Candida auris Containment –
Join the Effort Before It’s Too Late

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APIC Consulting Services, Inc.

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Objectives

• Recognize the importance of a coordinated approach to controlling *Candida auris* and other multi-drug resistant organisms

• Describe how the national containment efforts to prevent spread of *Candida auris* in healthcare settings have been applied in the metropolitan Chicago area

• List the unique challenges with implementing activities to reduce *Candida auris* transmission in long term care facilities

• Identify one thing you can do to contribute to containment efforts
Emergence and Rapid Regional Spread of KPC, Chicago Area, 2008

Won SY et al. CID 2011: 53:532
Original Investigation

New Delhi Metallo-β-Lactamase-Producing Carbapenem-Resistant *Escherichia coli* Associated With Exposure to Duodenoscopes

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**IMPORTANCE** Carbapenem-resistant Enterobacteriaceae (CRE) producing the New Delhi metallo-β-lactamase (NDM) are rare in the United States, but have the potential to add to the increasing CRE burden. Previous NDM-producing CRE clusters have been attributed to person-to-person transmission in health care facilities.

**OBJECTIVE** To identify a source for, and interrupt transmission of, NDM-producing CRE in a northeastern Illinois hospital.

**DESIGN, SETTING, AND PARTICIPANTS** Outbreak investigation among 39 case patients at a tertiary care hospital in northeastern Illinois, including a case-control study, infection control assessment, and collection of environmental and device cultures; patient and environmental isolate relatedness was evaluated with pulsed-field gel electrophoresis (PFGE). Following identification of a likely source, targeted patient notification and CRE screening cultures were performed.

**MAIN OUTCOMES AND MEASURES** Association between exposure and acquisition of NDM-producing CRE; results of environmental cultures and organism typing.
Unique CRE cases reported to XDRO registry by month of first clinical culture, 11/1/13 - 12/31/17 (N=3740)

Slide courtesy of Angela Tang.
Candida auris

• First identified in 2009

• Fungal organism that causes serious illness
  – Fungemia in most susceptible patients
  – Can be resistant to all three anti-fungal classes
  – One in three patients with invasive disease die

• Difficult to identify

• Persistent in the environment

Cases are categorized by the state where the specimen was collected. Most probable cases were identified when laboratories with current cases of *C. auris* reviewed past microbiology records for *C. auris*. Isolates were not available for confirmation. Early detection of *C. auris* is essential for containing its spread in healthcare facilities.

Countries from which *Candida auris* cases have been reported, as of August 31, 2018

- Single cases of *C. auris* have been reported from Austria, Belgium, Malaysia, the Netherlands, Norway, Russia, Switzerland, and the United Arab Emirates.
- Multiple cases of *C. auris* have been reported from Australia, Canada, China, Colombia, France, Germany, India, Israel, Japan, Kenya, Kuwait, Oman, Pakistan, Panama, Saudi Arabia, Singapore, South Africa, South Korea, Spain, the United Kingdom, the United States (primarily from the New York City area, New Jersey, and the Chicago area) and Venezuela; in some of these countries, extensive transmission of *C. auris* has been documented in more than one hospital.
- U.S. cases of *C. auris* have been found in patients who had recent stays in healthcare facilities in India, Kuwait, Pakistan, South Africa, the United Arab Emirates, and Venezuela, which also have documented transmission.
- Other countries not highlighted on this map may also have undetected or unreported *C. auris* cases.

**Illinois C. auris cases (n=368) by culture date, as of 09/26/18**

Clinical: Laboratory evidence of *C. auris* from clinical culture.
Probable: Laboratory evidence of *C. haemulonii* from clinical culture and epidemiologic linkage to confirmed case.
Suspect: Laboratory evidence of *C. haemulonii* from clinical culture and no epidemiologic link.
Screening: Laboratory evidence of *C. auris* from screening or surveillance culture.

*Includes 14 colonized to clinical cases*
Illinois *C. auris* clinical cases (N=78) by specimen type and case status, as of 09/26/18

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Confirmed, N=72 n/N (%)</th>
<th>Probable, N=4 n/N (%)</th>
<th>Suspect, N=2 n/N (%)</th>
<th>TOTAL, N=78 n/N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood</td>
<td>30/72 (42%)</td>
<td>2/4 (50%)</td>
<td>1/2 (50%)</td>
<td>33/78 (42%)</td>
</tr>
<tr>
<td>Urine</td>
<td>24/72 (33%)</td>
<td>--</td>
<td>1/2 (50%)</td>
<td>25/78 (32%)</td>
</tr>
<tr>
<td>Wound</td>
<td>4/72 (6%)</td>
<td>1/4 (25%)</td>
<td>--</td>
<td>5/78 (6%)</td>
</tr>
<tr>
<td>Sputum</td>
<td>3/72 (4%)</td>
<td>--</td>
<td>--</td>
<td>3/78 (4%)</td>
</tr>
<tr>
<td>Bronchial Wash</td>
<td>2/72 (3%)</td>
<td>--</td>
<td>--</td>
<td>2/78 (3%)</td>
</tr>
<tr>
<td>Other</td>
<td>9/72 (13%)</td>
<td>1/4 (25%)</td>
<td>--</td>
<td>10/78 (13%)</td>
</tr>
</tbody>
</table>

Confirmed: Laboratory evidence of *C. auris* from clinical culture.
Probable: Laboratory evidence of *C. haemulonii* from clinical culture and epidemiologic linkage to confirmed case.
Suspect: Laboratory evidence of *C. haemulonii* from clinical culture and no epidemiologic link.
# C. auris Environmental Sampling Results - 2018

<table>
<thead>
<tr>
<th>Facility</th>
<th>Number of Positives</th>
<th>Number of Specimens</th>
<th>Percent Positive Sites</th>
<th>Description of Positive Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>vSNF-8</td>
<td>5</td>
<td>30</td>
<td>17%</td>
<td>• Resident room: Over the bed table; Bedrail/bed controls (Bed 1); Bedrail/bed controls (Bed 2); • Hallway nursing cart items: Glucometer; Temperature meter/probe</td>
</tr>
<tr>
<td>vSNF-29</td>
<td>0</td>
<td>20</td>
<td>0%</td>
<td>--</td>
</tr>
<tr>
<td>vSNF-10</td>
<td>5*</td>
<td>20</td>
<td>25%*</td>
<td>• Room 1: Bedrails/bed controls; Ventilator controls, window ledge, radiator • Room 2: Bedrails; overbed table &amp; vent controls; TV and bedside tables, window ledge</td>
</tr>
<tr>
<td>LTACH-4</td>
<td>1*</td>
<td>20</td>
<td>5%*</td>
<td>• Hallway items: Pulse-ox and crash cart</td>
</tr>
<tr>
<td>LTACH-2</td>
<td>3*</td>
<td>20</td>
<td>15%*</td>
<td>• Room: BP, temp probe, IV/TPN controls • Hallway items: Glucometer; crash cart</td>
</tr>
<tr>
<td>Total</td>
<td>14*</td>
<td>110</td>
<td>13%*</td>
<td></td>
</tr>
</tbody>
</table>

*Final results pending

Slide courtesy of Angela Tang
Public health teams nationwide can launch early, aggressive responses to contain spread and protect people—at the first sign of antibiotic resistance, every time.

Find guidance, lab protocols, and more resources: www.cdc.gov/HAI/Outbreaks/MDRO

SOURCE: AR Investment Map: www.cdc.gov/ARinvestments
CDC Containment Strategy

Core Elements

- Rapid detection in health care facilities.
- Infection control assessments led by the health department.
- Colonization screenings, when needed, to make sure that unrecognized spread has not already occurred.
- Coordination/communication between healthcare facilities in an area.
- Continued infection control assessments and colonization screenings until spread is controlled.
CRE Containment Strategy

• Identifying if transmission/dissemination is occurring.
• Identifying affected patients.
• Ensuring appropriate control measures are promptly initiated/implemented to contain potential spread.
• Characterizing the organism or mechanism in order to guide further response actions, patient management, and future responses.
Candida auris Containment Strategy

- Standard and Contact Precautions in a private room when possible
- Hand hygiene
- Environmental cleaning and disinfection with an EPA List K agent
- Screening contacts of cases
  - Current roommates
  - Roommates within the last month
Candida auris Containment Strategy

Nursing Home Considerations

• Functional residents without wounds or indwelling devices who perform hand hygiene may present a lower risk for transmission and may not need Contact Precautions.

• Healthcare providers should still wear a gown and gloves for changing wound dressings, assisting with activities of daily living, and when performing tasks that put them at risk.
Candida auris Containment Strategy

Nursing Home Considerations

• Residents can leave their rooms if they have clean hands and secretions/drainage is contained
• Attention to shared equipment and scheduled last of the day for therapy if possible
• Continue precautions until no longer colonized.
Management of CRE in Long Term Care Facilities

• CRE background information
• Surveillance
• Hand hygiene
• Standard, Enhanced Standard and Transmission-Based Precautions
• Internal and external communication
• Antibiotic stewardship
• Resident skin cleansing
• Environmental Cleaning and Disinfection

Management of CRE in Long Term Care Facilities

• Considers risk factors for transmission of CRE.
• Contact Precautions for residents dependent on care providers due to functional and clinical status.
• Enhanced Standard Precautions for residents who are independent, can reliably perform hand hygiene, in control of bowel/bladder, and contained wounds.
Local Containment Strategy

Chicago Prevention and Intervention Epicenters

REALM

IDPH

DUPAGE COUNTY HEALTH DEPARTMENT

APIC CONSULTING SERVICES, INC.

RUSH UNIVERSITY MEDICAL CENTER

CCHS

XDRO registry

CDC

HEALTHY CHICAGO

CHICAGO DEPARTMENT OF PUBLIC HEALTH

Cook County DEPT of Public Health

Chicago PROTECT
(Providing Regional Organizations with TEchniques to ConTrol MDROs)

• An Intervention Bundle
  ▪ Uses data to predict high risk facilities
  ▪ Alerting system
  ▪ Targeted interventions
    o Point prevalence screening
    o Contact Precautions and cohorting
    o Chlorhexidine bathing
    o Healthcare worker education

• Measure control efforts over time
State Health Department Response

• Weekly State of the State calls
  ▪ Participation from involved jurisdictions
  ▪ Case count update
  ▪ Point prevalence survey results
  ▪ APIC Consulting update
    o Facility engagement/interaction
    o Infection Control Assessment and Response Status
  ▪ Lab capacity and inventory update
    o Point prevalence surveys
    o Environmental cultures
  ▪ Action items for the week
Local Health Department Response

• Onsite consultation
  ▪ Review of point prevalence screening data
  ▪ Cohorting assistance
  ▪ Establish facility expectations
  ▪ Discussion of Infection Control Assessment and Response (ICAR) findings and changes made
  ▪ Reinforcement of PROTECT elements
  ▪ Describe the support APIC Consulting can provide
  ▪ Set a date for an APIC Consulting follow up visit

• Biweekly follow up check in calls
Local Health Department Response

[FACILITY NAME] Review
[DATE]

1. Carbapenem-resistant Enterobacteriaceae and Pseudomonas aeruginosa (CRE and CRPA) are urgent public health threats because:
   - Infections are associated with high morbidity and mortality (up to 40 to 50% mortality among patients with invasive CRE)
   - Limited treatment options
   - Potential for rapid spread in healthcare facilities.

Residents in high-acuity long term care facilities are particularly vulnerable to CRE and CRPA infection due to medical complexity and antibiotic exposure.

Additionally, Candida auris is a public health concern due to:
   - Resistance of some C. auris infections to all three types of antifungal medicines,
   - Difficulty in laboratory identification
   - The occurrence of outbreaks in high-acuity long term care facilities.

2. Knowing which residents have multi-drug resistant organisms (MDROs), such as CRE, CRPA, and C. auris, is fundamental for prompt initiation of appropriate infection control practices and prevention of transmission in your facility. Awareness of these MDROs can be accomplished by the following:
   - Check the XDRO Registry for every admission to identify residents with previously known MDROs
   - Conduct periodic point prevalence surveys
vSNF A Ventilator/Trach Floor
March 2017 C. auris PPS Results

C. auris colonization prevalence=1.5% (1/69)

- C. auris positive
- Screened negative for C. auris
- Not tested for C. auris (refused or not in room)

Slide courtesy of Chicago Department of Public Health.
vSNF A Ventilator/Trach Floor
January 2018 C. *auris* PPS Results

*C. auris* colonization prevalence = 43% (29/67)

- C. *auris* positive
- Screened negative for C. *auris*
- Not tested for C. *auris* (refused or not in room)

Slide courtesy of Chicago Department of Public Health.
vSNF A Ventilator/Trach Floor
January 2018 CPO and *C. auris* PPS Results

*C. auris* and CPO colonization

- **C. auris**
- **C. auris** and KPC
- KPC or CRE with unknown mechanism of resistance
- **C. auris**, KPC, and NDM
- **C. auris**, VIM-CRPA, and KPC
- **C. auris** and KPC-CRPA

- Screened negative for *C. auris*, but not tested for CRE
- Screened negative for CRE and *C. auris*

Slide courtesy of Chicago Department of Public Health.
vSNF A Ventilator/Trach Floor
March 2018 CPO and *C. auris* PPS Results

Slide courtesy of Chicago Department of Public Health.
Communication to Facilities

• State of Illinois Rapid Electronic Notification System (SIREN) and Chicago Health Alert Network (HAN) Alerts

• Targeted scripted messages to patient sharing network facilities

• Extensively Drug Resistant Organism (XDRO) Registry
  ▪ Interfacility communication
  ▪ Manual query function
  ▪ Auto alerts

• Interfacility transfer information
APIC Consulting Assistance

• Hand Hygiene
  – Policy review
  – Assessment of alcohol based hand rub availability

• Environmental Cleaning and Disinfection
  – Policy review
  – Roles and responsibilities
  – Review of available chemistries and proper use
APIC Consulting Assistance

Focused Educational Assistance

• Hand hygiene
  – Basic hand hygiene elements for all staff
  – Train hand hygiene observers
  – Interrupted Observations

• Environmental cleaning and disinfection
  – Proper use of chemicals
  – Monitoring for adequacy of cleaning
Interrupted Observations

**Reminder**
Hands are the number one way germs are transmitted.

Clean your hands:
- Upon entering each room
- Upon exiting each room
- Between each resident
- Before and after the use of gloves

Thank you for cleaning your hands.

By cleaning **In**, cleaning **Out**, and cleaning **Between** residents you contribute to resident safety.
Each room marked using separate plastic bag with individual applicators saturated with Tide Free and Gentle®

Environmental Marking

Slide courtesy of Deb Burdsall
Environmental Marking

Example: Wiped and Missed

Slide courtesy of Deb Burdsall
40% of Surfaces Wiped

- Total Marked: 502
- Missed: 300
- Wiped: 202

Slide courtesy of Deb Burdsall
Example Room A

Missed: 11
Wiped: 45

Missed: 24%
Wiped: 76%

Slide courtesy of Deb Burdsall
Environmentaial Marking

Tympanic Thermometer

Checked 24 hours after marking.

Slide courtesy of Deb Burdsall
Environmental Marking

Thermometers and cases marked and checked 24 hours after marking.

Slide courtesy of Deb Burdsall
Environmental Marking

Feeding pump, internal control panel on foot of bed, and ventilator panel all marked and checked 24 hours after marking

Slide courtesy of Deb Burdsall
How to Clean a Quad Room

Slide courtesy of Deb Burdsall
Best Practices and Opportunities for Improvement

Facility provided permission to use photo.

Photos: © 2017 Mommarazzi Images

Photo: © 2017 Mommarazzi Images
Conclusions

• Continued regional collaboration will be important to contain *Candida auris*

• There is a high colonization burden of *Candida auris* in metropolitan Chicago

• Intensive bi-weekly check-ins with impacted facilities helps to keep them on task

• Sustained onsite facility support must emphasize the importance of hand hygiene compliance and environmental cleaning
Conclusions

• Creative solutions are needed to address the challenges of multi-occupancy rooms

• While the CMS Reform of Requirements for Long-Term Care Facilities have advanced infection prevention and control, additional focus must be placed on facilities caring for higher acuity residents such as those requiring ventilator support

• Further regulation may be necessary to ensure safe care

• There is an ongoing need for a better epidemiological understanding of *Candida auris*
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Candida auris:
Learn how you can stop it from spreading.

This drug-resistant fungus causes serious infections and spreads in healthcare facilities.

www.cdc.gov/fungal
Questions/Discussion

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