Candida auris: An Enigmatic Fungal Pathogen of Global Concern

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Disclosure

Rebecca is employed by Diversey—A Solenis Company. The company pays her expenses to attend this meeting & create educational content (salary). Diversey has had no input into this presentation from a commercial interest.

Objectives

01 Distinguish *Candida auris* (CA) from other Candida species

02 Discuss the epidemiology and current prevalence of CA

03 Understand why CA is an emerging threat

04 Review recent CA outbreaks

05 Summarize CA outbreak IPC recommendations

01

Background: Candida species/auris

Laboratory Basics

Fungi have two basic growth forms—molds and yeasts:

- Molds generally have a “fuzzy” appearance on lab media
- Yeasts appear more like a bacterial colony on media: soft, opaque cream color, 1 – 3 mm in diameter

Mold

Yeast

Candida species

Most common cause of fungal infections worldwide:

- *C. albicans* – most common Candida pathogen
- *C. parapsilosis*
- *C. glabrata*
- *C. tropicalis*
- *C. guilliermondii*
- *C. dubliniensis*

Generally called: non-albicans Candida, or Candida species- not C. albicans

Candida species as a cause of HAIs

Top 15 HAI Pathogens Reported to NHSN, Adults, 2018-2021

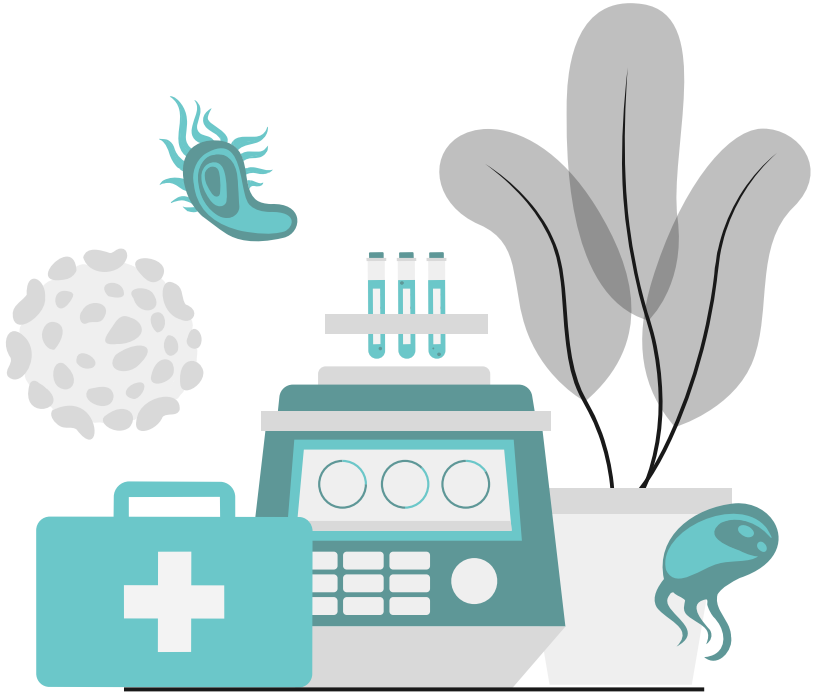
When analyzed to the genus level, Candida species ranked #6 (7.5%)

Pathogen	# Pathogens	% Pathogens	Rank
Escherichia coli	73,556	16.2	1
Staphylococcus aureus	51,131	11.3	2
Enterococcus faecalis[2]	39,129	8.6	3
Select *Klebsiella* spp.	38,496	8.5	4
Pseudomonas aeruginosa	36,004	7.9	5
Coagulase-negative staphylococci	32,276	7.1	6
Enterobacter spp.	18,431	4.1	7
Enterococcus faecium[2]	16,904	3.7	8
Candida albicans[2]	16,458	3.6	9
Proteus spp.	13,953	3.1	10
Bacteroides spp.	11,602	2.6	11
Viridans group streptococci	9,962	2.2	12
Other *Candida* spp.[2]	9,803	2.2	13
Other *Enterococcus* spp.[2]	9,091	2.0	14
Candida glabrata[2]	7,622	1.7	15
Other pathogen	68,522	15.1	
Total	452,940	100.0	

https://www.cdc.gov/nhsn/hai-report/data-tables-adult/table-3.html

CA Background

- First described in 2009 in an ear isolate in Tokyo, Japan but the earliest known case was retrospectively identified in South Korea and dated back to 1996
- 5 distinct clades
  - Clade: A taxonomic group of organisms classified together on the basis of homologous features traced to a common ancestor – dictionary.com)



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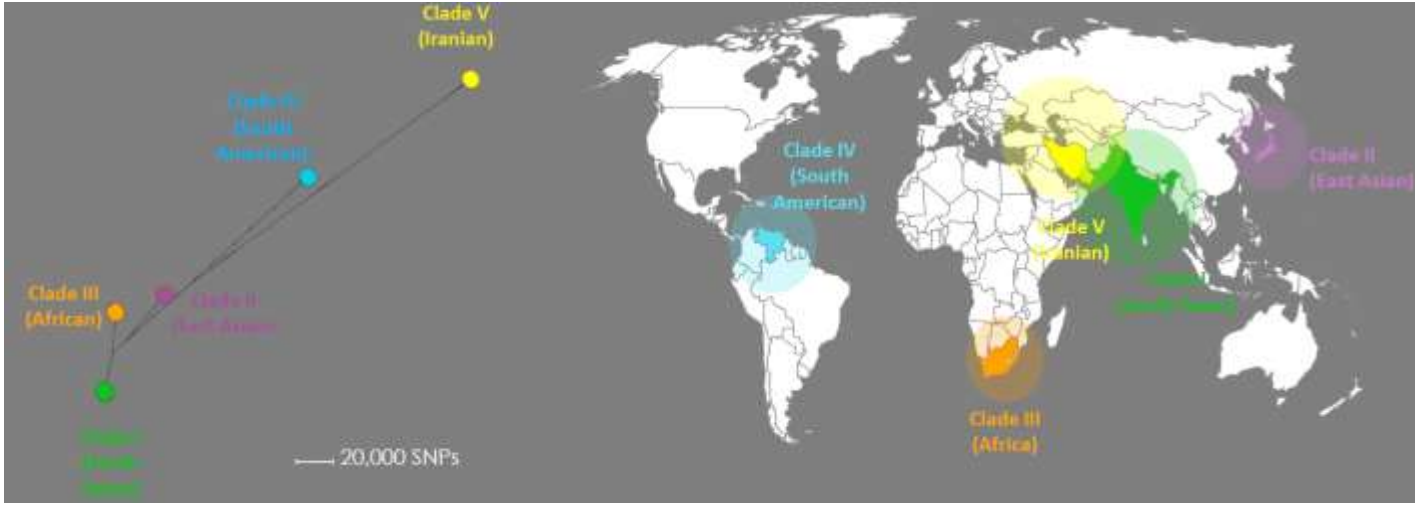
CA Clades & Worldwide Distribution

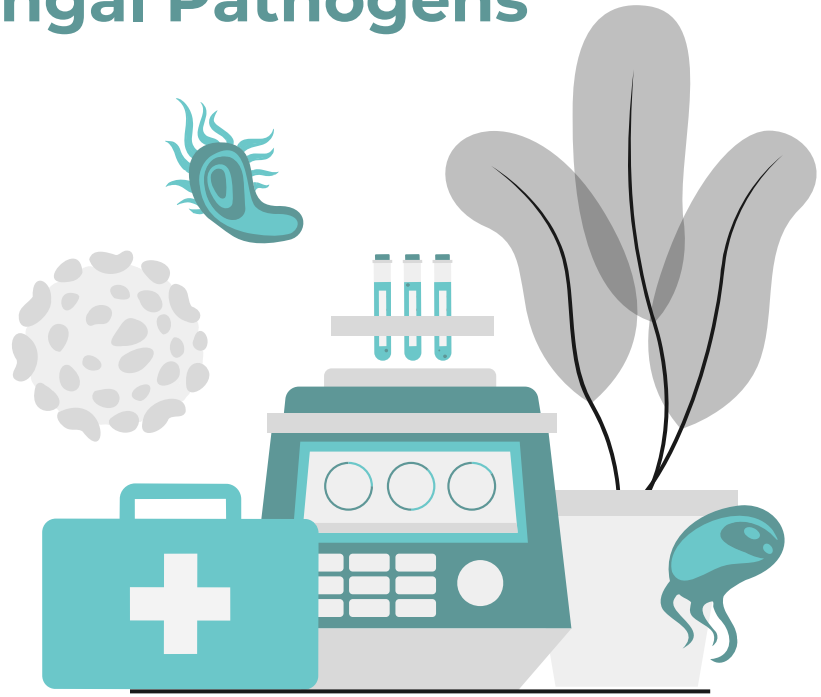


Around the world, CA has been reported in at least 50 countries on 6 continents

Global Risk of Fungal Pathogens

WHO: CA is under-recognized global threat compounded by rapid spread, emergence of antifungal resistance and limited access to quality diagnostics and treatment.

Critical group
Cryptococcus neoformans
Candida auris
Aspergillus fumigatus
Candida albicans



WHO fungal priority pathogens list to guide research, development and public health action: 2022

COVID-19 Impacts on

18 Antimicrobial-Resistant Bacteria and Fungi

Threat Estimates

The following table summarizes the latest national death and infection estimates for 18 antimicrobial-resistant bacteria and fungi. The pathogens are listed in three categories—urgent, serious, and concerning—based on level of concern to human health identified in 2019.

	Resistant Pathogen	2017 Threat Estimate	2018 Threat Estimate	2019 Threat Estimate	2017-2019 Change	2020 Threat Estimate and 2019-2020 Change
URGENT	Carbapenem-resistant *Acinetobacter*	8,500 cases 700 deaths	6,300 cases 500 deaths	6,000 cases 500 deaths	Stable*	7,500 cases 700 deaths **Overall: 35% increase*** **Hospital-onset: 78% increase***
URGENT	Antifungal-resistant *Candida auris*	171 clinical cases†	329 clinical cases	466 clinical cases	Increase	754 cases **Overall: 60% increase**
URGENT	*Clostridioides difficile*	223,900 infections 12,800 deaths	221,200 infections 12,600 deaths	202,600 infections 11,500 deaths	Decrease	Data delayed due to COVID-19 pandemic
URGENT	Carbapenem-resistant Enterobacterales	13,100 cases 1,100 deaths	10,300 cases 900 deaths	11,900 cases 1,000 deaths	Decrease*	12,700 cases 1,100 deaths Overall: Stable* **Hospital-onset: 35% increase***
URGENT	Drug-resistant *Neisseria gonorrhoeae*	550,000 infections	804,000 infections	942,000 infections	Increase	Data unavailable due to COVID-19 pandemic
SERIOUS	Drug-resistant *Campylobacter*	448,400 infections 70 deaths	630,810 infections	725,210 infections	Increase	Data delayed due to COVID-19 pandemic‡ 26% of infections were resistant, a 10% decrease
SERIOUS	Antifungal-resistant *Candida*	34,800 cases 1,700 deaths	27,000 cases 1,300 deaths	26,600 cases 1,300 deaths	Decrease*	28,100 cases 1,400 deaths **Overall: 12% increase*** **Hospital-onset: 26% increase***
SERIOUS	ESBL-producing Enterobacterales	197,400 cases 9,100 deaths	174,100 cases 8,100 deaths	194,400 cases 9,000 deaths	Increase*	197,500 cases 9,300 deaths **Overall: 10% increase*** **Hospital-onset: 32% increase***
SERIOUS	Vancomycin-resistant Enterococcus	54,500 cases 5,400 deaths	46,800 cases 4,700 deaths	47,000 cases 4,700 deaths	Stable*	50,300 cases 5,000 deaths **Overall: 16% increase*** **Hospital-onset: 14% increase***

CDC, 2022 Special Report: Covid-19, US Impact on Antimicrobial Resistance

60% overall CA Increase from 2019 to 2020!

02

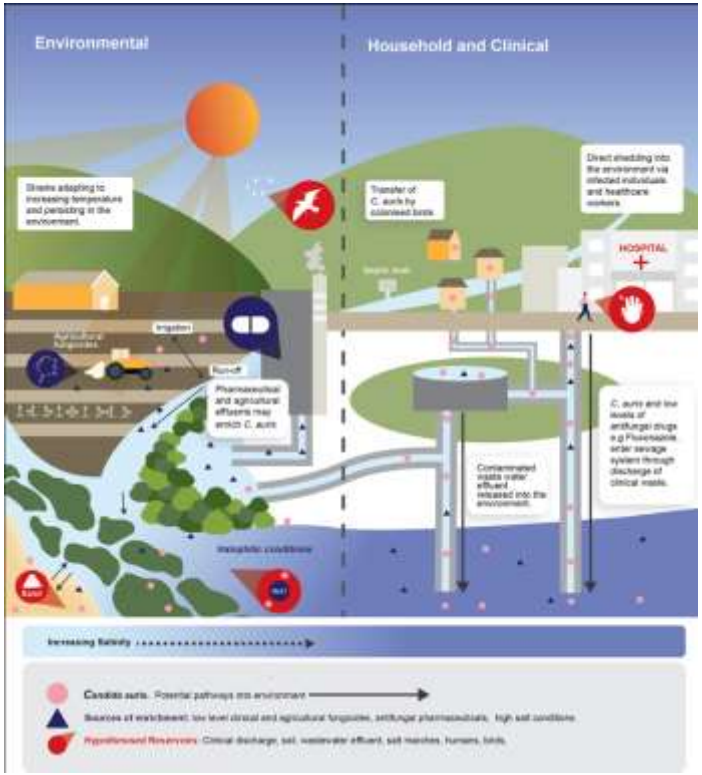
Epidemiology & Prevalence

Define “emerging” infectious diseases/pathogen

The National Institute of Allergy and Infectious Diseases (NIAID) defines “emerging infectious diseases/pathogens” as those “that have newly appeared in a population or have existed but are rapidly increasing in incidence or geographic range.”

Where Did It Come From?

- Prior to being recognized as a human pathogen, CA likely existed as a plant saprophyte in wetlands
- CA has the unique ability to grow in:
  - Higher temperatures and levels of humidity
  - High salinity
- First environmental isolates came from a sandy beach and a salt marsh wetland in the Andaman Islands, India and from an estuary in Colombia
- Indicates that CA existed as an environmental fungus



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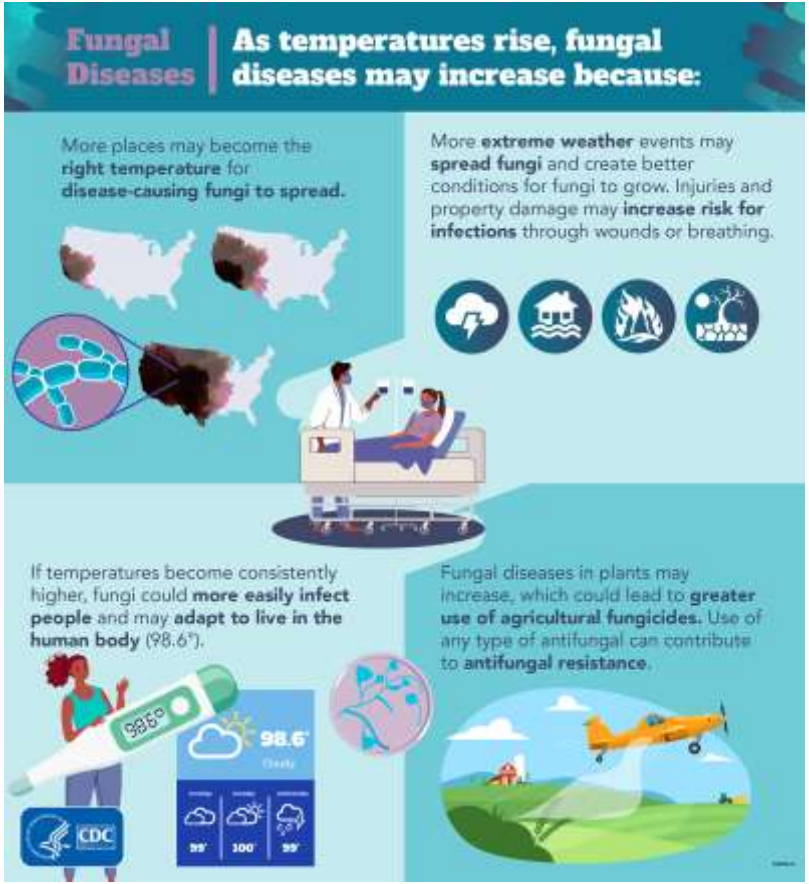
Global Warming Hypothesis

Increase in global warming led to simultaneous emergence of thermo-tolerant CA in different geographical locations

Other factors include:

- Global human migration
- Poor hygiene
- High population densities
- Use of fungicides in agriculture (contributes to antifungal resistance)

Akinbobola 2023



https://www.cdc.gov/fungal/climate.html

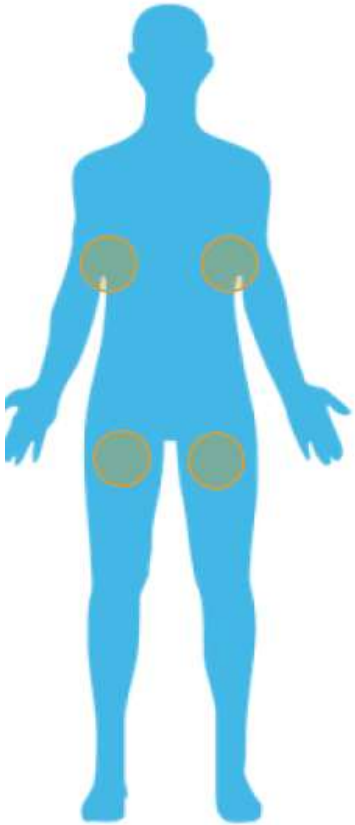
Colonization

Commonly reported sites of colonization include:

- Skin, especially groin and axilla areas
- Mucosal surfaces of the gastrointestinal and genitourinary tract
- Respiratory tract (oropharynx, nose)
- Ear (named for the latin word for ear “auris”)
- Tips of central venous catheters

In areas of high CA prevalence, colonization rates of 2.5%-33.9% have been reported

* Contributes to its ability to spread easily in health care settings



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C. auris Epidemiology, CDC Mycotic Diseases Branch, SHEA Webinar 2023

Infections

Individuals colonized or infected with CA frequently have comorbidities such as:

- Diabetes
- Bloodstream infection and multi-organ failure
- Pulmonary diseases/pneumonia
- Chronic or acute kidney failure
- Immunosuppressive conditions
- Solid tumour/malignancies
- Cardiovascular/hypertension
- Chronis otitis/media
- Gastrointestinal disease

Nearly 10% of CA-colonized patients develop infection, particularly those in the ICU setting (on mechanical ventilation and with invasive devices)
Overall crude mortality rate of 30-60%

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Infections

Non-invasive CA infections include:
- Respiratory tract
- Urinary tract
- Wound infections
- Skin abscesses (often related to catheters)
- Otitis externa

Invasive CA infections include:
- Bloodstream infection
- Pericarditis
- Myocarditis
- Meningitis
- Osteomyelitis

* CA is thermotolerant- grows optimally at 98°F, but it can remain viable at 107°F. This gives CA the ability to cause invasive infections and tolerate fever

Infections

Epidemiology of Candida infections is changing:

- Candida albicans is the most common cause of candidemia and invasive candidiasis
- >50% of all infections are now caused by non-albicans species
- Likely due to the increasing use of antifungal drugs for prophylaxis and treatment which has resulted in the selection of Candida species with reduced susceptibility to antifungal drugs

*CA has been linked to been link to major outbreaks of invasive infection in healthcare facilities around the world

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CA Prevalence in Europe

RED- CA outbreak countries with inter-facility spreading or endemicity (Spain, Italy, Greece, UK)

YELLOW- Sporadic outbreaks with or with none or limited inter-facility spreading

BLUE- Sporadic locally acquired cases or an unknown or imported origin

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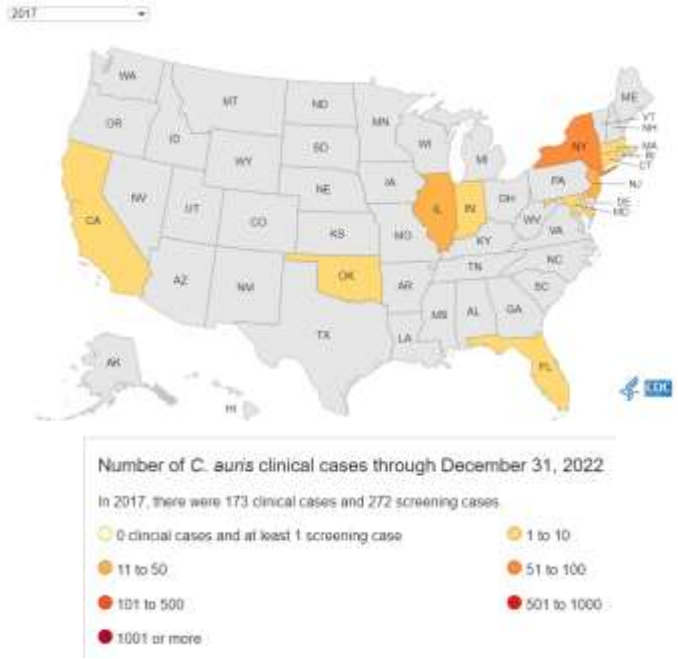
Prevalence in the US

2017



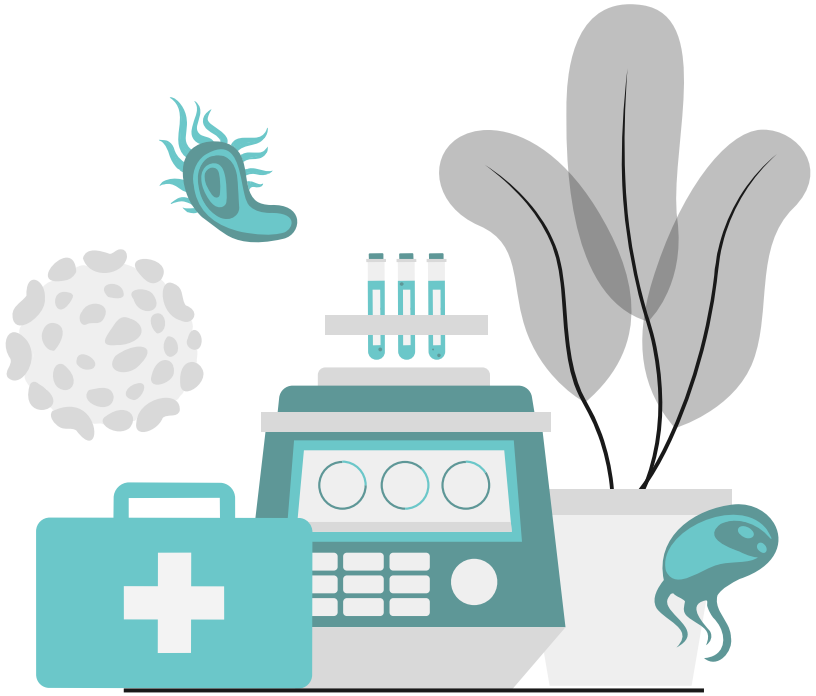
Recent 12 months

Prevalence in the US

Cases:
2018-2019: 44% increase
2019-2020: 59% increase
2020-2021: 95% increase

In 2022, Nevada was the most affected state followed by California, Florida and New York

CA has been detected in over 50% of American states



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Candida auris is a nationally notifiable condition and is reportable in many states. Laboratories that identify cases of CA should report cases immediately to the state or local health department.

CA is on North Dakota's Mandatory Reportable Infectious Conditions list!

NORTH Dakota | Health & Human Services

Mandatory Reportable Infectious Conditions

If highlighted red, report immediately: 800-472-2180 or 701-328-2378

Report all other conditions within one business day

- Acute Flaccid Myelitis
- Alpha-gal Syndrome
- Anaplasmosis
- Anthrax
- Arboviral infection (other)
- Babesiosis
- Botulism
- Brucellosis
- Campylobacteriosis
- *Candida auris*
- Carbapenem-resistant organisms
  - *Enterobacterales*
  - *Pseudomonas aeruginosa*
  - *Acinetobacter baumannii*
- Hepatitis D
- Hepatitis E
- HIV/AIDS infection[2]
- Influenza[3]
  - Pediatric deaths
  - Suspect novel, PCR influenza A unsubtypable
- Jamestown Canyon virus disease
- Laboratory incidents with possible release of category A agents or novel influenza virus
- La Crosse encephalitis
- Legionellosis
- Leptospirosis
- Respiratory Panel Results[3]
- Respiratory Syncytial Virus[3]
  - Pediatric deaths
- Rocky Mountain spotted fever
- Rubella
- Salmonellosis
- SARS-CoV-2[3]
  - Pediatric deaths
- Scabies outbreaks in institutions
- Shigellosis
- Smallpox
- *Staphylococcus aureus*
  - Vancomycin-resistant and intermediate resistant (VRSA and VISA) – any site

https://www.cdc.gov/fungal/fungal-disease-reporting-table.html

Case Definitions 2023
National Notifiable Diseases Surveillance System (NNDSS)

Screening Case

Detection of C. auris in a specimen from a swab obtained for the purpose of colonization screening using either culture or validated culture-independent test (e.g., nucleic acid amplification test [NAAT])

Clinical Case

Detection of C. auris in a clinical specimen obtained during the normal course of care for diagnostic or treatment purposes using either culture or a validated culture-independent test (e.g., NAAT)

https://ndc.services.cdc.gov/case-definitions/candida-auris-2023/

03

Why is *Candida auris* an emerging threat?

Why Are We Concerned?

Morbidity and Mortality

Potential to Cause Outbreaks in Healthcare Settings

Laboratory Identification

Disinfection Challenges

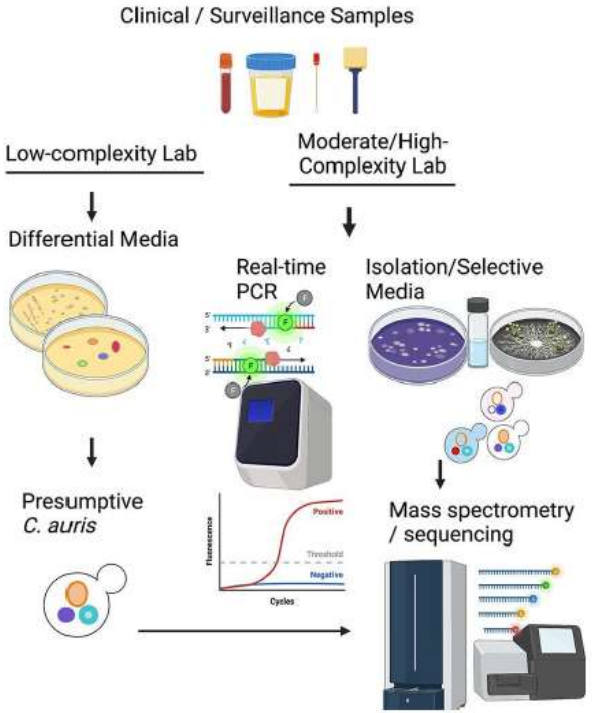
Resistance to Antifungals

Laboratory Identification

Cultures based methods take several days to result and lack sensitivity (50% of invasive candida infections are culture negative)

In clinical laboratories that rely on biochemical-based testing for yeast identification, up to 90% of CA isolates can be misidentified as other Candida species or other yeasts

Matrix-Assisted Laser Desorption Ionization-Time of Flight Mass Spectrometry (MALDI-TOF MS) systems are widely used for the rapid and accurate identification of bacteria, mycobacteria and certain fungal pathogens in the clinical microbiology laboratory-
*had to add isolates from the 4 major clades to their databases



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Laboratory Identification

GOLD STANDARD
DNA sequence analysis- this determines the exact sequence of nucleotides or bases in a DNA molecule (D1/D2 and ITS sequencing)

Other methods such as whole genome sequencing (WGS) can further delineate local clusters to inform the source of transmission

Molecular sequencing of ribosomal DNA loci further enables clade differentiation

https://www.pacb.com/blog/the-evolution-of-dna-sequencing-tools/

Geremia 2023
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Antibiotic Resistance Laboratory Network (ARLabnetwork)

Purpose is to close the gap between local lab capabilities and the data needed to combat antimicrobial resistance by providing:

- Comprehensive lab capacity and infrastructure for antimicrobial-resistant pathogens
- Cutting-edge technology, like DNA sequencing
- Data to drive response and prevent infections

https://www.cdc.gov/drugresistance/ar-lab-networks/domestic.html

Anti-Fungal Susceptibility Worldwide

3 main classes of FDA approved antifungals:
Azoles, Polyenes, Echinocandins

Echinocandins are the first-line therapy for invasive Candida infections and most CA infections.

*CA is often resistant to at least one class of antifungals

Azoles- 87-100% resistance to fluconazole, susceptibility to other azoles vary
Polyene- moderate resistance to Amphotericin B (8-35%)

4% of CA isolates are **pan-resistant** (reported in U.S, India, South America)

Resistance rates in different countries and different health care settings vary considerably and are mainly due to different clade distributions in different settings

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Anti-Fungal Susceptibility Worldwide

Features	Clade I (South Asian)	Clade II (East Asian)	Clade III (South African)	Clade IV (South American)	Clade V (Iranian)
Antifungal Resistance Profile	Resistant to fluconazole, echinocandins, amphotericin B Pan-resistance identified in some strains[30]	Usually susceptible to antifungal drugs[24]	Resistant to fluconazole Cross-resistant to echinocandins, amphotericin B Pan-resistance identified in some strains[30]	Resistant to fluconazole Cross-resistant to echinocandins, amphotericin B Pan-resistance identified in some strains[30] Note: the first isolates in Ontario were all clade IV and all were pan-susceptible	Resistant to fluconazole[31]

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Anti-Fungal Susceptibility United States

90% of CA isolates resistant to fluconazole

30% of CA isolates resistant to amphotericin B

2-5% of CA isolates resistant to echinocandins

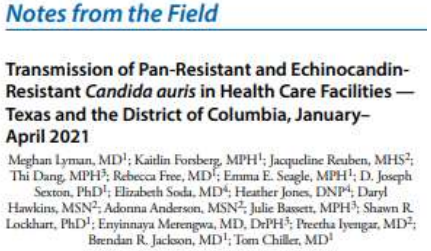
*In the New York-New Jersey area where 55% of all U.S. isolates occur:
99.8% fluconazole-resistant
50% amphotericin B-resistant

AR Lab Network reported pan-resistant strains:
4 cases before 2020
6 cases in 2020
7 cases in 2021
Identified in Texas, NYC, District of Columbia


The New York Times

Outbreaks of Untreatable, Drug-Resistant Fungus Spread in 2 Cities

For the first time, the C.D.C. identified several cases of Candida auris that were resistant to all drugs, in two health facilities in Texas and a long-term care center in Washington, D.C.


Notes from the Field

Transmission of Pan-Resistant and Echinocandin-Resistant *Candida auris* in Health Care Facilities — Texas and the District of Columbia, January–April 2021

Meghan Lyman, MD[1]; Kaitlin Forsberg, MPH[1]; Jacqueline Reuben, MHS[2]; Thi Dang, MPH[3]; Rebecca Free, MD[1]; Emma E. Seagle, MPH[1]; D. Joseph Sexton, PhD[1]; Elizabeth Soda, MD[4]; Heather Jones, DNP[4]; Daryl Hawkins, MSN[2]; Adonna Anderson, MSN[2]; Julie Bassett, MPH[3]; Shawn R. Lockhart, PhD[1]; Enyinnaya Merengwa, MD, DrPH[3]; Preetha Iyengar, MD[2]; Brendan R. Jackson, MD[1]; Tom Chiller, MD[1]

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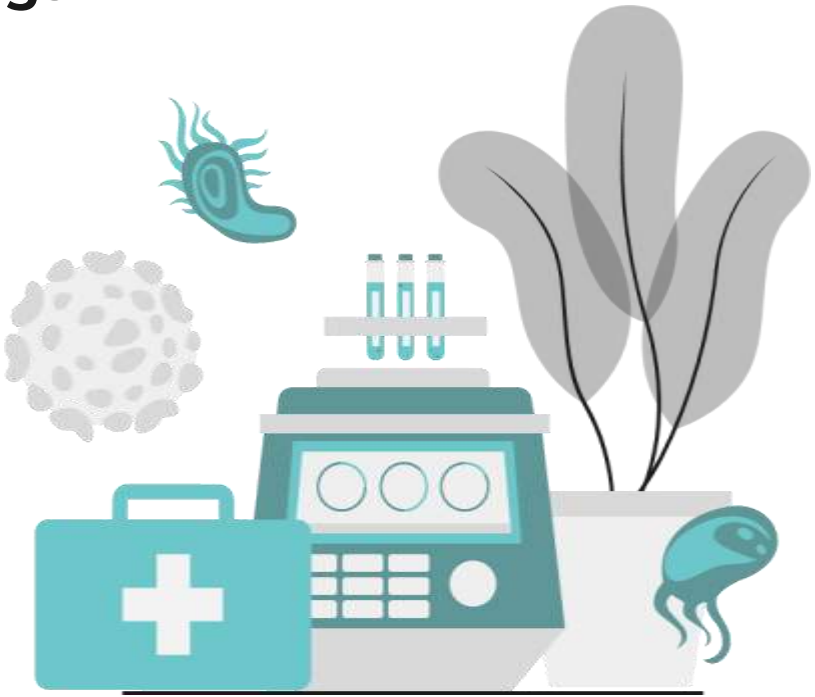
Factors Affecting Spread in Health Care Settings

- Commonly reported sites of colonization include the skin (especially the groin and axilla areas)- Continuous carriage for more than a year after initial isolation of C. auris has been documented
- CA remains viable on surfaces for a prolonged period of time and is shown to survive for up to 4 weeks despite surface decontamination and remain viable on inanimate surfaces for several months
- CA can withstand many common hospital disinfectants



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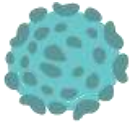


Cleaning and Disinfection

Quaternary ammonium chemistries (QACs) don't work, but are the most widely used in healthcare by EVS (Han 2021).

Not all "fungicidal" disinfectants are effective against CA- check!

Important to adhere to manufacturers instructions for dilution and contact time to ensure efficacy

Reference "List P" for products with EPA approved claims against CA

https://www.epa.gov/pesticide-registration/list-p-antimicrobial-products-registered-epa-claims-against-candida-auris

Cleaning and Disinfection

Patient Care Environment and Equipment

Perform thorough daily and terminal cleaning and disinfection of the patient's room and other areas they received care (i.e. physiotherapy, imaging etc.)

Dedicate equipment and supplies (e.g., stethoscopes, glucometers, temperature probes, blood pressure cuffs), and other shared equipment (e.g., ventilators, Hoyer lifts, physical therapy equipment) to CA positive patients

Clean and disinfect all supplies and equipment immediately after use and dispose of unused, disposable supplies after patient discharge.

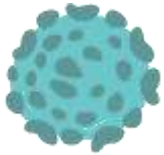
*** A List P product should be used by BOTH:**

Environmental Services

Clinical Staff

C.auris Epidemiology, CDC Mycotic Diseases Branch, SHEA Webinar 2023

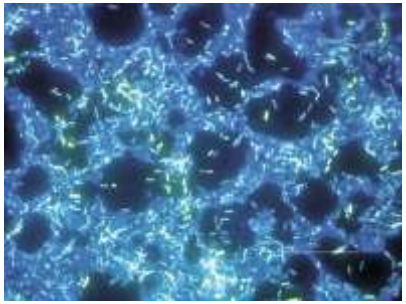
Cleaning and Disinfection



Most CA strains have shown the ability to form biofilms:

Biofilms develop when microorganisms adhere to a surface embedded in an extracellular polymeric substance (EPS) matrix. The matrix contains polysaccharides, proteins, lipids, enzymes, extracellular DNA and water.

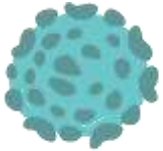
Biofilms prolong the survival of microorganisms and renders them tolerant to normal hospital cleaning and disinfection procedures.



Biofilms are traditionally associated with wet or damp surfaces (such as drains) but they can also form on inanimate dry surfaces.

*Currently there is no standard method for testing efficacy of detergents and disinfectants against biofilm formed on dry surfaces.

Donlon 2002
Almatroudi 2015



Cleaning and Disinfection

Biofilms can develop on or within indwelling medical devices such as:

- central venous catheters and needleless connectors
- endotracheal tubes
- intrauterine devices
- mechanical heart valves and pacemakers
- dialysis catheters
- prosthetic joints
- urinary catheters

Compared to other Candida species, CA can persist in a viable form on dried or moist surfaces for several weeks longer than other Candida species

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04

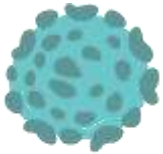
What Can We Learn From Recent Outbreaks?

CA Cluster in Paediatric Patients in Acute Care Hospital in Nevada

ACH had 31 adult cases and then identified 3 pediatric cases between December 2021 and April 2022

Pediatric cases:
- Under 6 months
- Born at ACH
- Severely ill and had invasive BSIs
- Had overlapping stays in the unit in neighboring rooms

CDC review identified:
- Cleaning and disinfection (C&D) policy of “who uses it cleans it” but staff could not state this was the expectation
- EVS staff not always moving from clean to dirty, potential contamination of the EVS cart and misuse of PPE
- Echocardiogram (which was wheeled between patient rooms) performed on all 3 pediatric cases and 66.7% of adult cases BEFORE testing positive



CDC Top Healthcare Associated Infection Responses of 2021 and 2022 (APIC 2023)

CDC Recommendations

- Ensure use of a disinfectant with claims against CA
- Assign clear C&D responsibility
- Train staff on how to perform adequate C&D
- Implement C&D audit and feedback system
- Improve hand hygiene compliance
- Refresher training on correct PPE use
- Education on best practices for C&D workflow
- Ensure all Candida isolates are speciated to identify CA
- Point prevalence surveys on all units with suspected transmission
- Targeted admission screening

CDC Top Healthcare Associated Infection Responses of 2021 and 2022 (APIC 2023)

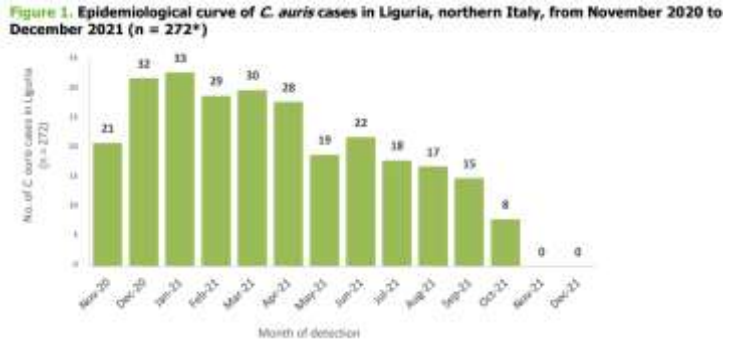
CA Outbreak in Northern Italy 2019-2021

First CA case in ACH was identified in July 2019 and sporadic cases continued to occur with a total of 277 across 8 healthcare facilities as of this report

CA was detected in a Covid-19 ICU in February 2020 and cases continued to increase to October 2021

4 healthcare facilities received patients with CA from this ACH

Risk of spread within Italy was deemed to be “HIGH”



European Centre for Disease Prevention and Control
Rapid Risk Assessment February 2022

ECDC Recommendations

Good standard infection prevention and control including environmental C&D, adequate C&D of reusable medical equipment, adequate microbiology laboratory capacity, sufficient capacity for isolation of patients in healthcare facilities

In addition, early, robust action when a case is identified:

- Prompt communication to IP and clinical team
- Detailed investigation of all cases- case review, contact tracing, consider point prevalence based on risk assessment
- Contact precautions and flagging of patients in case of readmission
- Single use equipment if possible or dedicated equipment for length of stay
- Use of a disinfectant effective against CA
- Raising awareness by providing education to all healthcare personnel
- Regular active surveillance cultures on wards

CA Outbreak in a Covid-19 Specialty Care Unit- Florida July-August 2020

Hospital's Covid-19 unit consisted of 5 wings on 4 floors

In July 2020, the Florida Department of Health reported 4 Covid-19 positive patients with CA- 3 with bloodstream infections and 1 with urinary tract infection

Amongst 67 patients screened during point prevalence surveys, 35 (52%) were CA positive and 6 (17%) subsequently had positive clinical samples

Joint investigation by Florida Department of Health and CDC revealed:

- Staff wearing multiple layers of PPE- First layer worn at all times (extended use), second layer donned on entry to patient rooms
- Clean equipment handled using inner layer of PPE including gloves which may be contaminated
- Multiple opportunities for contamination of the inner layer of PPE during doffing and through direct contact with the patient environment
- Shared patient equipment not always disinfected between uses
- Missed opportunities for hand hygiene

CDC MMWR January 2021

Florida Department of Health and CDC Recommendations

Multiple layers of PPE is not recommended. Use one layer of PPE at a time for the care of Covid-19 patients

Shared equipment must be appropriately cleaned and disinfected between patients

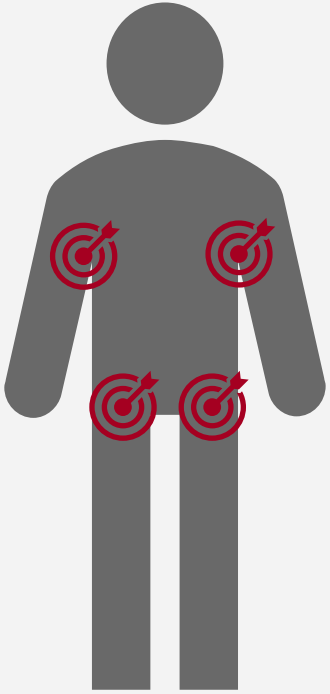
Clean patient equipment should not be handled wearing potentially contaminated PPE

Implement strategies to increase adherence to appropriate hand hygiene

CDC MMWR January 2021

Positive Correlation between *Candida auris* Skin Colonization Burden and Environmental Contamination in Ventilator-Capable Skilled Nursing Facility (vSNF) in Chicago, Illinois (Sexton et al 2021)

- 70-bed facility in Chicago Illinois
  - First CA case was identified by point prevalence in March 2017
  - **In 18 months (Sept 2018), CA colonization climbed to 71%!**
- Study sampled bilateral axillary/inguinal swabs on all residents

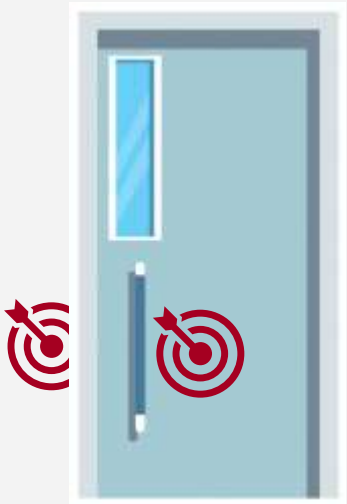


Study Findings vSNF Chicago:
Candida auris Positive Environmental Cultures

Bedrails

Left **81%**

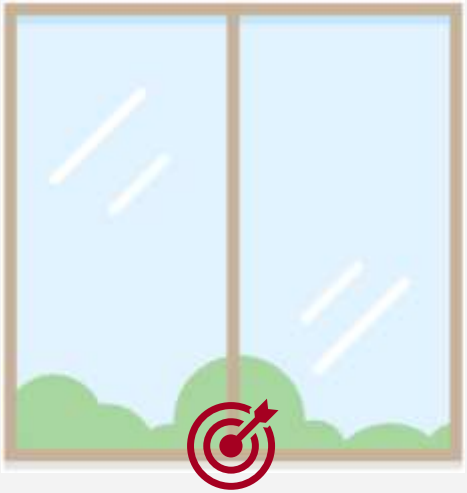
Right **78%**



Door handles

Inner **58%**

Outer **25%**



Windowsills

75%

Sexton 2021

Resident & Environmental CA Heatmap!

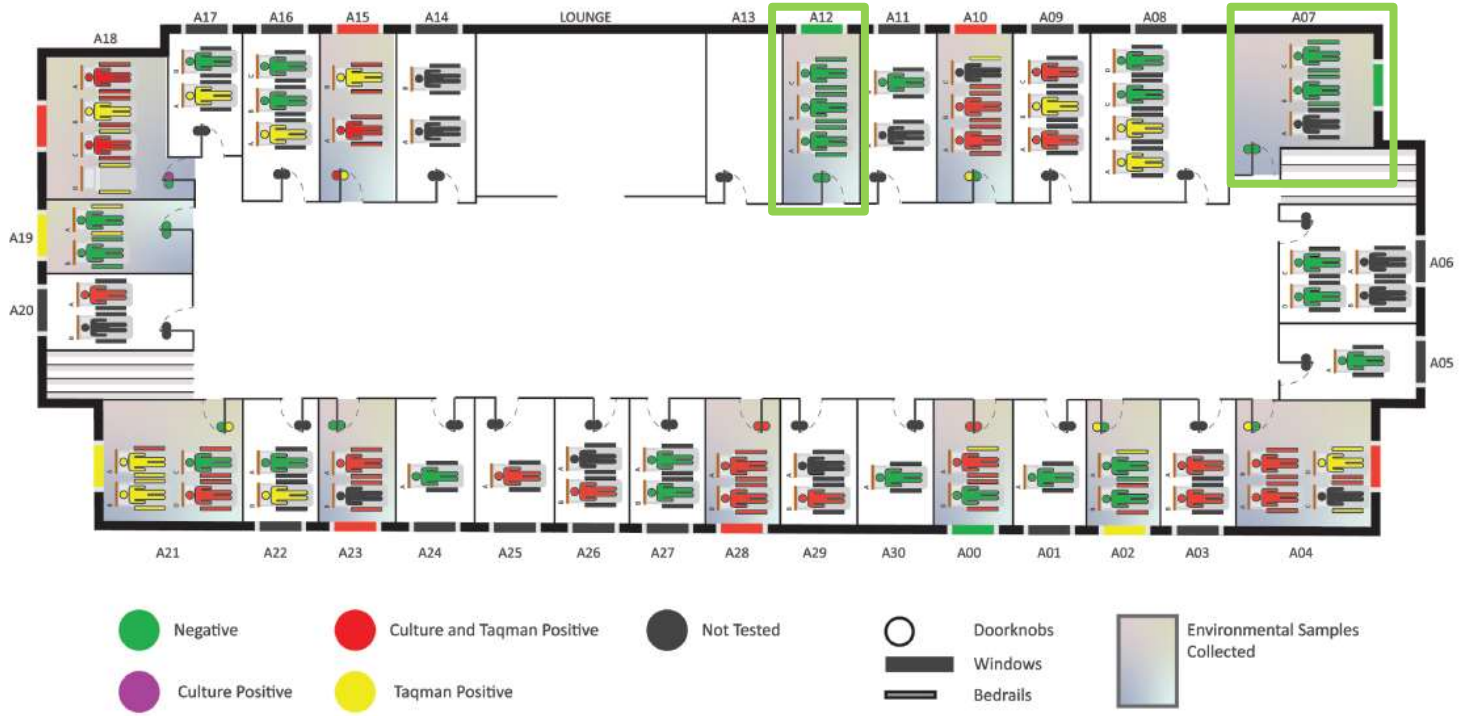


Figure 1. Facility map with culture-based and qPCR results for residents and associated environmental surfaces. The specific organization of beds within a room may differ from the image.

Sexton 2021

Study Findings vSNF Chicago

Colonized residents can have **high CA burden on their skin**, which was positively related with **contamination** of their surrounding healthcare **environment**.

3 patients who screened negative had bedrails that tested positive:

- 1 patient was previously positive for CA
- The other 2 patients were in rooms which were previously occupied by a CA positive patient 1-2 months before the study

These findings underscore the importance of:

- Hand hygiene
- Transmission-based precautions
- **Frequent environmental disinfection** with **EPA List P** disinfectants

Sexton 2021

05

Summary of Outbreak Recommendations

Summary of Outbreak Recommendations

Refer to CDC Infection Prevention and Control for *Candida auris*
https://www.cdc.gov/fungal/candida-auris/c-auris-infection-control.html

HEALTHCARE ENVIRONMENT:

- Assign clear C&D responsibility
- Train staff on how to effectively perform C&D including best practices for workflow- who cleans what and how?
- Implement C&D monitoring system (ATP, fluorescent marking, direct observation) with timely feedback
- Use a disinfectant effective against CA (List P)

PATIENT MANAGEMENT

- Single use equipment if possible or dedicated equipment for length of stay
- Manage patient on Contact precautions and flag chart in case of readmission

Summary of Outbreak Recommendations

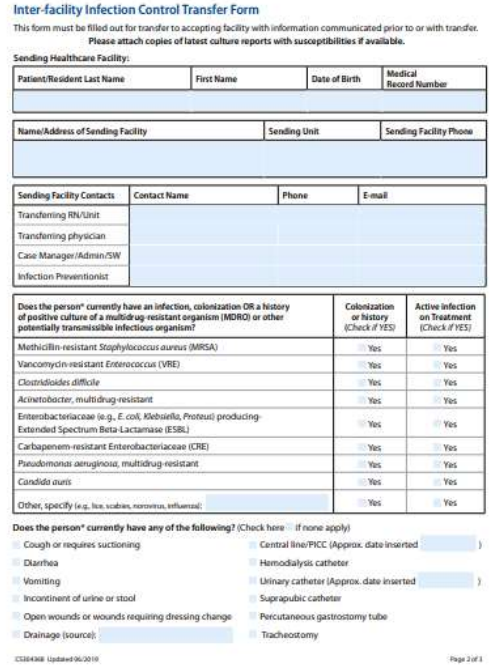
STAFF

- Raise awareness by providing education to all healthcare personnel
- Prompt communication of case to IP and clinical team
- Implement strategies to increase adherence to appropriate hand hygiene, PPE use and C&D of multi-use equipment

Communication of Interfacility Transfers

Healthcare facilities should be informed if an incoming patient has ever:

1. Tested positive for CA, with or without symptoms.
2. Was exposed to another patient with C. auris.
3. Was in a facility where an outbreak was occurring



Inter-facility Infection Control Transfer Form

This form must be filled out for transfer to accepting facility with information communicated prior to or with transfer.
Please attach copies of latest culture reports with susceptibilities if available.

Sending Healthcare Facility:

Patient/Resident Last Name	First Name	Date of Birth	Medical Record Number

Name/Address of Sending Facility	Sending Unit	Sending Facility Phone

Sending Facility Contacts	Contact Name	Phone	E-mail
Transferring RN/Unit			
Transferring physician			
Case Manager/Admin/SW			
Infection Preventionist			

Does the person* currently have an infection, colonization OR a history of positive culture of a multidrug-resistant organism (MDRO) or other potentially transmissible infectious organism?	Colonization or history (Check if YES)	Active infection or Treatment (Check if YES)
Methicillin-resistant *Staphylococcus aureus* (MRSA)	Yes	Yes
Vancomycin-resistant *Enterococcus* (VRE)	Yes	Yes
Clostridioides difficile	Yes	Yes
Acinetobacter, multidrug-resistant	Yes	Yes
Enterobacteriaceae (e.g., *E. coli*, *Klebsiella*, *Proteus*) producing Extended Spectrum Beta-Lactamase (ESBL)	Yes	Yes
Carbapenem-resistant Enterobacteriaceae (CRE)	Yes	Yes
Pseudomonas aeruginosa, multidrug-resistant	Yes	Yes
Candida auris	Yes	Yes
Other, specify (e.g., lice, scabies, norovirus, influenza):	Yes	Yes

Does the person* currently have any of the following? (Check here if none apply)

Cough or requires suctioning	Central line/PICC (Approx. date inserted)
Diarrhea	Hemodialysis catheter
Vomiting	Urinary catheter (Approx. date inserted)
Incontinent of urine or stool	Suprapubic catheter
Open wounds or wounds requiring dressing change	Percutaneous gastrostomy tube
Drainage (source):	Tracheostomy

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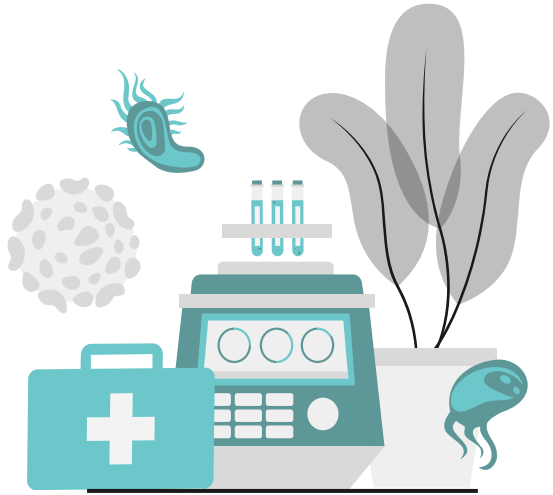
https://www.cdc.gov/hai/pdfs/toolkits/Interfacility-IC-Transfer-Form-508.pdf

Summary of Recommendations

SURVEILLANCE AND TESTING:

- Ensure all Candida isolates are speciated to identify CA.
- Perform point prevalence surveys on all units with suspected transmission.
- Consider targeted admission screening based on local epidemiology.
- Take early, robust action when a case is identified.
- Detailed investigation of all cases- case review, contact tracing, consider point prevalence based on risk assessment



In Summary

The rise and geographic spread of CA is concerning because of the:

- Extent of resistance to antifungal treatments
- Ability to withstand common healthcare disinfectants
- High mortality rates of invasive infections
- Ability to cause prolonged outbreaks in health care settings
- Difficulty to identify in an accurate and timely manner in the laboratory

In Summary

What's needed:

- Surveillance & **early detection** of cases to mitigate transmission (**increased screening!**)
- Increased **laboratory capacity** for identification, cluster analysis, & antifungal susceptibility testing
- **New antifungal** agents
- Improved **disinfectants** with achievable contact times on **EPA's List P,** with **increased cleaning & disinfection during outbreaks**
- Strict adherence to infection prevention & control policies and procedures

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Thanks!

Questions?

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Public Health Ontario Focus on Candida Auris, June 2023
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