
 - High-risk settings (e.g., intensive care units)
 - Discharge screens
- More useful in areas with higher CP-CRE prevalence and during CRE outbreaks

Broader Screening

- Prospective surveillance of laboratory cultures.
- Environmental cultures generally not recommended unless transmission identified or suspected.
 - Coordinated through CDC
 - Onsite technical assistance provided

Role of BPHL

- Isolate testing
- Serve as subject matter experts (SME)
- Forward isolates to CDC or the Antibiotic Resistance Laboratory Network (ARLN) regional lab

Role of the HAI Program

- SMEs
- Guidance and reference to appropriate guidance documents
- Provide notification to the CHDs
- CDC contacts, especially for organisms of interests
- Educational and webinar material
- Staff to conduct ICARs and onsite technical assistance

Lessons Learned

- Collaboration with facility leadership is instrumental for success of outbreak response and prevention.
- Need for patient education resources to inform on role of PPS for continuity of the investigation.
- Communication with all stakeholders is essential.
- When preparing for PPS it is important to establish capacity, resources, man-power required, and proper collection and shipping methods.
- Need for continual assessment and gap mitigation.

Resources

- Interim Guidance for a Health Response to Contain Novel or Targeted Multidrug-resistant Organisms (MDROs)
 - www.cdc.gov/hai/containment/guidelines.html
- Facility Guidance for Control of Carbapenem-Resistant Enterobacteriaceae (CRE) – November 2015 Update CRE Toolkit
 - www.cdc.gov/hai/organisms/cre/cre-toolkit/index.html
- Infection Control Assessment Tools
 - www.cdc.gov/hai/prevent/infection-control-assessment-tools.html

References

1. Voor, A. F., Severin, J. A., Hagenars, M. B., de Goeij, I., Gommers, D., & Vos, M. C. (2018). VIM-positive *Pseudomonas aeruginosa* in a large tertiary care hospital: matched case-control studies and a network analysis. *Antimicrobial Resistance & Infection Control*, 7(1), 32.

Thank you!

Questions?

Thank you!

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