Candida auris: The Fungus Among Us

Healthcare Safety Unit

Office of the Chief State Epidemiology Section

Texas Department of State Health Services

July 16, 2024

Objectives

- Review Candida auris (C. auris) background.
- Discuss C. auris data trends in Texas from 2021 2024.
- Learn how to conduct a public health response to *C. auris* in a healthcare setting.
- Summarize an epidemiological response to *C. auris* in a correctional system.

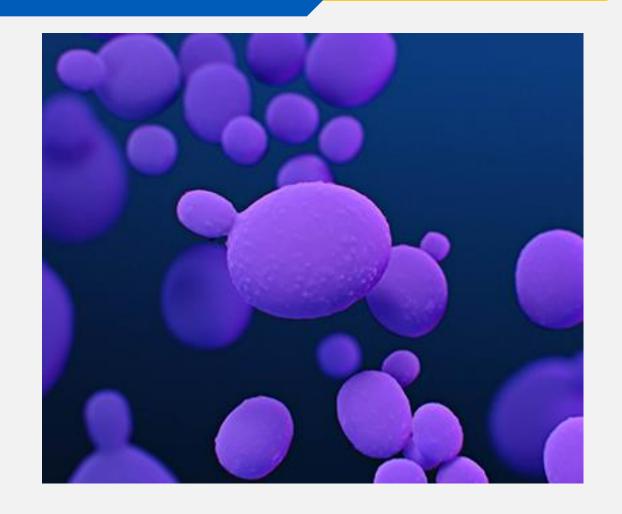
C. auris Background

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Office of the Chief State Epidemiologist
Texas Department of State Health Services



What is *C. auris*?

- *C. auris* is an emerging and often multidrug-resistant fungus.
- First discovered in 2009.
- Made nationally notifiable in 2018.
- Added to Texas Notifiable Conditions List in 2021.



Available at: https://www.cdc.gov/fungal/candida-auris/candida-auris/prevention/?CDC AAref Val=https://www.cdc.gov/fungal/candida-auris/candida-auris-qanda.html, accessed on June 6, 2024.

Colonization vs. Infection

Colonization

- Organism found in or on the body, but not causing disease symptoms.
- Frequently colonizes the axilla and groin.

Infection

Organism causing clinical disease symptoms.

Why is *C. auris* a problem?

- Difficult to identify
 - Often misidentified as other types of fungi unless specialized laboratory technology used.
 - Misidentification might lead to patient getting wrong treatment.
- Easily spread in hospitals and nursing homes
 - Can live on surfaces for several weeks.
 - Causes outbreaks in healthcare facilities and can spread through contact with affected patients and contaminated surfaces or equipment.

Why is *C. auris* a problem?

- Resistant to medicines
 - Antifungal medicines commonly used to treat Candida infections often do not work for C. auris.
 - Some *C. auris* infections resistant to all three types of antifungal medicines.
- Causes dangerous infections
 - Can cause bloodstream infections and death, particularly hospital and nursing home patients with serious medical problems.

C. auris Morbidity and Mortality

5-10% of colonized patients develop bloodstream infections.



Mortality of invasive infections is ~40% within the first 30 days.

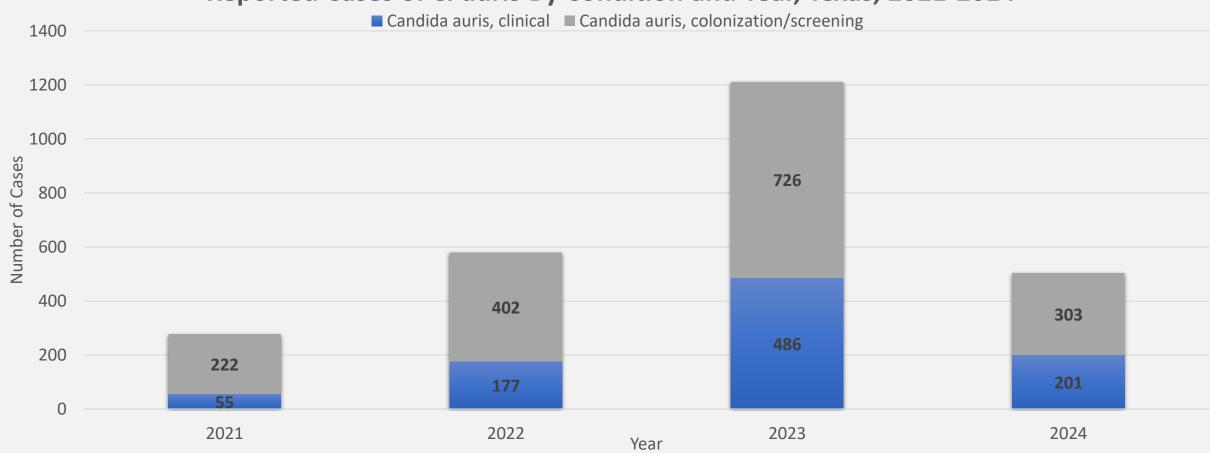
C. auris Trends in Texas (2021-2024)

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C. *auris* Trends in Texas (2021-2024)

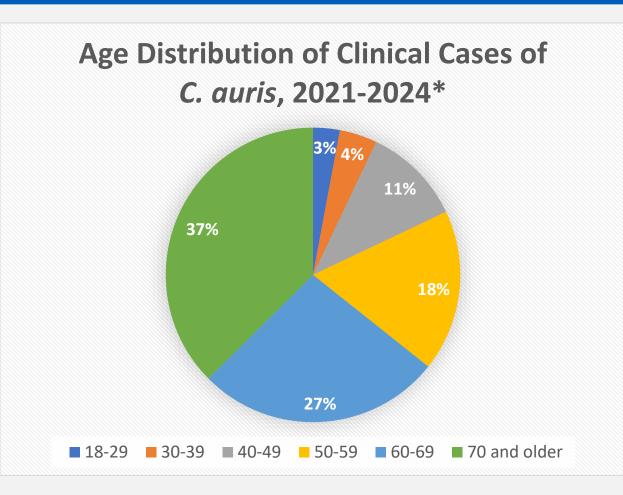


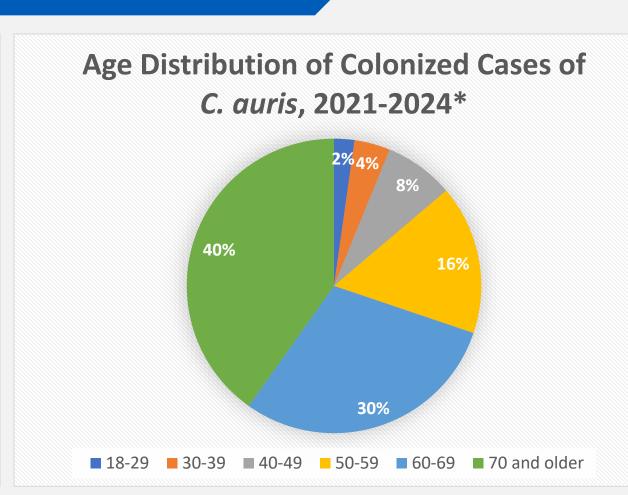


Source: Texas National Electronic Disease Surveillance System Based System, accessed 05/17/2024.

^{*2024} data includes cases reported through 04/30/2024. 2023 and 2024 data is preliminary and subject to change.

C. *auris* Trends in Texas (2021-2024)





Source: Texas National Electronic Disease Surveillance System Based System, accessed 05/17/2024.

^{*2024} data includes cases reported through 04/30/2024. 2023 and 2024 data is preliminary and subject to change.

C. *auris* Trends in Texas (2021-2024*)

Sex	Clinical	Colonization/screening	Grand Total	
Female	388	702	1090	
Male	531	949	1480	
Unknown	0	2	2	
Grand Total	919	1653	2572	

Source: Texas National Electronic Disease Surveillance System Based System, accessed 05/17/2024.

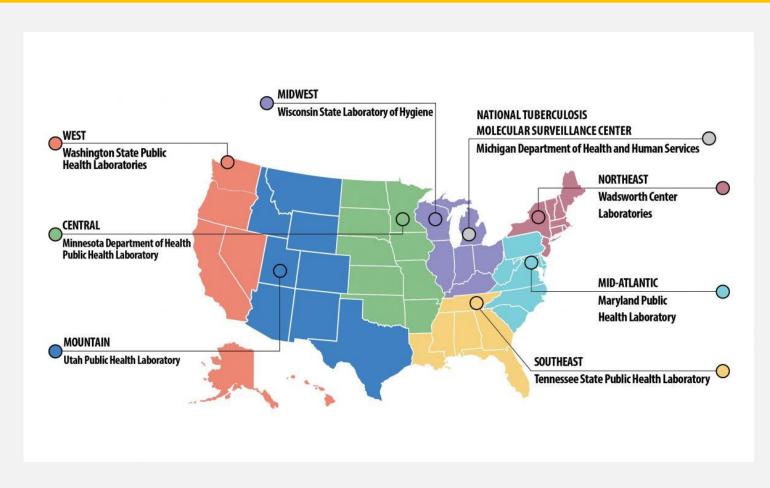
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C. auris Public Health Response

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Antimicrobial Resistance Laboratory Network (ARLN) Laboratories and Coverage Areas





Available at: https://www.cdc.gov/antimicrobial-resistance-laboratory-networks/php/about/domestic.html, accessed June 4, 2024.

ARLN: Laboratories Roles

Clinical/ reference labs

Sends isolates of targeted AR organisms to Texas DSHS lab.

DSHS lab

Testing to identify novel and targeted resistance patterns.

Isolates sent to Utah lab for further testing when needed.

Utah Regional AR lab

Further resistance testing and sends unusual isolates to CDC lab.

CDC lab

Further testing, including confirmation of unusual resistance patterns.



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Investigation Guidance

- <u>Texas Antimicrobial Resistance Laboratory Network</u>
 <u>Response Plan</u>
 - Follows <u>CDC guidance on responding to novel or targeted</u> <u>multidrug-resistant organisms</u>.
 - Based on epidemiology of drug-resistant organisms in Texas.
- DSHS Emerging and Acute Infectious Disease Guidelines –
 C. auris chapter



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C. auris Containment

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C. auris Prevention and Control Measures

- Hand hygiene
- Setting-specific Transmission-Based Precautions.
- Environmental disinfection with a product effective against *C. auris*.
- Communication when a patient is transferred.
- Colonization screening for newly identified cases' contacts.



Hand Hygiene

- Alcohol-based hand sanitizer is effective against C. auris.
 - Alcohol-based hand sanitizer is the preferred hand hygiene method when hands are not visibly soiled.
 - Use an alcohol-based hand sanitizer that contains at least 60% alcohol.
- When using alcohol-based hand sanitizer:
 - Put product on hands and rub hands together.
 - Cover all surfaces until hands feel dry.
 - This should take around 20 seconds.
- Glove use is not a substitute for hand hygiene!



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Hand Hygiene



Available at: https://www.foodnavigator.com/Article/2013/08/21/Program-helps-processors-maximize-hand-hygiene accessed April 25, 2024.

Transmission-Based Precautions

- Patients colonized or infected with *C. auris* should be on transmission-based precautions for the duration of their stay.
 - Contact Precautions
 - Enhanced Barrier Precautions
- There is currently no data to support ending transmission-based precautions for those colonized or infected with *C. auris*.



Different Types of Precautions

- Standard Precautions
 - Based on the "anticipated exposure" to blood, body fluids, secretions, or excretions.
- Contact Precautions
 - Require gown and gloves on every entry into a resident's room, regardless of the level of care provided.
 - Targeted gown and glove use during high contact resident care activities, designed to reduce transmission of **Multi-Drug Resistant Organisms (MDROs)**.



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Different Types of Precautions, continued

- Enhanced Barrier Precautions
 - Only require gown and gloves for high-contact care activities (unless otherwise indicated as part of Standard Precautions).
 - Enhanced Barrier Precautions may be applied (when Contact Precautions do not otherwise apply) to residents with:
 - Wounds or indwelling medical devices, regardless of MDRO colonization status; or
 - MDRO infection or colonization.



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Examples of Appropriate Signage







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<u>Available at: https://www.cdc.gov/infection-control/media/pdfs/contact-precautions-sign-P.pdf</u> and https://www.cdc.gov/infection-control/media/pdfs/contact-precautions-sign-P.pdf and https://www.cdc.gov/long-term-care-facilities/media/pdfs/enhanced-barrier-precautions-sign-P.pdf, accessed June 06, 2024.

Clean and Disinfect Properly

- Select an appropriate product for C. auris from EPA List P.
 - EPA List P: Antimicrobial Products Registered with EPA for Claims Against *Candida auris*.
- Clean equipment and surfaces first to remove visible soil, like dirt or blood.
- Disinfect equipment and surfaces after cleaning.
- Ensure staff using disinfects are aware of correct contact time.
 - Contact time the amount of time a disinfectant needs to sit on a surface, without being wiped away or disturbed, to effectively kill germs.



EPA Registered Disinfectants

- EPA's Registered Antimicrobial Products Effective as Sterilizers [List A]
- EPA's Registered Antimicrobial Produ

 [List B]
- EPA's Registered Antimicrobial Prod
 G]
- EPA's Registered Antimicrobial Production
 aureus (MRSA) and/or Vancomycin R

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About EPA \

Pesticide Registration

EPA's Registered Antimicrobial Products Effective Against Candida auris [List P]

On this page:

- Disinfectant Products for Claims Against Candida auri
- Products on EPA's Registered Antimicrobial Products Effective Against Candida auris [List P
- EPA's Registered Antimicrobial Products for Medical Waste Treatment [List J]
- EPA's Registered Antimicrobial Products Effective Against Clostridium difficile Spores [List K]
- EPA's Registered Antimicrobial Products Effective Against Ebola Virus [List L]
- EPA's Registered Antimicrobial Products Effective Against Avian Influenza [List M]
- Disinfectants for Use Against SARS-CoV-2 [List N]
- Disinfectants for Use Against Rabbit Hemorrhagic Disease Virus (RHDV2) [List O]
- EPA's Registered Antimicrobial Products Effective Against Candida auris [List P]
- <u>Disinfectants for Emerging Viral Pathogens (EVPs) [List Q]</u>
- <u>EPA's Registered Antimicrobial Products Effective Against Bloodborne Pathogens (HIV, Hepatitis B and Hepatitis C) [List S]</u>



Texas Department of State Health Services Available at https://www.epa.gov/pesticide-registration/epas-registered-antimicrobial-products-effective-against-candida-auris-list, accessed June 6, 2024.

How to Use List P?





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Reading a Disinfectant Label

- EPA Registration Number
 - Find the registration number on the product label.
 - Look for "EPA Reg. No." followed by two or three sets of numbers.
- Directions for Use
 - What organisms is it effective against?
- Contact Time
 - Products have different contact times for specific organisms.

Available at: https://www.cdc.gov/hai/pdfs/howtoreadalabel-infographic-508.pdf, accessed June 6, 2024.

EPA Registration Number:

U.S. laws require that all disinfectants be registered with EPA.

Directions for Use (Instructions for Use):

Where should the disinfectant be used?

What germs does the disinfectant kill?

What types of surfaces can the disinfectant be used on?

How do I properly use the disinfectant?

Contact Time:

How long does the surface have to stay wet with the disinfectant to kill germs?

Alkyl (60% C14, 30% C16, 5% C12, 5% C18) Dimenthyl Benzyl Ammonium Chloride

OTHER INGREDIENTS:

TOTAL:

EPA REG NO. 55555-55-55555

CAUTION •

Directions for Use

INSTRUCTIONS FOR USE:

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

For Disinfection of Healthcare Organisms:

 Staphylococcus aureus, Pseudomonas aeruginosa.

To Disinfect Hard, Nonporous Surfaces:

Pre-wash surface.

Mop or wipe with disinfectant solution.

Allow solution to stay wet on surface for at least 10 minutes.

Rinse well and air dry.



EXP MM-DD-YYYY

55555 55555 5

PRECAUTIONA Hazardous to h

Hazardous to h animals. Wear (protection.

CAUSES MOD IRRITATION. A skin or clothing soap and water contact with fo

FIRST AID: IF I and rinse slowl for 15-20 minu lenses, if prese 5 minutes, ther IF ON SKIN OR contaminated c immediately wi 15-20 minutes

POISON CONTI Control Center doctor for treat

STORAGE AND

product in a co direct sunlight use keep cente prevent moistu container. Do n container.

Communication of Infection and Isolation Status



Texas Department of State Health Services Available at:

https://www.dshs.texas.gov/sites/default/files/ID CU/health/Healthcare-Safety/Interfacility-Transfer-Form-final-Revised-AM-111221.pdf, accessed June 6, 2024.

INTER-FACILITY INFECTION PREVENTION TRANSFER FORM

This form must be completed for transfer of a patient to the receiving facility. Information should be communicated prior to and during the transfer.

Affix patient label here or complete patient nformation below.							
Patient Name:							
DOB:	MRN:						

and during the transfer.			DOB: MRN:							
TRANSFER INFORMATION										
Transfer Date:		Sending Facility Name,	, City	//State:						
Sending Facility Point of Contact and Phone Number (for follow up questions):										
Receiving Facility Name, City/State:										
receiving Facility Hallie, City/State.										
ISOLATION STATUS										
Currently in Isolation?										
☐ Contact		Contact plus Hand H with Soap/Water	lygie	ene 🗌	Droplet		Airborne			
SIGNIFICANT INFECTIO	US	DISEASE HISTORY	1							
Does the patient have a history of any known MDRO or infectious disease? Yes No If Yes, check box(es) below and provide supporting lab reports and antimicrobial susceptibility results, if available.										
Acinetobacter, multidrug-resistant (MDR-A)		Candida auris			m-resistant eriaceae (CRE)		Carbapenem-resistant Pseudomonas aeruginosa (CRPA)			
Clostridoides difficile (C. diff.)		Extended Spectrum β-lactamase (ESBL)		Influenza d illness (ILI	or Influenza-like)		Methicillin-resistant Staphylococcus aureus (MRSA)			
Mycobacterium tuberculosis (TB)		Vancomycin-resistant Enterococcus (VRE)		Other: (ex	ample: pertussis)		(MOA)			
SIGNS AND SYMPTOMS										
Check all that currently a	pply		_			_				
☐ Incontinent of urine		Draining wounds		Vomiting			Rash (e.g., vesicular)			
Acute diarrhea or incontinent of stool		Cough/uncontrolled respiratory secretions		Other unco fluids/drain	ontained body nage		Other (specify):			
OTHER RISK FACTORS										
Does the patient currently h	ave	any of the following dev	ices	? 🗌 Yes (c	heck all that appl	y) [No			
☐ Central line/PICC		Hemodialysis Catheter		Urinary Ca	theter		Suprapubic catheter			
■ Nasogastric/PEG tube		Tracheostomy		Fecal man	agement system		Ventilator/Intubated			
Other (specify):										
Cultures pending? ☐ Yes, date collected: ☐ No										
ATTACH MEDICAL ADMINISTRATION RECORD (MAR)										
Additional Comments:										

C. auris Colonization Screening

- Performed to identify healthcare contacts who may be colonized with C. auris.
- Conducted by swabbing areas of the body that are commonly colonized.
- Always recommended for high-risk contacts (i.e., roommates).
- Screening can be expanded to other patients.





Available at: C. auris: How to Screen, accessed June 6, 2024.

Thank you!

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There's a Fungus Among Us

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Operations Manager-Infection Control & Healthcare Epidemiology University of Texas Medical Branch



Objectives

Summarize an epidemiological response to *C.auris* in a correctional system



Overview

- UTMB's *C.auris* screening program
- TDCJ-Hospital Galveston (HG)
- 2022 Outbreak
- 2023 Outbreak
- Current status
- Summary



UTMB-University of Texas Medical Branch

- 6 campuses (~1,000 beds)
 - Hospital Galveston (TDCJ)
 - Jennie Sealy
 - John Sealy
 - Clear Lake
 - League City
 - Angleton
- ~90 offsite clinics
- TDCJ-HG
 - 164 inpatient beds
 - 85 infirmary beds



UTMB's Candida auris Screening, Isolation and Decontamination Protocol in 2022

- First patient, November 2021 from LTAC
- February 2022, all patients from long-term facilities (SNF, assisted living, nursing homes, long term acute care, rehab center) are tested and placed in isolation precautions (XDR) until cleared by Infection Control.
- Utilized EMR system
 - Admission screening
 - Best Practice Alerts (BPAs)
- Testing
 - Culture-based testing
 - 48-72 hour results (in-house)
- Environmental services(EVS) -daily cleanings with bleach-based products. Upon discharge, bleach cleaning and IC performs environmental sampling
- Education and Fact Flashes for all staff

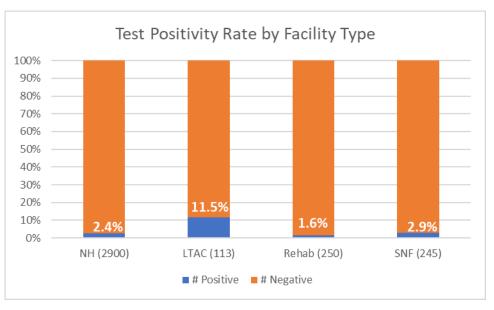


Identifying High-Risk Patients

Who should you screen?

- Long-term acute care, nursing facilities, rehab centers, and facilities with known patients
- Contact tracing for exposed patients
- No prisoners included

UTMB experience



Excludes prison population



Everything happens on a holiday weekend or Friday afternoon

- July 4th on-call IP receives notification of a patient with Candida auris in the blood
 - Patient was in our prison hospital
 - Shared spaces
 - 2-3 patients per room
 - Holiday so limited staffing all around





TDCJ-Hospital Galveston -July 2022

Positive Blood Culture

- First patient identified at HG-July 2022
- Contact tracing, patient and environmental screening
- Education and emphasis on hand hygiene and cleanliness

Contact Tracing and Hospital Wide Testing

- 9 unique patients identified (including initial patientblood)
- 8 surveillance only
- 5 from similar outside infirmaries

Inmates not high-risk patients, per CDC



Stakeholder Meeting

Representation

- Texas Department of State Health Services (DSHS)-Healthcare Safety Unit (HSU)
- UTMB Infection Control & Healthcare Epidemiology (ICHE)
- Hospital Galveston (HG) Leadership
- Correctional Managed Care (CMC)

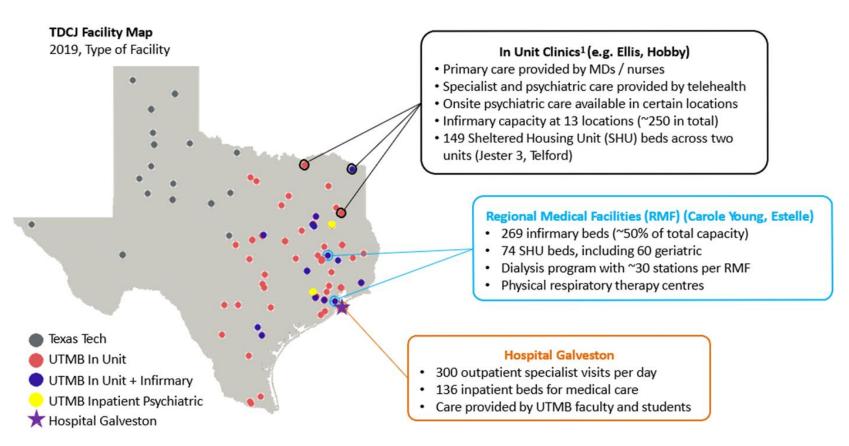


Correctional Managed Care (CMC)

- Contract originated September 1994
- Inmate Service Population: 108,069
- Healthcare Encounters: 11,674,248 annually
- There are 79 facilities within TDCJ
- Infirmaries: 16 infirmaries, 539 total infirmary beds within TDCJ
 - Estelle



UTMB Provides Care to ~80% of Texas Inmates Across ~98 Correctional Facilities, Including Inpatient Care at Hospital Galveston



TDCJ-Hospital Galveston -July 2022

Positive Blood Culture

- First patient identified at HG-July 2022
- Contact tracing, patient and environmental screening
- Education and emphasis on hand hygiene and cleanliness

Hospital Wide Testing

- 9 unique patients identified (including initial patient-blood)
- 8 surveillance only
- 5 from similar outside infirmaries

Testing Results

- Testing all patients from Estelle infirmary
- 344 patients tested (HG and outside unit)
- Culture to PCR testing



Collaboration

- DSHS assisted with case review and testing of Estelle patients
- Whole genome sequencing (WGS)
 - Clade III closely clustered
- Education with CMC unit
 - EPA approved cleaning
 - Hand hygiene
 - Isolation



UTMB Surveillance Program and HG in 2022

Plan

- CMC Admissions to HG from Estelle tested
- Cohort positive patients at HG
 - Implement transmission-based precautions
- Conduct contact tracing for positive and exposed patients
 - Test all patients on the same unit, including roommates
- Electronic medical record (EMR) flagging for positive patients



EVERYTHING WAS GREAT AND THE PLAN WAS WORKING AMAZINGLY



UNTIL IT DIDN'T ...



Gaps in Practice

- New HG ICU patient positive blood culture with *C.auris* identified April 23, 2023
- Patient was not part of the Estelle group
- Review Estelle admission testing
 - Not all patients were consistently captured



Immediate Actions Taken by ICHE and HG

- Implemented transmission-based precautions
- Conducted contact tracing of patients and environments
- Increased screening protocols
 - All HG screened (baseline)
 - All admissions to HG screened
- Co-horted positive and exposed incarcerated patients
- Enhanced environmental disinfection efforts
 - Blacklight cleaning checks
 - UV light disinfection
 - Environmental testing
- Meet with stakeholders



Stakeholder Meeting- May 2, 2023

Representation

- Texas Department of Criminal Justice (TDCJ)
- Texas Department of State Health Services (DSHS)
- UTMB Infection Control & Healthcare Epidemiology (ICHE)
- Hospital Galveston leadership
- Correctional Managed Care (CMC)



Topics of Discussion

- 4/23/23 Positive patient with *C.auris*
- 4/26/23-4/30/23
 - 258 total admits
 - 60 new admits
 - Tested 62 patients
 - 7 positives (11.2% positive)

Things to Consider

- No published guidance for how to manage C.auris in a prison setting
- Patients from various units
- More confirmed patients may be present outside of HG within the prison settings



Collaboration

- DSHS assisted with case review and testing of outside TDCJ infirmaries
 - Estelle
 - Jester 3
 - Carole Young
- 6/2023 Whole genome sequencing (WGS)
 - Clade III (20 isolates)
 - Clade I (4 isolates)
- As of 8/2023, 900 patients tested and14 outside positives were identified
- As of 10/2023 HG, 3,000 tests performed and 45 unique patients identified



Standard Operating Practice for HG and CMC

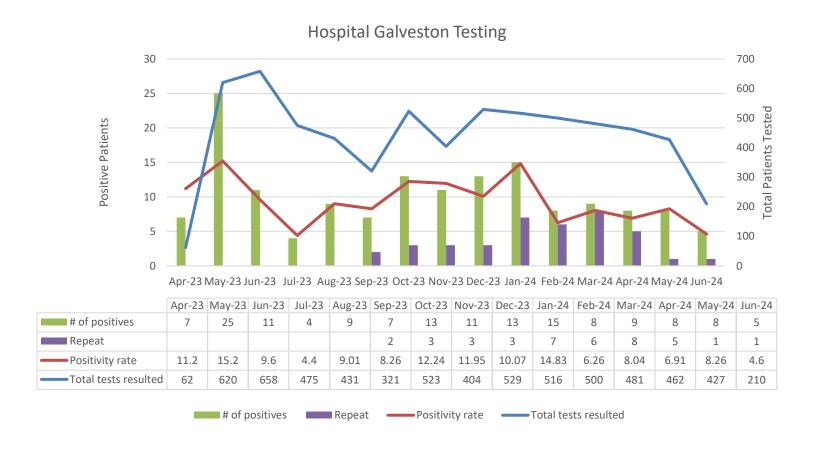
Worked with CMC

- Create a policy on C.auris for CMC
- Enhanced cleaning
- Enhanced testing
- Stakeholder communication

Meeting with CDC to discuss gaps in guidance for prison settings



C. auris Prison Population Specific Testing





Total Volume as of 6/21/24

- 11 positive Candida auris patients admitted to Hospital Galveston
- 1 exposed to positive patients
- 89 patients identified through surveillance Candida auris screening
 - Last positive identified through admission screening 6/17/24
 - Last transmission possibly 6/11/24
 - 5 out of 89 have clinical sites positives
 - 18 out of 89 patients are deceased, unrelated to Candida auris



Mitigation Strategies

- ✓ Monthly meetings with stakeholders
 - **✓**TDCJ
 - **✓** DSHS
 - **✓** CDC
 - **✓UTMB ICHE**
 - **✓** CMC
- ✓ Unit screenings
- ✓ Monthly HG infirmary testing, weekly unit testing with confirmed patients
- √ Standard and Isolation Precautions
- √ Cleaning protocols



UTMB's Candida auris Screening, Isolation and Decontamination Protocol

- First patient, November 2021 from LTAC
- February 2022, all patients from long-term facilities (SNF, assisted living, nursing homes, long term acute care, rehab center) are tested and placed in isolation precautions (XDR) until cleared by Infection Control.
- Utilized EMR system
 - Admission screening
 - Best Practice Alerts (BPAs)
- Testing
 - Previously culture-based testing (December 2021-December 2022)
 - PCR testing (December 2022)
- TDCJ-HG cohort patients in rooms
- Environmental services(EVS) -daily cleanings with bleach-based products. Upon discharge, bleach cleaning and **UV light disinfection.**
- IC performs environmental sampling



Key Takeaways

- Candida auris is a serious threat
- More facilities need to conduct active surveillance
- Break the chain of infection
- Identifying your patients
- Screening
- Communication between facilities
- Build relationships with other stakeholders
- TDCJ
- CMC
- DSHS
- Infection Prevention



How long do we isolate inmates outside of acute care setting?

Consequences of isolation can be very dire:

- Social isolation, stigma
- Reduced interaction with medical personnel leads to reduced quality of care
- High costs- reduced space utilization, increased use of PPE supplies
- Isolated patient has no direct benefit to the colonized inmate as there is no effective method of decontamination. The main benefits is to others who are protected from exposure



Factors Contributing to Success

- Collaboration between CMC, DSHS, ICHE and HG, TDCJ
- Creating a plan, forming a team, regular meetings
- Policy creation for CMC regarding C.auris management
- Weekly surveillance testing in high-risk units with C auris patients, Monthly testing in infirmary units
- EMR automated testing order at admission
- Enhanced environmental cleaning

Publication:

A cluster investigation of Candida auris among hospitalized incarcerated patients.

Published in Antimicrobial Stewardship and Healthcare Epidemiology



References

- Centers for Disease Control and Prevention. (2023, March 20). Increasing Threat of Spread of Antimicrobial-resistant Fungus in Healthcare Facilities. https://www.cdc.gov/media/releases/2023/p0320-cauris.html
- McDougal, A. N., DeMaet, M. A., Garcia, B., York, T., Iverson, T., Ojo, O., & Patel, J. (2023). A cluster investigation of Candida auris among hospitalized incarcerated patients. Antimicrobial stewardship & healthcare epidemiology: ASHE, 3(1), e244. https://doi.org/10.1017/ash.2023.520

THANK YOU to involved in the cluster investigations and those who continue to support the work that we do to prevent the spread of *Candida auris*.

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