Containment of *Candida auris*

Tabletop Exercise
Candida auris

Background and Regional Epi
Fire Destroyed 10 Lives, but Not the Illusion

By TARIQ PANJA and MANUELA ANDREONI

RIO DE JANEIRO — Even in death the haggling went on. Christian Esmerio was going to be the one his family had been sure of it.

Dreams of Soccer Riches Survive Brazil Disaster

By MATT RICHTEL and ANDREW JACOBS

Last May, an elderly man was admitted to the Brooklyn branch of Mount Sinai Hospital for abdominal surgery. A blood test revealed that he was infected with a newly discovered germ as deadly as it was mysterious. Doctors swiftly isolated him in the intensive care unit.

The germ, a fungus called Candida auris, preys on people with weakened immune systems, and it is quietly spreading across the globe. Over the last five years, it has hit a neonatal unit in Venezuela, swept through a hospital in Spain, forced a prestigious British medical center to shut down its intensive care unit, and taken root in India, Pakistan and South Africa. Recently C. auris reached New York, New Jersey and Illinois, leading the federal Centers for Disease Control and Prevention to add it to a list of germs deemed "urgent threats."

The man at Mount Sinai died after 40 days in the hospital, but C. auris did not. Tests showed it was everywhere in his room, so invasive that the hospital needed spe-
DEADLY GERMS, LOST CURES

How a Chicago Woman Fell Victim to Candida Auris, a Drug-Resistant Fungus

The mysterious infection has appeared at hospitals around the world, but few institutions or families have discussed their experience.

Stephanie Spoor, center, with her husband, Gregory, left, during a bedside wedding ceremony of her son, Zack, to his new wife, Carley (right), at Northwestern Memorial Hospital in Chicago. Ms. Spoor died just a few days later. Spoor family photo

Stephanie Spoor lived with lupus for three decades. But after suffering heart failure and becoming infected with a recent outbreak of a deadly fungus, she survived less than two months.
Why are we concerned about *Candida auris*?

- Highly drug-resistant
- Patients can become colonized and develop invasive infections
- Spreads in healthcare settings

Modified Slide courtesy of Katie Forsberg, MPH
C. auris clinical cases, June 2016
C. auris clinical cases 2013–June 2019

~750 clinical cases
~2230 clinical + screening cases

CDC’s clinical alert

Slides courtesy of Katie Forsberg, MPH
C. auris clinical cases — United States, 2013–June 2019

Number of C. auris clinical cases

- 0
- 1
- 2-10
- 11-50
- 51-100
- 101 or more

Slides courtesy of Katie Forsberg, MPH
Spreads after introductions from abroad

- Cases are a result of introductions from abroad followed by local transmission
- Majority of cases don’t have direct links to healthcare abroad
C. auris cases reported in >35 countries

Slides courtesy of Katie Forsberg, MPH
Multiple Lineages

First Two Cases of *C. auris* in Chicago

Investigation of the First Seven Reported Cases of *Candida auris*, a Globally Emerging Invasive, Multidrug-Resistant Fungus – United States, May 2013 – August 2016

Snigdha Vallabhpaneni, MD1, Alex Kallen, MD2, Sharon Tsay, MD1,2; Nancy Chow, PhD1,2; Rory Welsh, PhD1; Jenna Kerins, VMD1,2; Sarah K. Kemble, MD4; Massimo Pacilli, MS4; Stephanie R. Black, MD4; Emily Landon, MD4; Jessica Ridgway, MD4; Tara N. Palmore, MD4; Adrian Zelzany, PhD4; Eleanor H. Adams, MD4; Monica Quinn, MS4; Sudha Chaturvedi, PhD4; Jane Greenko, MPH1,2; Rafael Fernandez, MPH1,2; Karen Southwick, MD1,2, E. Yoko Furuya, MD1,2, David P. Calfee, MD4, Camille Hamula, PhD1,2, Gopi Patel, MD1,2, Patricia Barrett, MSD1,2, Patricia Lefaro1,2, Elizabeth L. Berkow, PhD1,2, Heather Moulton-Meissner, PhD4, Judith Noble-Wang, PhD4, Ryan P. Fagan, MD4, Brendan R. Jackson, MD1, Shawn R. Lockhart, PhD4, Anastasia P. Litvinova, PhD4, Tom M. Chiller, MD1,2

![Diagram showing the timeline and cases of *C. auris* infections in Chicago.](diagram_url)
### C. auris Isolates, IL Patients 1 & 2

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC (µg/mL)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anidulafungin</td>
<td>0.12</td>
<td>S</td>
</tr>
<tr>
<td>Micafungin</td>
<td>0.06</td>
<td>S</td>
</tr>
<tr>
<td>Caspofungin</td>
<td>0.03</td>
<td>S</td>
</tr>
<tr>
<td>5-flucytosine</td>
<td>0.12</td>
<td>S</td>
</tr>
<tr>
<td>Posaconazole</td>
<td>0.03</td>
<td>S</td>
</tr>
<tr>
<td>Voriconazole</td>
<td>0.015</td>
<td>S</td>
</tr>
<tr>
<td>Itraconazole</td>
<td>0.06</td>
<td>S</td>
</tr>
<tr>
<td>Fluconazole</td>
<td>2.0</td>
<td>S</td>
</tr>
<tr>
<td>Amphotericin</td>
<td>1.0</td>
<td>S</td>
</tr>
</tbody>
</table>

[Genetic tree diagram showing genetic relationships among isolates from different countries.]

*Colored circles represent isolates from Colombia, Venezuela, and USA.*
Epidemiologic Investigation of *C. auris* IL1 & IL2

- Point prevalence survey at Hospital A: No new *C. auris* cases
- Point prevalence survey LTACH A: 4 new cases
- Environmental contamination identified on window ledge, mattress
- Contact isolation, list K disinfecting agents, hand hygiene and general infection prevention education
Epidemiologic Investigation of *C. auris* IL1 & IL2

- **Point prevalence survey at Hospital A:** No new *C. auris* cases
- **Point prevalence survey LTACH A:** 1 new case
- Environmental contamination identified on window ledge, mattress
- Contact isolation, list K disinfecting agents, hand hygiene and general infection prevention education
- **Two negative point prevalence surveys (April, July 2017)** at LTACH A
Illinois *C. auris* cases (n=856) by culture date, as of 10/8/19*

*Includes 66 colonized to clinical cases

- Clinical confirmed (n=241)
- Probable (n=4)
- Suspect (n=2)
- Screening (n=609)
Illinois *C. auris* clinical cases (N=247) by specimen type, as of 10/8/19

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood</td>
<td>78 (32%)</td>
</tr>
<tr>
<td>Urine</td>
<td>81 (33%)</td>
</tr>
<tr>
<td>Wound</td>
<td>24 (10%)</td>
</tr>
<tr>
<td>Sputum</td>
<td>14 (6%)</td>
</tr>
<tr>
<td>Bronchial Wash</td>
<td>9 (4%)</td>
</tr>
<tr>
<td>Trach. aspirate</td>
<td>10 (4%)</td>
</tr>
<tr>
<td>Tissue</td>
<td>10 (4%)</td>
</tr>
<tr>
<td>Other</td>
<td>21 (9%)</td>
</tr>
</tbody>
</table>
# Point Prevalence Surveys, August 2019

<table>
<thead>
<tr>
<th>Illinois Facility type</th>
<th>57 Facilities</th>
<th>139 Surveys</th>
<th>Median* Prevalence (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute care hospitals</td>
<td>16</td>
<td>19</td>
<td>0% (0 – 14%)</td>
</tr>
<tr>
<td>Long-term acute care hospitals</td>
<td>7</td>
<td>35</td>
<td>23% (6 – 50%)</td>
</tr>
<tr>
<td>vSNF</td>
<td>17</td>
<td>67</td>
<td>35% (0 - 83%)</td>
</tr>
<tr>
<td>Skilled nursing facilities</td>
<td>17</td>
<td>18</td>
<td>0% (0 – 8%)</td>
</tr>
</tbody>
</table>

* Most recent prevalence is used to calculate median among individual facilities.
* Prevalence is calculated as the number of colonized residents identified during PPS and those previously known infected or colonized residents per the total unit census.
Nursing Homes Are a Breeding Ground for a Fatal Fungus

Drug-resistant germs, including Candida auris, prey on severely ill patients in skilled nursing facilities, a problem sometimes amplified by poor care and low staffing.
Same Patient, Different Setting
Goals of the *C. auris* Exercise

1. Make a response plan for *C. auris* cases
   - Define plans for identification and investigation of a suspected or confirmed case of *C. auris*.

2. Build Awareness of Resources
   - Leverage resources for containment and response to novel emerging threats like *C. auris*.

3. Increase collaboration
   - Build lab, clinical and infection control capacity to successfully contain spread of *C. auris*.

Ground Rules

- Limit multitasking
- Stay open to new ideas
- Have fun
- Challenge long-held beliefs

Facilitator may request permission to interrupt
- Share your unique perspective

Adapted From ELC-HAI Meeting 2018
Group Discussion

1. Identify your area of expertise
   - Laboratory
   - Clinical treatment
   - Infection Prevention
   - Public Health Response

2. Reassort into groups of #
   At least one representative from each discipline should be present in each group

3. Identify roles:
   Each group should identify:
   - One person to complete worksheet
   - One spokesperson

Ground Rules
Moderator will coordinate breakout sessions and group discussion

Worksheets will be collected at the end of the exercise
Part 1: Identification of *C. auris*

A clinical laboratorian identifies a possible case of *C. auris*
Part 1: Identification

A clinical laboratorian identifies *Candida haemulonii* from the bloodstream. Blood cultures were drawn on September 6, 2019. She recently read a state-wide laboratory alert about *C. auris* and wants to know if she should be concerned about *C. auris* and wants to know what (if anything) she needs to do next.
Part 1: Identification - Debrief

1. Should she be concerned about *C. auris*?

2. What additional information would you want to know?

3. What fungal identification is used at your institution?

4. If the specimen source had been urine, how likely would your lab be to identify *C. haemulonii/C. auris*?

5. What should you advise her to do?

6. What should you do next?
C. auris detection has been challenging

- But, it's getting better!
  - Awareness of the organism
  - Improved access to MALDI-TOF
  - Ability to confirm at reference and public health labs

Slides courtesy of Katie Forsberg, MPH
Lab methods Updates

- FDA approvals
  - VITEK MS MALDI
  - Bruker Biotyper MALDI
  - GenMark ePlex BCID-FP panel blood culture test
- VITEK 2 8.01 update
- rt-PCR
PH Isolate Submission

• Submit to IDPH with Test requisition:
  – All *C. auris* blood isolates
  – The first *C. auris* isolate from other specimen sources (e.g., urine) for each patient stay

• IDPH forward to WI-ARLN for ID and AFST
Candida sp. surveillance

AR Lab Network Surveillance:
• Candida auris or suspect Candida auris
• Candida sp. not C. albicans

Wisconsin Surveillance:
• Candida auris or suspect C. auris
• MDR Candida sp.
• Any “unusual or hard to identify” ID Candida sp.
• Invasive C. glabrata

• Identification by MALDI-TOF
  • Bruker RUO Database
  • MicrobeNet  https://microbenet.cdc.gov/
Antifungal Susceptibility Testing

- Custom frozen microbroth dilution plates (Trek) for azoles and echinocandins

- Etest for amphotericin B

- Not FDA approved, validated by WSLH Surveillance

- Results available on request (MIC only)
  - Micafungin, Caspofungin, Anidulafungin, Fluconazole, Voriconazole, Posaconazole, Itraconazole, Isavuconazole, Amphotericin B
**Candida auris Susceptibility Testing: Tentative Breakpoints** (no current CLSI breakpoint recommendations)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Tentative MIC Breakpoint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphotericin B</td>
<td>≥2 µg/ml</td>
</tr>
<tr>
<td>Anidulafungin</td>
<td>≥4 µg/ml</td>
</tr>
<tr>
<td>Caspofungin</td>
<td>≥2 µg/ml</td>
</tr>
<tr>
<td>Micafungin</td>
<td>≥4 µg/ml</td>
</tr>
<tr>
<td>Fluconazole</td>
<td>≥32 µg/ml</td>
</tr>
<tr>
<td>Voriconizole</td>
<td>NA</td>
</tr>
</tbody>
</table>

Candida auris Colonization: culture

Axilla/Groin Swab

100 µl

SSD broth Shaker 40°C 7D

Check Daily for Turbidity

No growth @5 days

Subculture to Chromagar

No Growth 2D

Maldi-TOF

Culture shows: Candida auris

Alert

Negative
Development and Validation of a Real-Time PCR Assay for Rapid Detection of *Candida auris* from Surveillance Samples

L. Leach, Y. Zhu, S. Chaturvedi

*Mycology Laboratory, Wadsworth Center, New York State Department of Health, Albany, New York, USA*

*Department of Biomedical Sciences, School of Public Health, University at Albany, Albany, New York, USA*
WSLH adaption to extraction method

*Also validated individual tubes for admission screening specimens*
Culture/Identification - *C. auris* Surveillance Samples

**Laboratory Workflow Pre-PCR Era**

- **Surveillance Samples (Swabs & Sponges)**
  - 8/26/16
  - 3/3/17

- **Non Selective Agar (SAB+)**
  - Growth
  - MALDI

- **Selective Agar (Salt + Dextrose → Dulcitol)**
  - Growth
  - MALDI

- **Selective Broth (Salt + Dulcitol)**
  - Cloudy
  - SAB+
  - No Growth

- **Antifungal susceptibility testing for resistance profile**

**Culture + ID = 4 to 14 days**

*Welsh et al, 2017. JCM, 55:2996*
Heavy Colonization of Patient’s Skin & Mucosal Surfaces (350 colonized cases)
Heavy Colonization of Hospital Surfaces

Porous
- Linen
- Carpet
- Gowns

Non-porous
- Bed rail
- Window sill
- Bathroom surface
- Call bell
- Counter top
Prevalence of *C. auris* and other *Candida* species in Surveillance Samples

**Patients**

- *Candida glabrata*: 12.15%
- *Candida tropicalis*: 2.75%
- *Candida albicans*: 12.15%
- *Candida parapsilosis*: 3.83%
- *Candida lusitaniae*: 0.42%
- *Candida metapsilosis*: 0.17%
- *Candida guilliermondii*: 0.50%
- *Candida palmoleophila*: 0.08%
- *Candida dublieniensis*: 0.08%

**Environment**

- No Growth: 51.50%
- Bacterial: 7.15%
- Other yeasts (3.5%)
- *C. auris* (3.0%)
- *C. parapsilosis* (4.5%)
Antifungal Resistance Pattern of NY *C. auris* isolates

- **FLU** = Fluconazole
- **AMB** = Amphotericin B
- **ECHI** = Echinocandins

Pan-Resistant Isolates = 3

- ERG11
- FKS1/FKS2
NY Outbreak dominated by South Asia Clade I

Sanger Sequencing of Ribosomal genes

East Asia Clade II  South America  South Asia Clade I
Highly Sensitive (one *C. auris* CFU/PCR reaction)

Highly Specific (No cross-reaction to yeasts/molds/bacteria/parasites)

Rapid (4 h)

Drawback- Manual nature of the assay

- **Transfer**
- **Wash**
- **Heating**
- **Bead-beat**
- **rt-PCR**
- **Import Results in LIMs**
- **Release Report**

**200 µl**
A Rapid and Automated Sample-to-Result *Candida auris* Real-Time PCR Assay for High-Throughput Testing of Surveillance Samples with the BD Max Open System

L. Leach, A. Russell, Y. Zhu, S. Chaturvedi, V. Chaturvedi
Modified Workflow Post PCR Era

PCR

Negative
- No Further Test

Positive
- Culture (Dulcitol Broth)
  - MALDI
    - C. auris

Significant cut down on
- Efforts
- Supplies
- $ amount
Candida auris Cases in New York State by Month, May 2013 - April 2019

Month of First Clinical Culture/Positive PCR of Candida auris
Summary

• Total Surveillance samples tested 20,661 including 15,026 point prevalence (10,521 swabs & 4,505 sponges), & 5,635 admission screening

• Total Clinical cases 415 & colonized cases 593 as of October 21, 2019. Approximately 11% of colonized cases converted into clinical, a concerning factor.

• Successful use of one swab of Nares/Axilla/Groin for all PPS (January 2018)

• Development of PCR assays (manual & automated) and their impact on infection control practices

• Relatively heavier colonization of nares than axilla/groin

• Predominance of South Asia Clade I

• Isolation of three Pan-resistant isolates
Part 2: Treatment of *C. auris* infection

ARLN lab confirms that the *C. haemulonii* was in fact *C. auris*
Part 2: Treatment of *C. auris* infection

You Learn That...

The ARLN lab confirms that the *C. haemulonii* isolate is in fact *C. auris*. Antifungal susceptibility testing results from ARLN lab are not yet available. Results are reported to submitting laboratory and communicated to clinical staff.

September 13, 2018
Part 2: Treatment - Debrief

1. What should clinicians do next?
2. What should Infection Preventionist do next?
3. What should laboratorians do next?
Part 2: Summary – Report Out
What Is Known About *Candida auris*

Suzanne F. Bradley, MD¹,²

*Author Affiliations*

*JAMA.* Published online September 6, 2019. doi:10.1001/jama.2019.13843

*Candida auris* is a new species that was reported in Asia as a rare cause of ear infections in 2009; it had not been found among large repositories of yeast isolates collected prior to 2013.¹,² However, the widespread dissemination of *C auris* is not due to a single strain. For reasons that are not clear, multiple strains, called *clades*, have emerged independently in various parts of the world.¹,² Cases of *C auris* have been identified in 33 countries across 5 continents.¹-³
Treatment of Infections

- Consultation with an infectious disease specialist is highly recommended when caring for patients with *C. auris* infection.
- Adults and children ≥ 2 months of age

<table>
<thead>
<tr>
<th>Echinocandin Drug</th>
<th>Adult dosing</th>
<th>Pediatric dosing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anidulafungin</td>
<td>loading dose 200 mg IV, then 100 mg IV daily</td>
<td>not approved for use in children</td>
</tr>
<tr>
<td>Caspofungin</td>
<td>loading dose 70 mg IV, then 50 mg IV daily</td>
<td>loading dose 70mg/m²/day IV, then 50mg/m²/day IV (based on body surface area)</td>
</tr>
<tr>
<td>Micafungin</td>
<td>100 mg IV daily</td>
<td>2mg/kg/day IV with option to increase to 4mg/kg/day IV in children 40 kg</td>
</tr>
</tbody>
</table>
Resistance: *C. auris*

- 88% Azoles
- 34% Polyenes
- 2% Echinocandins

- 33% multidrug-resistant
- 2 pan-resistant cases found in 2019

Slides courtesy of Katie Forsberg, MPH
Resistance Among 254 Clinical IL Isolates

12% Azoles
1% Polyenes
2% Echinocandins

34 (13%) Any resistance
3 (1%) resistant to Fluconazole and Amphotericin B
Development of High-Level Echinocandin Resistance in a Patient With Recurrent *Candida auris* Candidemia Secondary to Chronic Candiduria

Mark J. Biagi,1 Nathan P. Wiederhold,3,9 Connie Gibas,2 Brian L. Wickes,3 Victoria Lozano,3 Susan C. Bleasdale,4 and Larry Danziger1

1University of Illinois at Chicago College of Pharmacy, Department of Pharmacy Practice; 2University of Texas Health Science Center at San Antonio, Department of Pathology and Laboratory Medicine, Fungus Testing Laboratory; 3University of Texas Health Science Center at San Antonio, Long School of Medicine, Department of Microbiology, Immunology, and Molecular Genetics; 4University of Illinois at Chicago College of Medicine, Department of Medicine

- S639P point mutation region of FKS1 (*C. albicans* and)
- S639P mutation region of FKS1
- Prolonged micafungin exposure
- Subinhibitory urine concentrations
- Chronic indwelling urinary catheter (changed 4 times)
Figure 1. Timeline of Antifungal Therapy and Microbiologic Data. Abbreviations: BCx, blood culture; EC-R1: echinocandin-resistant strain isolated on day 97; EC-S1: echinocandin-susceptible strain isolated on day 27; EC-S2: echinocandin-susceptible strain isolated on day 29; q6h: every 6 hours; UCx: urine culture. *Patient previously received micafungin at an outside hospital for an unknown duration prior to the initial presentation at our institution (day 0).
Management of Infections

Infection Source Considerations

- **Urinary penetration**
  - Fluconazole has good penetration but increased resistance
  - Echinocandins have poor penetration

- **Considerations**
  - Flucytosine good urinary penetration
  - Amphotericin B
    - Bladder irrigation
  - New drugs
    - Fosmanogepix
Management of Infections and Colonization

- CDC does not recommend treatment of *C. auris* identified from noninvasive sites, when there is no evidence of infection

- Prevention of invasive infections
  - Appropriate care of medical devices
  - Meticulous skin preparation for surgical procedures
  - Antibiotic stewardship

- Infection control recommendations
Pan-resistance – all three classes

- CDC-confirmed pan-resistant *C. auris* cases in NY
- Cases unrelated
- Developed resistance on treatment
- No pan-resistance found among screened contacts
- Pan-resistance has also been reported from a few other countries

Slides courtesy of Katie Forsberg, MPH
Patient characteristics
Colonization to infection data
Resistance patterns in NYS
Pan-resistant cases
Treatment challenges
Antifungal stewardship
Part 3: Case History/Controlling Spread

The infection preventionist at the facility provides the case patient history.
Part 3: Case History

Hospitalized abroad for five weeks:
- The patient was in India visiting family members when she developed symptoms of a stroke.
- She was immediately admitted to the intensive care unit (ICU) in a hospital in India, where she underwent numerous complicated neurosurgical procedures and received lots of antibiotics.
- After being moved to a step-down unit for 3 weeks,
- Following 10 days in the step-down unit, she was transferred directly to a U.S. acute care hospital.
- She has a tracheostomy and is ventilator-dependent and has a urinary catheter.

Direct transfer to a U.S. short-stay acute care hospital for one week:
- On August 26, she was directly admitted to a U.S. short-stay acute care hospital (ACH).
- She was not initially on Contact Precautions.
- She had two roommates during the first week of the admission.
- On ACH day 7 (September 3), a sputum specimen revealed carbapenem-resistant Enterobacteriaceae (CRE). On ACH day 10 (September 6), *C. auris* was identified in a blood culture.
Part 3: Controlling Spread

You Learn That...

**Direct transfer to an LTACH:**
- On September 9, she was transferred to a long-term acute care hospital (LTACH). The hospital communicated to the LTACH about CRE, but they had not yet known about C. auris.
- On September 13, you received the AR Lab Network notification that this patient was confirmed to have C. auris.

**Infection Control:**
- **ACH** - 360 beds (four 20-bed units/floor).
  - Adequate adherence to hand hygiene (HH) and Contact Precautions
  - Variable use of sporicidal agents for environmental cleaning.
- **LTACH** - 50 beds (25 beds/floor)
  - HH compliance 40%, limited ABHR and PPE
  - EVS staff member cleaning a Contact Precautions room and returning to the cart for supplies without changing gown and gloves.
  - Wound care, PT, RT, OT staff are shared between patients on both floors.
  - Index Patient had a roommate due to lack of available single rooms.
Part 3: Controlling Spread - Debrief

1. Who notifies the facility the patient was discharged to of *C. auris* result?

2. What actions should the short-stay ACH take to prevent spread of *C. auris* spread?

3. What actions should LTACH take to prevent spread of *C. auris*?

4. Do you recommend screening to assess for *C. auris* at the ACH and/or LTACH?
   a) If yes, who do you recommend prioritizing for screening?

5. Do you anticipate challenges in implementation of these recommendations at either facility? If so, what are they?
Part 3: Summary – Report Out
Containment steps

- Report to health departm
- Infection control
- Screen
- Lab surveillance
Case Report Form

Completed By: __________________________ Date of completion: __/__/____

PATIENT INFORMATION

Name: ________________________________ Date of Birth: __/__/____

MR#: ________________________________ Sex: □ Female □ Male

Facility Name: ________________________ Date of admission: __/__/____

Admission source: □ Home □ Facility, specify: ________________________________

Reason for admission: ______________________________________________________

Date of discharge: __/__/____

Reason for discharge: □ expired □ hospice □ home □ transferred (facility name): __________

Past Travel History:

Has the patient recently travelled to another country? □ No □ Yes, specify: __________

If yes, did the patient receive healthcare there? □ No □ Yes, when? __/__/____

CLINICAL INFORMATION

List all hospitalization dates at your facility and any other known facilities [including facilities or nursing homes] in the 6 months prior to C. auris specimen collection:

Facility name: ________________ Admission date: __/__/____ Discharge: __/__/____

Facility name: ________________ Admission date: __/__/____ Discharge: __/__/____

Candida auris, clinical Case Report

State Case Number: 19-168522

Expand All

Demographic - Add or update person current name, address, phone, identification information.

General Illness - Medical Background info which includes name of Physician, hospitalization status, current diagnosis...

Medical History - Add or update patients medical history information.

Healthcare Facility Encounter - Add or update healthcare facility encounter information.

Laboratory Tests - Add or update laboratory test information.

Medication Information - Add or update patients medication information.

Epidemiologic Data - Add or update all epidemiologic data.

Reporting Source - Add or update reporting source information.

View Logs - Review user comment and system generated activity logs.
XDRO Registry

▪ Purpose
  – Improve MDRO surveillance
  – Improve inter-facility communication
▪ What’s in there?
  – CRE
  – *Candida auris*
  – Carbapenemase-producing *Pseudomonas aeruginosa* *
  – Carbapenem-resistant *Acinetobacter baumannii* *

* Entered by public health
Facility Level Prevention Strategies: Back to Basics

- Hand Hygiene
- Personal Protective Equipment & Precautions
- Environmental Cleaning & Disinfection

Slides courtesy of Katie Forsberg, MPH
Infection Prevention and Control

▪ Single-patient room using Standard AND Contact Precautions.
▪ Emphasizing adherence to hand hygiene.
▪ Cleaning and disinfecting patient care environment and reusable equipment with recommended products.
▪ Inter-facility communication.
▪ Screening contacts.
▪ Conduct surveillance for new cases to detect ongoing transmission.
Environmental Cleaning

- CDC recommends use of an Environmental Protection Agency (EPA)-registered hospital-grade disinfectant effective against *Clostridioides difficile* spores (List K)

- Research found that the following products led to a substantial reduction (≥4 log reduction) of *C. auris*:
  - Oxivir Tb
  - Clorox Healthcare Hydrogen Peroxide Cleaner Disinfectant
  - Prime Sani-Cloth Wipe
  - Super Sani-Cloth Wipe
Frequent IC challenges identified during on-site assessments

- Gaps in adherence to hand hygiene, limited access to alcohol-based hand rubs inside and outside of resident rooms
- Limited access to personal protective equipment (PPE) and minimal use of Contact Precautions
- Improper product selection, use and frequency to reduce environmental surface contamination within shared rooms
- Inadequate cleaning/disinfection of equipment shared between residents
- Incomplete communication of MDRO history or risk factors during facility transfers
Micro lookback

- Review past microbiology records (as far back as 2015, if possible) to identify cases of confirmed or suspected C. auris.

*Candida auris:* A drug-resistant yeast that spreads in healthcare facilities
A CDC message to laboratory staff
Speciating Yeast

- Sterile site isolates may only be performed by request
- Species from non-sterile isolates often not identified

~50%

Only about 50% of clinical cases are from blood

Slides courtesy of Katie Forsberg, MPH
Point Prevalence Surveys

- Screen every patient on a given unit or floor where transmission is suspected
- Testing through CDC’s AR Lab Network
- Composite swab of the patient’s bilateral axillae and groin
- While awaiting screening results, place high-risk patients in single rooms on Contact Precautions
Infection prevention & control challenges
  – Single rooms
  – Patient transfers
Part 4: Follow-Up

Monitor Infection Control recommendations and supports additional screening to ensure your recommendations are effective.
### Part 4: Transmission Screening and Point Prevalence Surveys

#### You Learn That...

**Contact Screening:**
- 1 of 9 patients tested screen positive for *C. auris* colonization

**PPS:**
- Expanded to 20 bed unit
- No new cases are identified.

<table>
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<tr>
<th>ACH</th>
<th>LTACH</th>
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| **PPS #1- Floor A:**  
- 2 of 24 patients tested screen positive.  
  - One roommate; one residing in room across the hall.  
**PPS #2- Whole house:**  
- 47 of 50 patients are screened:  
  - 2 patients are positive for *C. auris* on the same floor as the index patient  
**PPS #3- Floor A:**  
- 24 patients are screened:  
  - No new cases are identified  
**PPS #3- Floor A:**  
- 25 patients are screened  
  - No new cases are identified |
Part 4: Follow-up- Debrief

Group Discussion

1. Do you recommend additional screening at the ACH?
2. What are next steps (interventions/screening) for the ACH?
3. Do you recommend additional screening at the LTACH?
4. What are the next steps (interventions/screening) for the LTACH?
5. How can you evaluate whether infection control practices are improving?
Part 4: Summary – Report Out
Recommendations for screening

Healthcare exposure

 Colonized with other MDRO

Healthcare abroad in past year

Slides courtesy of Katie Forsberg, MPH
Screening Algorithm e.g.

- Who?
- How?
- For How Long?

High-Risk patient? (e.g., healthcare abroad, NSF or LTACH, MDRO colonized)

Is the patient trached or vent-dependent?

Empiric Isolation

Empiric Isolation and screen (discontinue if test negative)

Isolation for Other Reason

Continue Isolation protocol as indicated
Periodic point prevalence surveys in LTACHs and vSNFs

- To assess prevalence
- To assess effectiveness on IC interventions
- Conducting periodic PPS at an LTACH bordering a high prevalence area for early detection

Slides courtesy of Katie Forsberg, MPH
Screening: nares, axillae and groin

Back to Basics
  – Portable equipment
  – ATP testing

Decolonization
  – Role of host factors
  – Research activities
NYSDOH/Wadsworth Center

- Epidemiology
  - Successes: High level of awareness, relative geographic containment, cessation of transmission at key healthcare facilities, lack of transmission among concerning patients groups (oncology, pediatrics)
  - Future activities & challenges:
    - Admission screening?
    - Laboratory capacity
Resources

- CDC
  - https://www.cdc.gov/fungal/candida-auris/health-professionals.html
- IDPH
- CDPH
  - https://www.chicagohan.org/cauris
  - https://www.chicagohan.org/hai
  - https://www.chicagohan.org/antimicrobialstewardship