Utah Department of Health & Human Services

Candida auris

Disease plan

Quick links

Critical clinician information	2
Why is Candida auris important to public health?	4
Disease and epidemiology	4
Public health control measures	12
Case investigation	17
References	25
Version control	28
UT-NEDSS (EpiTrax) minimum/required fields by tab	29
Candida auris infection rules for entering laboratory test results	30
Appendices	32

Last updated: April 11, 2024, by Charisse Schenk, Chrissy Radloff, Devin Beard, Ashley Young, Angela Weil, April Clements

Questions about this disease plan?

Contact the Utah Department of Health and Human Services Office of Communicable Diseases: 801-538-6191.

Critical clinician information

Clinical evidence

Signs/symptoms

- *Candida auris* (*C. auris*) infections can present as septicemia, pneumonia, a urinary tract infection, and wounds/abscesses.
- *C. auris* can also be present as asymptomatic colonization.

Period of communicability

- *Candida auris* is communicable indefinitely from patients who are infected or colonized (colonization is when *C. auris* is present, but the patient does not have symptoms or signs of illness).

Incubation period

- The incubation period is not well defined.

Mode of transmission

- *C. auris* is transmitted through direct contact with colonized or infected patients or contaminated surfaces.
- *C. auris* can survive on equipment and environmental surfaces for several weeks
- *C. auris* spread can be prevented by strict adherence to hand hygiene and personal protective equipment (PPE) protocols in healthcare settings.

Laboratory testing

Type of lab test/timing of specimen collection

- *C. auris* can be misidentified as other closely related yeast species such as *Candida haemulonii (C. haemulonii)*, and requires specialty non-routine laboratory methods.
- Colonization screening is available (using PCR methodology) for confirmed cases and potential outbreaks.
- Antifungal susceptibility testing (AFST) should be performed on all clinical *C. auris* isolates.
- Whole genome sequencing (WGS) can be used to study connections between isolates and to identify potential outbreaks.

Type of specimens

- Yeast isolates for rule out testing include: sputum, urine, abscesses, wounds (pressure sores), blood sources.
- Composite axilla-groin swabs are used for colonization screening.

Treatment recommendations

Type of treatment

- Treatment is recommended only for clinical infection or invasive *C. auris* disease.
    - Treatment is not recommended for colonized patients.
    - The Clinical and Laboratory Standards Institute (CLSI) does not have breakpoints for *C. auris*; however, tentative breakpoints are available as a treatment guideline.
- Antifungal drugs called echinocandins are used to treat *C. auris* infections, although high doses of multiple agents may be required to treat invasive infection since some isolates are resistant to multiple classes of antifungals, including echinocandins.

Time period to treat

- Not defined

Prophylaxis

- None

Contact management

Isolation of case

- Contact precautions
- Enhanced barrier precautions, when warranted

Quarantine of contacts

- None

Infection control procedures

- Contact precautions or enhanced barrier precautions are recommended for patients/residents who are infected OR who are colonized with *C. auris*
- Use Contact precautions for all patients with known *C. auris*, whether infected or colonized, in **acute care hospitals and long-term acute care hospitals**.
- Residents in **nursing homes** (e.g., skilled nursing facilities) with known *C. auris* infection or colonization should be placed on:
    - Contact precautions if they have acute diarrhea, draining wounds, or sites of secretions or excretions that are not able to be contained or covered or when directed by public health authorities.
    - Enhanced barrier precautions for residents with known *C. auris* infection or colonization when contact precautions do not apply.

---

*A full color fact sheet is available from the CDC website.

Why is *Candida auris* important to public health?

Candida auris (*C. auris*) is an emerging multi-drug resistant fungal pathogen, found commonly in healthcare settings abroad.[1] *C. auris* was first identified in 2009 from an inner-ear culture in Japan, and has since spread globally.[2] This fungal infection is a concern not only because of treatment complexities (because of its multi-drug resistance), but also the fact that it targets medically-vulnerable populations.[3,4]

Patients infected with *C. auris* are also likely to be colonized. Colonization can result even after successful treatment of the infection. Additionally, infections can occur in colonized patients, especially those with in-dwelling devices, central lines, and wounds.[2] In such cases, devices can provide a portal for invasive infection with high mortality rates.

This pathogen is highly transmissible in healthcare settings and has demonstrated the ability to overrun hospitals and long-term care settings.[4] Further complications come from the pathogen's ability to survive on environmental surfaces, and its resistance to typical disinfection procedures.[5]

The first case of *C. auris* in the U.S. appeared in 2013, and was detected through a retrospective study.[6] *C. auris* is reportable under the Utah Communicable Disease Rule.[7] Because *C. auris* can be commonly misidentified as *Candida haemulonii (C. haemulonii),*[8] this organism has also been included in the Utah Reportable Disease Rule. For the most current case numbers by state of *C. auris* in the U.S., refer to the Centers for Disease Control and Prevention's (CDC) tracking *Candida auris* website. Surveillance will provide better understanding about transmission, resistance patterns, and treatment response of this emerging pathogen.

Disease and epidemiology

Clinical description

C. auris has been found in bloodstream infections in healthcare settings and is often associated with high mortality rates. In addition to invasive infection, this emerging pathogen may also cause respiratory and urinary tract infections. It can colonize the skin where no detectable clinical infection is seen; often leading to invasive infection and the potential for spread to other patients.

Causative agent

C. auris is a yeast in the *Ascomycota* phylum. It forms elongated and ovoid cells that can be seen on a wet-mount. Currently, no hyphae or pseudohyphae growth has been seen. On *Candida* ChromAgar™, it can grow as multi-colony variants that can range from white to mauve, as seen in Figure 1. *C. auris* can grow comfortably either at 37°C or 42°C.

Figure 1: *Candida* ChromAgar™ with *C. auris* displaying multi-colony variants[9]

Differential diagnosis

The presence or suspicion of *C. auris* in clinical settings needs to be ruled out from other yeast isolates.

Laboratory identification

Although most laboratories can broadly classify yeast, most have limited capabilities to speciate and perform susceptibility testing on yeast isolates. Many laboratories have protocols for submitting yeast isolates to reference laboratories from sterile sites, and from persistent or difficult-to-treat infections. Additional confirmatory testing is necessary to rule out *C. auris* because *C. auris* can often be misidentified as other yeast, especially *C. haemulonii*. *C. auris* requires specialized identification methods. Note the following Council of State and Territorial Epidemiologists (CSTE) position statement:

> "Some yeast identification methods are unable to differentiate *C. auris* from other yeast species. *C. auris* can be misidentified as a number of different organisms when using traditional biochemical methods for yeast identification such as VITEK 2 YST, API 20C, BD Phoenix yeast identification system, and MicroScan".[10]

The full statement can be accessed here.

Table 1 outlines appropriate diagnostic methods and laboratory reporting protocols approved and not approved for *C. auris* identification. Figure 2 expands on the platforms that incorrectly identify *C. auris*.

Table 1: Commercial methods approved or not approved for the identification of *C. auris*

***Methods currently approved for *C. auris* identification**	**Methods NOT currently approved to identify *C. auris***

• Whole genome sequencing or marker gene sequencing of the internal transcribed spacer and D1/D2 regions
• Bruker's 6903 MSP RUO databases for Biotyper
• Specific bioMérieux identification platforms:
  o VITEK 2 YST (with Ver 8.01 software)**
  o VITEK (MALDI-TOF) MS RUO (with Saramis Ver 4.14 database and Saccharomycetaceae update)
• The GenMark ePlex Blood Culture Identification Fungal Pathogen (BCID-FP) Panel and BioFire FilmArray BCID2 have been FDA approved as molecular tests for *C. auris* identification in positive blood cultures
	• API 20C AUX (bioMérieux, Marcy l'Etoile, France)
	• BD Phoenix (BD Diagnostics, Sparks, MD)
	• MicroScan (Beckman Coulter, Pasadena, CA)
	• RapID™ YEAST PLUS System (ThermoFisher Scientific, Waltman, MA)

*Methods are continually evolving and advancing. This list is up-to-date as of 2024. CDC's MicrobeNet provides information for the most relevant laboratory identification methods, including MALDI-TOF, which has been curated by subject matter experts.[11] The Biotyper Classification Module, which was recently released as a collaboration between CDC and Bruker, provides MicrobeNet users with access to Bruker's most up-to-date database and CDC spectral libraries. The strains of *C. auris* represented in the MicrobeNet database have been proven to accurately classify to the species level on the Biotyper.[10]

**Misidentifications of certain clades of *C. auris* have been reported. Any *C. haemulonii, C. haemulonii* or non-identified *Candida spp.* identified on this platform would need further work-up to rule out *C. auris.*

Figure 2. Common yeast identification platforms that incorrectly identify *C. auris* as another yeast species

The Utah Communicable Disease Rule requires mandatory reporting to public health and submission of all *C. auris,* confirmed and suspected, and *C. haemulonii* isolates to the Utah Public Health Laboratory (UPHL) for identification and speciation (Utah Communicable Disease Rule R386-702, 2020). Correct identification and reporting of *C. auris* is essential for appropriate containment efforts.

Table 2 summarizes laboratory services offered at UPHL through the Antibiotic Resistance Laboratory Network (AR Lab Network). These include identification via MALDI-TOF (rule-out *C. auris*) and antifungal susceptibilities (AFST) for invasive and clinical infections and whole genome sequencing (WGS). UPHL can also perform colonization screening for *C. auris*, although approval

from the Utah Department of Health and Human Services (DHHS) Healthcare-associated Infections Antimicrobial Resistance (HAI/AR) Program is required first. More information about colonization screening can be found at UPHL AR Lab Network website. Additionally, any confirmed *C. auris* isolates will be reflexed to AFST and WGS will be performed to further characterize and link organisms to potential outbreaks.

Table 2: Laboratory services offered by UPHL for *C. auris* or other *Candida non-albicans* species

UPHL *Candida* testing	***C. auris* rule out**	**Antifungal susceptibility testing (AFST)**	***C. auris* colonization screening**
Organism tested	Any *Candida non-albicans*	Any *Candida non-albicans* detected in a non-sterile source	*C. auris*
Method	MALDI-TOF	Broth microdilution	PCR
Specimen collection	Isolated organism from any source collected for diagnosis/treatment	Isolated organism from any source collected for diagnosis/treatment	Bilateral Axilla-Groin E-swab
Transport	Ambient	Ambient	4-8°C**
Stability	Specimens are stable on appropriate media if kept in 4-8°C for 1 month	Specimens are stable on appropriate media if kept in 4-8°C for 1 month	Specimens are stable for 4 days after collection

*Confirmed *C. auris* or difficult-to-identify yeast isolates (suspected as *C. auris*) will be reflexed to whole genome sequencing (WGS) for confirmation of ID. WGS sequencing will also be used to study connections between isolates in potential outbreaks.

Treatment

C. auris is known to be a multidrug resistant pathogen, often resistant to fluconazole because of a resistance mutation of the Erg11 mutation.[3] Antifungal drugs called echinocandins are used to treat *C. auris* infections. However, since some isolates are resistant to all 3 classes of antifungals, high doses of multiple agents may be required to treat invasive infection.[12] Estimation of U.S. resistance and tentative breakpoints can be found in Table 3 and Table 4, respectively. Treatment is not recommended for colonized patients.[3] However, treatment is recommended for invasive site infections, or if there is evidence of clinical disease from *C. auris*. Although *C. auris* is commonly resistant to antifungal drugs, there is variability seen in susceptibility patterns between isolates.[3] As of 2022, there are no Clinical and Laboratory Standards Institute (CLSI) breakpoints available for *C. auris,* but tentative breakpoints are available. Tentative breakpoints should serve

as guidance, since correlation between clinical outcomes and microbiologic breakpoints are currently unknown.[3]

Table 3: Estimates of *C. auris* resistance patterns in the U.S.[13]

Antifungal class	% Resistance in the U.S.
Azoles***	88% (95-98%)
Polyenes	34%
Echinocandins	3%

*** Fluconazole resistance in the U.S. can vary based on geographic origin and presence of Erg11 resistance mutation.

Table 4. Tentative breakpoints of commonly used antifungal drugs for *C. auris*, adapted from CDC, 2020

Antifungal agent	Tentative resistant breakpoint	Comments
Triazole drug class		
Fluconazole	≥32	MIC mode calculations of fluconazole tested by CDC was ≥256; however, resistance mutation of the Erg11 gene responds to an MIC ≥32, corresponding to *C. auris* non-responsive to fluconazole for treatment.
Second generation azoles, (e.g., Voriconazole)	N/A	Fluconazole susceptibility can be used as a surrogate for second generation triazole susceptibility assessment. However, isolates resistant to fluconazole may respond to other triazoles occasionally. The decision to treat with another triazole should be made on a case-by-case basis.
Polyene drug class		
Amphotericin B	≥2	If using Etest for amphotericin B and an MIC of 1.5 is determined, that value should be rounded up to 2.

Echinocandin drug class		
Anidulafungin	≥4	
Caspofungin	≥2	
Micafungin	≥4	

Note.[13]

UPHL is able to conduct AFST for clinical or invasive *C. auris* infections. All therapeutic decisions should be ordered by a medical physician. Consultation with an infectious disease physician is recommended for clinical cases of *C. auris.* There are currently no known decolonization treatments that are effective or recommended for *C. auris*. Colonized patients are at a higher risk for developing invasive *C. auris* infection and should be monitored appropriately. For more information on AFST testing at UPHL, see the AR Lab Network website.

Case fatality

A meta-analysis of 742 cases of *C. auris* from across the globe determined a crude mortality rate of 29.75% (Sekyere, 2018). Other estimates on the case fatality have a range of 30-60% for *invasive C. auris* infections.[4]

Reservoir

C. auris is predominantly associated with healthcare settings, and in November 2022 Utah identified its first case of *C. auris*. In healthcare settings, *C. auris* can live on environmental surfaces (bed rails, door knobs, therapy equipment, etc.) and can also be present on the skin of colonized patients. Research shows *C. auris* can be cultured for up to 14 days from both dry and moist surfaces, as well as from bedding for up to 7 days.[14,15]

Transmission

Transmission can occur from colonized patients to other susceptible persons, from contaminated surfaces in healthcare settings, or from the hands of healthcare workers. Terminal cleaning of any room or any shared equipment is needed for any confirmed or suspected case of *C. auris.*[16] See EPA's List P for a current list of EPA-approved products for *C. auris*. If the products on List P are not accessible or otherwise suitable, facilities may use an EPA-registered hospital-grade disinfectant effective against *C. difficile* spores (List K) to disinfect *C. auris*.

Susceptibility

Risk factors for acquisition of *C. auris* include: a history of multidrug-resistant organism (MDRO) infections, underlying medical conditions (weakened immune system, devices like feeding/breathing tubes, catheters), frequent stays in healthcare settings, and/or high

antimicrobial usage.[17] That's why it's so important to identify colonized patients early to prevent the spread of *C. auris* in healthcare settings. Colonized patients should be placed on transmission-based precautions. Healthy people who come into contact with *C. auris* are at low risk of infection, but can harbor the organism on their skin.

Incubation period

The incubation period is not well defined. Host susceptibility factors can play a role in transition from colonization to invasive infection, however this is still under investigation.

Period of communicability

The period of communicability is still under investigation. Since there are no effective or recommended colonization treatments currently known, a person who is colonized or infected with *C. auris* is considered to be colonized indefinitely and should be considered capable of transmitting *C. auris*.

Epidemiology

Since *C. auris* surveillance and testing is just beginning, the full public health impact in Utah is unknown. As of January 2024, Utah has received 5 out-of-state *C. auris* cases and there are 2 in-state acquired cases. Containment is the overarching goal. Future surveillance will provide additional knowledge on the transmission, resistance patterns, and treatment response of *C. auris*.

While there is limited information regarding *C. auris* and *C. haemulonii,* the following trends have been observed:

- From January 2022–December 2022, there were 2,377 clinical cases and 5,754 screening cases of *C. auris* reported in the U.S.[18] *C. auris* infections can cause septicemia, and have a high mortality rate, particularly in immunocompromised and nursing home patients. Between 30% to 60% of *C. auris* patients with invasive infections die and *C. auris* has been found to colonize the skin of asymptomatic people.[10]
- Principal risk factors for *C. auris* and *C. haemulonii* infection include: recent surgery, recent broad-spectrum antibiotic or antifungal treatment, indwelling catheters, central venous catheters, and exposure to nursing homes and short- and long-term acute care hospitals.[14]

Public health control measures

Public health responsibility

Public health should be notified of all *C. auris* cases in Utah and will work with healthcare partners for containment and testing needs. Public health will conduct case and outbreak management. *C. auris* is currently considered a Tier 2 organism and should include the actions described in the outbreak investigation section in Table 5. Tier designation for *C. auris* may change with shifts in local prevalence. Recommended public health actions in different facility settings are summarized in Table 5. Depending on the local health department jurisdiction, investigations may be conducted by the state and/or local health department.

Admission screening is an important tool to prevent the spread of *C. auris* in Utah's healthcare facilities. Outbreaks in healthcare facilities can be traced to undetected colonized patients or misidentification of invasive infection. *C. auris* can spread rapidly in a healthcare setting. The criteria for admission screening selection is based on the risk factors for colonization.

Admission screening is recommended for new patients or residents who have had recent healthcare stays that were:[19]

- In a long term acute care hospital (LTACH)
- In a nursing home ventilator unit
- Outside of the U.S. or in states that have high *Candida auris* transmission rates (Nevada, California), particularly if additional risk factors are present, such as mechanical ventilation, prior history of carbapenem-resistant organisms, or a compromised immune system

Admission screening for *C. auris* is recommended as a preventive measure. Work with the DHHS HAI/AR team to schedule screenings at hai@utah.gov.

Types of screenings involved in healthcare settings

- Admission screening
    - Proactive screening to better understand the incidence of select organisms in the resident/patient population
- Point prevalence screening (PPS)
    - Both proactive and reactive screening
        - The CDC recommends screening be conducted at routine intervals for higher risk facilities (long-term acute care hospital, ventilator-capable skilled nursing facility, acute care settings)
        - Conducted as part of an outbreak response if a *C. auris* case is discovered at a facility

Table 5: Outbreak activity guidance

Containment tiers

Epidemic stages	Limited to moderate spread
Healthcare investigation	
Tiers with definitions	Mechanisms and organisms not regularly found in a region. Pan-not susceptible organisms with the potential for wider spread in a region

Response elements

Elements	Tier 2
Healthcare investigation	
Review the patient's healthcare exposures prior to and after the positive culture	**Always** **Typical review period:** 30 days prior to culture collection to present
Contact investigation	
Screening of healthcare contacts (residents and patients)	Always
Household contact screening	Rarely
Healthcare personnel screening	Rarely
Additional actions if transmission identified in healthcare	
Recurring response-driven point prevalence surveys	Always
Evaluate potential spread to healthcare facilities that regularly share patients with the index healthcare facility	Usually
Clinical laboratory surveillance	
Retrospective lab surveillance	Always
Prospective lab surveillance	Always
Environmental cultures	
Environmental sampling	Rarely
Infection control measures	
Notify healthcare providers; promptly implement appropriate	Always

transmission-based precautions	
Infection control assessment with observations of practice	Always
Clear communication of patient status with transferring facilities	Always

Always: actions that should be a part of every response for a given response tier; **Usually**: actions indicated for most responses, but that might not be applicable for all novel and targeted MDRO responses for a given response tier; **Rarely**: actions that generally are not performed for novel and targeted MDRO responses for organisms of a given response tier, but could be considered in certain situations. Decisions about implementing actions labeled "sometimes" or "rarely" should be made in consultation with public health.

Description of elements

Review the patient's healthcare exposures before and after the positive culture
(Tier 2: Always)
Obtain medical records from the facility or facilities associated with the patient. Use these medical records to observe cultures, healthcare visits, procedures, surgeries, services, travel history, etc., before and after the positive culture. This information can also be obtained through conversations with facilities but medical records are the most efficient.

Screen healthcare contacts (residents and patients)
(Tier 2: Always)
The scope of screening can be discussed with the facility. Screening must be scheduled through the DHHS HAI/AR Program via hai@utah.gov. In general, *C. auris* screening sites include:

- Skin (axilla/groin), wound (if applicable), sputum (if applicable)

At the very least, you will want to screen roommates but entire facility screening may be recommended depending on the organism and observed IPC practices. This process will help determine if or how much the organism has spread at the facility.

Household contact screening
(Tier 2: Rarely)
If the case is living in the community and not at a healthcare facility, household contact screening may be considered.

Healthcare personnel screening
(Tier 2: Rarely)
While rare, healthcare personnel screening may be recommended. This screening will be similar to that of resident/patient screening.

- Skin (axilla/groin)

Recurring response driven point prevalence surveys (PPS)
(Tier 2: Always)
The CDC recommends 2 negative PPS screenings at least 2 weeks apart before considering an outbreak closed. One negative screening does not mean the outbreak is over. It is not recommended to rescreen those who have already tested positive. A person who has previously tested positive and then tests negative will not change transmission-based precaution recommendations.

Evaluate potential spread to healthcare facilities that regularly share patients with the index healthcare facility
(Tier 2: Usually)
When you conduct a case investigation, determine any facilities that the case has been to before and after the reporting facility. Also reach out to the transferring and receiving facilities to see if they were notified of the person's *C. auris* status. Ask your healthcare facility contact about common healthcare facilities that they share patients with so that they can be alerted of potential cases.

Retrospective lab surveillance
(Tier 2: Always)
Facilities should look back at prior lab cultures to see if there have been other instances of organisms similar to that of the index case.

Prospective lab surveillance
(Tier 2: Always)
It is recommended that facilities continue to be on the lookout for organisms similar to that of their index case. Remind the facility to submit these organisms for further evaluation at UPHL.

Environmental sampling
(Tier 2: Rarely)
Environmental sampling may be recommended depending on the organism. This involves sampling high touch areas such as bed rails, physical therapy equipment, medical devices, sink areas, etc., to determine if there is a reservoir for the organism.

Notify healthcare providers; promptly implement appropriate transmission-based precautions
(Tier 2: Always)
One of the most important things to do is to notify healthcare providers of a case at their facility to make sure proper precautions are in place. As a reminder, EBP is recommended only for LTCF settings. In every other healthcare setting you would implement contact precautions.

Infection control assessment with observations of practice
(Tier 2: Always)
ICARs can give facilities an opportunity to have DHHS/LHD observe IPC practices and provide feedback. This gives your facility resources to deal with any gaps or barriers they may be experiencing and also highlights areas you are doing well.

Clear communication of patient status with transferring facilities
(Tier 2: Always)
It is always recommended to communicate the patient status to receiving facilities. This can be done through the interfacility transfer form or a phone call. Relaying the patient status is vital for continuation of precautions and reducing risk of transmission.

Prevention

Prevention is multi-faceted and includes multiple infection prevention and control (IPC) actions and recommendations:

- Place patients and residents colonized or infected with *C. auris* on transmission-based precautions as described on page 3.
- Perform admission screening as outlined in Figure 3.
- Follow basic IPC practices, such as hand washing and proper PPE use.
- Use dedicated equipment when possible.
- Ensure terminal environmental cleaning of rooms and clean and disinfect shared equipment with List P products.
- Communicate colonization status by using the Interfacility infection control transfer form to limit inter-facility spread.

Chemoprophylaxis

There is no known chemoprophylaxis available for *C. auris.*

Vaccine

There is no vaccine available for *C. auris.*

Isolation and quarantine requirements

Isolation: Patients in acute care facilities with past or present *C. auris*, either clinical or colonized, should be isolated in a private room and placed on contact precautions.

Nursing Homes: Residents with past or present *C. auris*, either clinical or colonized, may be placed on enhanced barrier precautions when criteria for contact precautions does not apply. Enhanced barrier precautions does not require a private room or isolation of the resident.

Quarantine: No requirements.

Case investigation

Reporting

All cases or suspect cases should be reported to public health within 3 working days per Utah Communicable Disease Rule R386-702, 2020. Immediate notification to the DHHS HAI/AR program via email hai@utah.gov is strongly recommended. Suspect isolates/organisms should also be submitted to UPHL for further testing and investigation. CSTE reporting criteria are summarized in Table 6.

Table 6: CSTE criteria to determine whether a case should be reported to public health

Criterion	Reporting
Clinical evidence	
None	
Laboratory evidence	
Detection of *C. auris* in a specimen using either culture or a culture independent diagnostic test (PCR)	S
Detection of an organism that commonly represents a *C. auris* misidentification in a specimen by culture. See Figure 2 for a comprehensive list.	S
Epidemiological evidence	
None	

Notes: S = This criteria alone is sufficient to report a case. A requisition or order for any of the "S" laboratory tests is sufficient to meet the reporting criteria.[10]

Case definition (2018)

Candida auris

CSTE and CDC have updated their case definitions for *C. auris* to exclude identification of *C. haemulonii* as part of the suspect case definition. DHHS will continue to use CSTE 2018 *C. auris* case definition due to low prevalence of *C. auris* and the limited number of laboratories serving Utah healthcare facilities with platforms to identify *C. auris*.

Laboratory Criteria

Confirmatory laboratory evidence:

- 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 (nucleic acid amplification test [NAAT]),

  OR

- 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 (NAAT)

Presumptive laboratory evidence:

- Detection of *C. haemulonii* from any body site using a yeast identification method that is not able to detect *C. auris*. See Table 1.
- Either the isolate/specimen is not available for further testing, or the isolate/specimen has not yet undergone further testing.

(Note: When additional test results are available, case re-classification may occur, including determination that it is not a case)

Confirmed

Clinical invasive or non-invasive: Person with confirmatory laboratory evidence from a clinical specimen collected for diagnosis or treatment of disease in the normal course of care. This includes specimens from sites reflecting invasive infection (blood, cerebrospinal fluid) and specimens from non-invasive sites such as wounds, urine, and the respiratory tract, where the presence of *C. auris* may simply represent colonization and not true infection.

Colonization: Person with confirmatory laboratory evidence from a swab collected for the purpose of screening for *C. auris* colonization regardless of site swabbed. Typical colonization/ screening specimen sites are skin (axilla, groin), nares, rectum, or other external body sites. Swabs from wound or draining ears are considered clinical.

Probable

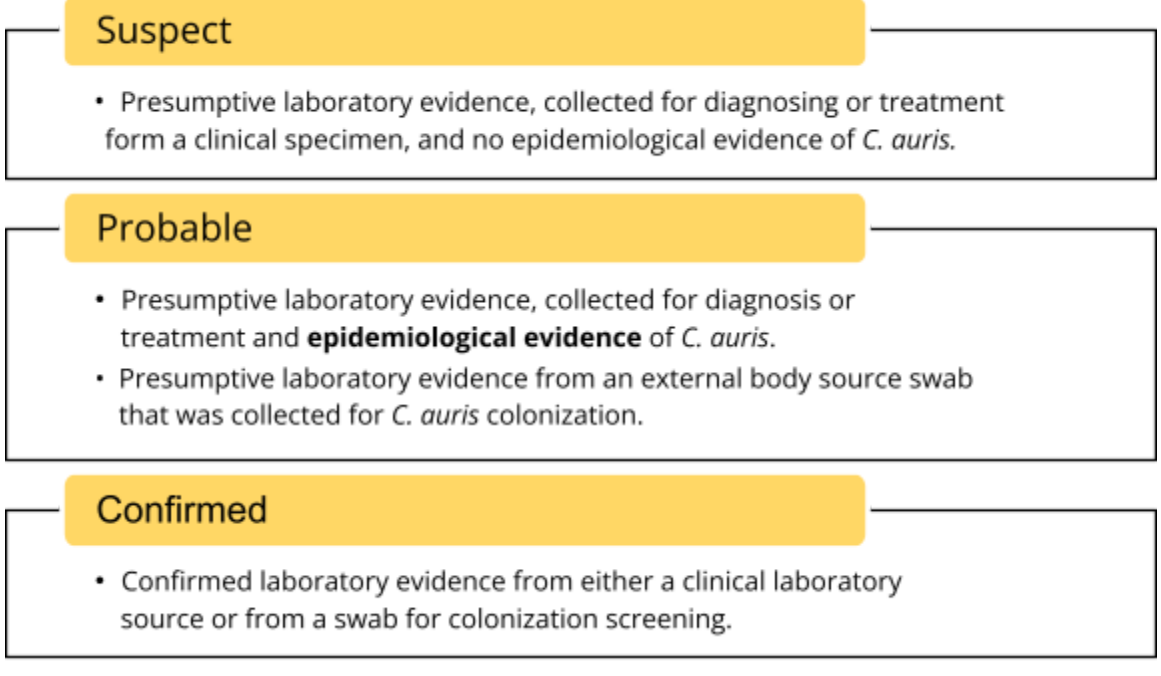
Clinical invasive or non-invasive: Person with presumptive laboratory evidence from a clinical specimen collected for diagnosis or treatment of disease in the normal course of care and evidence of epidemiologic linkage. A clinical specimen includes specimens from sites reflecting invasive infection (blood, cerebrospinal fluid) and specimens from non-invasive sites such as wounds, urine, and the respiratory tract, where presence of *C. auris* may simply represent colonization and not true infection.

Colonization: Person with presumptive laboratory evidence from a swab collected for screening for *C. auris* colonization regardless of site swabbed and evidence of epidemiologic linkage. Typical colonization/screening specimen sites are skin (axilla, groin), nares, rectum, or other external body sites. Swabs from wound or draining ears are considered clinical.

Suspect

Person with presumptive laboratory evidence from a clinical specimen collected for diagnosis or treatment of disease in the normal course of care and no evidence of epidemiologic linkage. A clinical specimen includes specimens from sites reflecting invasive infection (blood, cerebrospinal fluid) and specimens from non-invasive sites such as wounds, urine, and the respiratory tract, where presence of *C. auris* may simply represent colonization and not true infection.

Figure 4: Cheat sheet summary of definitions for suspect, probable and confirmed cases of *C. auris*



*18-ID-05[10]

Table 7: CSTE criteria for defining a case of *C. auris*

	Clinical cases			Colonization/screening cases	
	Clinical suspect	**Clinical probable**	**Clinical confirmed**	**Colonization/ screening probable**	**Colonization/ screening confirmed**
Clinical evidence					
None					
Laboratory evidence					
Detection of *C. auris* from any body site using either culture or culture independent diagnostic test (PCR)			N		N
Detection of *C. haemulonii* from any body site using a yeast identification method not able to detect *C. auris* (see Figure 2).	N	N		N	
Clinical specimen was obtained during the normal course of care	N	N	N		
Specimen from a swab was obtained for colonization screening				N	N
Isolate/specimen is not available for further testing or has not yet undergone further testing	N	N		N	
Epidemiologic evidence					
Resided within the same household with another person with confirmatory or presumptive laboratory evidence of *C. auris* infection or colonization		O			

Received care in the same healthcare facility as another person who had confirmatory or presumptive laboratory evidence of *C. auris* infection or colonization within the prior 12 months		O			
Received care in a healthcare facility that commonly shares patients with another facility that had a patient with confirmatory or presumptive laboratory evidence of *C. auris* infection or colonization within the prior 12 months		O			
Stayed overnight in a healthcare facility in the previous 1 year in a foreign country with documented *C. auris* transmission		O			
Absence of epidemiologic link to a confirmed case	N				
Criteria to distinguish a new case					
For clinical cases, count patient once regardless if a new event occurs	N	N	N		
For colonization/screening cases, count patient only once regardless of the interval between testing (assumes patient is always colonized)				N	N
A person with a colonization/screening case can later have a separate clinical case	N	N	N	N	N

A patient with a clinical case should not be counted as having a colonization/screening case thereafter	N	N	N	N	N
Received care in a healthcare facility that commonly shares patients with another facility that had a patient with confirmatory or presumptive laboratory evidence of *C. auris* infection or colonization within the prior 12 months		O			

Note: N = All N criteria in the same column are NECESSARY to classify a case. A number following an N indicates this criterion is only required for a specific disease/condition subtype (see below). If the absence of a criterion (i.e., criterion NOT present) is required for the case to meet the classification criteria, list the absence of criterion as a necessary component.
O = At least one of these O (ONE OR MORE) criteria in each category (categories = clinical evidence, laboratory evidence, and epidemiologic evidence) in the same column—in conjunction with all N criteria in the same column—is required to classify a case. A number following an O indicates this criterion is only required for a specific disease/condition subtype.[10]

Case investigation process

A full case investigation should be conducted on all probable and confirmed clinical and surveillance cases of *C. auris* by LHD investigators or designated state epidemiology personnel. This involves the investigator filling out the case investigation form in Appendix A which aims to gather risk factors and facility history information which should be used to identify potential contacts. The completed form should be attached under the notes section of UT-NEDSS (EpiTrax) and case status should be set in UT-NEDSS (EpiTrax) and then reviewed at the state level. A thorough facility history is necessary to populate the clinical tab in UT-NEDSS (EpiTrax) to enable the facility-centric module to be used to identify potential outbreaks.

a. **Suspect cases**

   Public health epidemiology action: No investigation is usually necessary. Coordinate with the facility to ensure contact precautions and facility transfer communication. Close case.

   Facility action: Contact precautions or enhanced barrier precautions recommended for duration of stay. Communicate status upon facility transfer.

b. Probable cases

Public health epidemiology action: If the case is newly-transmitted, conduct a *C. auris* case investigation. Use the case investigation form in Appendix A. Support laboratory efforts for identification of infection and/or colonization.

Facility action: Contact precautions or enhanced barrier precautions recommended for duration of stay. Communicate status upon facility transfer.

c. Confirmed cases

In Utah, confirmed cases will include *C. auris*—both clinical and screening isolates/testing.

Public health epidemiology action: If the case is newly transmitted, conduct a *C. auris* case investigation. Use the case investigation form in Appendix A. If facility transmission is suspected, offer an onsite assessment of the facility's infection prevention and control program. Increased suspicion of facility transmission may be a reason to begin an outbreak investigation. It is strongly recommended to conduct *C. auris* colonization screening for patients who have had contact with the case-patient.

Facility action: Contact precautions or enhanced barrier precautions recommended for duration of stay. Communicate status upon facility transfer. *C. auris* status must be communicated to the receiving facility in any facility transfer events. Use the Utah infection control transfer form for patient transfer between facilities.

d. Not a case

No public health action is needed for *Candida* spp. or other yeast species that have been ruled out as *C. auris*. These events should be closed in UT-NEDSS (EpiTrax) as not a case.

Outbreaks

An outbreak investigation is initiated by 1 case of *C. auris*. Outbreak investigations for confirmed and probable cases of *C. auris* fall under a Tier 2 investigation which includes the activities outlined in Table 5 and an onsite visit with an infection control assessment, lab lookback, and prospective surveillance. It is recommended you conduct a point prevalence screening on any contacts of the case(s), which includes both healthcare and household contacts along with any roommates. Other activities such as environmental sampling and healthcare personnel screening would be conducted on an as-needed basis only. All *C. auris* isolates from both clinical and environmental sources should be reflexed to sequencing. Whole genome sequencing (WGS) results can be used to produce connection trees of *C. auris* isolates and identify potential outbreaks.

Follow the actions and complete the checklist form in Appendix B, *C. auris* response plan, to respond to suspected case(s) of *C. auris*.

Identifying case contacts

Once identified, case contacts should be screened with sampling using an axillary/groin swab for *C. auris* using a ring surveillance strategy. This involves starting with the highest risk/closest contacts, such as roommates and moving outward to broader healthcare contacts, (those who share services such as wound and respiratory care). Case contacts include, but are not limited to:

- Roommates or close contacts of the positive case
- Shared services (wound care, physical therapy, urology services)
- Other patients in the same unit or patients cared for by the same healthcare staff

For more information, refer to the *C. auris* response plan in Appendix B.

Case contact management

- Colonization screening of facility; recommended at 2-week intervals
    - Rescreening of known positives is not recommended
- Isolate/cohort those who are positive
- Contact precautions and enhanced barrier precautions
- Terminal cleaning of patient area such as bed rails and linens and any shared equipment, such as physical therapy equipment
- Use dedicated equipment such as blood pressure cuff and lift sling when possible
- Use the interfacility infection control transfer form to notify the next provider and any outpatient provider of colonization status
- Call with stakeholders to coordinate containment and case management

References

1. Brooks, R. B., Walters, M., Forsberg, K., Vaeth, E., Woodworth, K., & Vallabhaneni, S. (2019). *Candida auris* in a U.S. patient with carbapenemase-producing organisms and recent hospitalization in Kenya. *MMWR. Morbidity and Mortality Weekly Report*, *68*(30), 664–666. https://doi.org/10.15585/mmwr.mm6830a3

2. Satoh, K., Makimura, K., Hasumi, Y., Nishiyama, Y., Uchida, K., & Yamaguchi, H. (2009). Candida auris sp. nov., a novel ascomycetous yeast isolated from the external ear canal of an inpatient in a Japanese hospital. *Microbiology and Immunology*, *53*(1), 41–44. https://doi.org/10.1111/j.1348-0421.2008.00083.x

3. Centers for Disease Control and Prevention. (2019, November 13). General information about candida auris. *Centers for Disease Control and Prevention*. Retrieved November 22, 2022, from https://www.cdc.gov/fungal/candida-auris/candida-auris-qanda.html

4. Spivak, E. S., & Hanson, K. E. (2018). Candida auris: An emerging fungal pathogen. *Journal of Clinical Microbiology*, *56*(2). https://doi.org/10.1128/jcm.01588-17

5. Cadnum, J. L., Shaikh, A. A., Piedrahita, C. T., Sankar, T., Jencson, A. L., Larkin, E. L., Ghannoum, M. A., & Donskey, C. J. (2017). Effectiveness of disinfectants against *candida auris* and other *candida* species. *Infection Control & Hospital Epidemiology*, *38*(10), 1240–1243. https://doi.org/10.1017/ice.2017.162

6. Lockhart, S. R., Etienne, K. A., Vallabhaneni, S., Farooqi, J., Chowdhary, A., Govender, N. P., Colombo, A. L., Calvo, B., Cuomo, C. A., Desjardins, C. A., Berkow, E. L., Castanheira, M., Magobo, R. E., Jabeen, K., Asghar, R. J., Meis, J. F., Jackson, B., Chiller, T., & Litvintseva, A. P. (2016). Simultaneous emergence of multidrug-resistant *Candida auris* on 3 continents confirmed by whole-genome sequencing and epidemiological analyses. *Clinical Infectious Diseases*, *64*(2), 134–140. https://doi.org/10.1093/cid/ciw691

7. Utah Communicable Disease Rule R386-702. (2020). Retrieved November 22, 2022, from https://coronavirus-download.utah.gov/Health-provider/R386-702-Communicable-Disease-Rule.pdf

8. Kathuria, S., Singh, P. K., Sharma, C., Prakash. A., Masih, A., Kumar, A., Meis, J. F., Chowdhary, A. (2015). Multidrug-Resistant Candida auris Misidentified as Candida haemulonii: Characterization by Matrix-Assisted Laser Desorption Ionization–Time of Flight Mass Spectrometry and DNA Sequencing and Its Antifungal Susceptibility Profile Variability by Vitek 2, CLSI Broth Microdilution, and Etest Method. *Journal of Clinical Microbiology*, 53(6), 1823-1830. https://doi.org/10.1128/jcm.00367-15

9. Centers for Disease Control and Prevention. (2020, May 29). Identification of *Candida auris*. *Centers for Disease Control and Prevention*. Retrieved November 22, 2022, from https://www.cdc.gov/fungal/candida-auris/identification.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Ffungal%2Fcandida-auris%2Frecommendations.html

10. Council of State and Territorial Epidemiologists (CSTE) (2022). Update to the Standardized Case Definition and National Notification for *Candida auris*. Retrieved January 23, 2024, from https://cdn.ymaws.com/www.cste.org/resource/resmgr/ps/ps2022/22-ID-05_C_auris.pdf

11. Centers for Disease Control and Prevention. (2022, June 30). *MicrobeNet*. Centers for Disease Control and Prevention. Retrieved November 22, 2022, from https://www.cdc.gov/microbenet/index.html

12. Kordalewska, M., Lee, A., Park, S., Berrio, I., Chowdhary, A., Zhao, Y., Perlin, D. S. (2018) Understanding echinocandin resistance in the emerging pathogen candida auris, 62(6). https://doi.org/10.1128/aac.00238-18

13. Centers for Disease Control and Prevention. (2020, May 29). *Antifungal Susceptibility Testing and Interpretation*. https://www.cdc.gov/fungal/candida-auris/c-auris-antifungal.html

14. Biswal, M., Rudramurthy, S., Jain, N., Jain, K., Yaddanapudi, L. and Chakrabarti, A. (2017). Controlling a possible outbreak of *Candida auris* infection: lessons learnt from multiple interventions. *The Journal of Hospital Infection, (97)*4, 363-370. https://doi.org/10.1016/j.jhin.2017.09.009

15. Welsh, R. M., Bentz, M. L., Shams, A., Houston, H., Lyons, A., Rose, L. J., & Litvintseva, A. P. (2017). Survival, Persistence, and Isolation of the Emerging Multidrug-Resistant Pathogenic Yeast *Candida auris* on a Plastic Health Care Surface. *Journal of Clinical Microbiology, 55*(10), 2996–3005. https://doi.org/10.1128/jcm.00921-17

16. Centers for Disease and Prevention. (2021, April 9). Healthcare Professions FAQ. *Centers for Disease Control and Prevention.* Retrieved April 9, 2024, from https://www.cdc.gov/fungal/candida-auris/c-auris-health-qa.html.

17. Centers for Disease Control and Prevention. (2022, July 12). Infection prevention and control for candida auris. *Centers for Disease Control and Prevention.* Retrieved November 22, 2022, from https://www.cdc.gov/fungal/candida-auris/c-auris-infection-control.html

18. Centers for Disease Control and Prevention. (2023, February 14). Tracking *candida auris*. *Centers for Disease Control and Prevention*. Retrieved February 2024, from https://www.cdc.gov/fungal/candida-auris/tracking-c-auris.html#:~:text=In%20the%20most%20recent%2012,January%202022%20%2D%20December%202022).&text=Data%20table%20showing%20data%20for%20the%20United%20States%20Map%20figure

19. Centers for Disease Control and Prevention. (2020, May 29). Screening for candida auris colonization. *Centers for Disease Control and Prevention*. Retrieved November 22, 2022, from https://www.cdc.gov/fungal/candida-auris/c-auris-screening.html

Version control

Updated January 2021: Created new disease plan.

Updated December 2022: Updated critical clinician information, Why is *candida auris* important to public health, Disease and epidemiology, Public health control measures, and Appendix B. Minor grammatical changes throughout. Updated references to APA 7th edition format.

Upudated January 2024: Updated the disease plan to have superscript in-text citations and updated references. Updated the modes of transmission section. Updated the laboratory test results section. Updated ‘ARLN to ‘AR Lab Network’. Updated the link to the new and updated interfacility form.

UT-NEDSS (EpiTrax) minimum/required fields by tab

Demographic

- First name
- Last name
- Age
- Date of birth
- Date of death
- Phone number
- Area code
- County
- Birth gender
- Race
- Street
- City
- State
- ZIP code

Clinical

- Admission date
- Clinician first name
- Clinician last name
- Clinician phone
- Date diagnosed
- Died
- Date of death
- Diagnostic facility
- Disease
- Health facility
- Hospitalized
- Onset date

Laboratory

- Collection date
- Lab
- Organism
- Result value
- Specimen source
- Test result
- Test type
- Units

Epidemiological

- Date of exposure
- Exposure city
- Exposure name
- Exposure place type
- Food handler
- Group living
- Healthcare worker
- Imported from
- Other Data 1
- Other Data 2

Investigation

- Had a fever and pneumonia
- Other relevant details:
- Date patient admitted to reporting facility?
- Was the patient transferred from another facility?
- Transferred from where?
- Type of facility patient was transferred from
- Date of transfer
- Was this infection healthcare facility acquired?
- Has the healthcare facility taken measures to prevent further spread of the organism, if warranted?

Contacts

- N/A

Reporting

- Date first reported to public health

Administrative

- LHD investigation/intervention started
- Outbreak-associated
- Outbreak name
- State case status

Candida auris infection rules for entering laboratory test results

The following rules describe how laboratory results reported to public health should be added to new or existing events in UT-NEDSS (EpiTrax). These rules have been developed for the automated processing of electronic laboratory reports (ELR), although they also apply to manual data entry.

Test-specific rules

Test specific rules describe what test type and test result combinations are allowed to create new morbidity events in UT-NEDSS (EpiTrax), and what test type and test result combinations are allowed to update existing events (morbidity or contact) in UT-NEDSS (EpiTrax).

Test type	Test result	Create a new event	Update an existing event
C. auris culture	Positive	Yes	Yes
	Negative	No	Yes
	Indeterminate	Yes	Yes
C. haemulonii culture	Positive	Yes	Yes
	Negative	No	Yes
	Indeterminate	Yes	Yes
Other rare *Candida* spp. or *Candida spp*. from sterile sites implicated in invasive disease that cannot be accurately speciated**	Positive	Yes	Yes
	Negative	No	Yes
	Indeterminate	Yes	Yes
C. auris PCR	Positive	Yes	Yes
	Negative	No	Yes
	Indeterminate	Yes	Yes
C. haemulonii PCR	Positive	Yes	Yes
	Negative	No	Yes
	Indeterminate	Yes	Yes

Note: **Exclude *C. albicans, C. parapsilosis, C. dubliniensis, C. lusitaniae*, *C. tropicalis,* and *C. kruseil* and any other yeast infections that do not fit the above criteria.

Whitelist rules

Whitelist rules describe how long an existing event can have <u>new</u> laboratory data appended to it. If a laboratory result falls outside the whitelist rules for an existing event, it should not be added to that event, and should be evaluated to determine if a new event or client medical record (CMR) should be created.

Graylist rule

Graylist rules describe how long an existing event can have an <u>old</u> laboratory result appended to it. We often receive laboratory reports through ELR that cannot create cases, but can be useful if a case is created in the future. These laboratory results go to the graylist.

***C. auris* infection morbidity whitelist rule:** Never a new case.

***C. auris* infection contact whitelist rule:** Never added to contact.

***C. auris* infection graylist rule:** If the specimen collection date of the laboratory result is 90 days before or up to 90 days after the event date of the morbidity event, the laboratory result should be added to the morbidity event.

Other electronic laboratory processing rules

If an existing event has a state case status of not a case, ELR will never add additional test results to that case. New labs will be evaluated to determine if a new CMR should be created.

Appendices

Appendix A: *Candida auris* case investigation form

Patient demographics				
First name:	Middle name:			
Last name:				
Date of birth:				
Parent/guardian:				
Address:				
City:	State:	ZIP:		
Is this address for a long-term care hospital or nursing home?	☐ Yes	☐ No		
Name of facility:	Facility type:			
Phone number:	Sex: ☐ M ☐ F			
Email address:				
Primary language:				
Ethnicity		Race		
☐ Not Hispanic or Latino	☐ Hispanic or Latino	☐ White	☐ Black or African American	
		☐ American Indian or Alaska Native	☐ Asian	
		☐ Native Hawaiian or Other Pacific Islander	☐ Unknown	
Clinical information				
Onset date (first date of symptoms):	Date of *Candida spp.* specimen collection:			
Type(s) of sample (check all that apply)				
☐ Unknown	☐ Blood	☐ Urine	☐ Sputum	☐ Bronchoalveolar Lavage (BAL)
☐ Wound	☐ Other sterile site:			
Type of case	☐ Clinical	☐ Screening/surveillance		
If clinical case, did patient previously have a positive screening or surveillance	☐ Yes	☐ No		

culture?		
Was antifungal susceptibility testing (AFST) performed?	☐ Yes	☐ No
If AFST was performed, record MICs		
Fluconazole	Voriconazole	Amphotericin
Micofungin	Caspofungin	Anidulafungin

Laboratory report form

What methods are used for AFST?			
☐ Broth Microdilution	☐ E-test	☐ Automatic	☐ Other

Was it initially misidentified?	☐ Yes	☐ No
If yes, which method was used?	☐ API 20C Aux	☐ VITEK-2
☐ Phoenix	☐ MicroScan	☐ Other:
If yes, as what?	☐ *Candida haemulonii*	☐ *Candida famata*
☐ *Candida sake*	☐ *Candida spp.*	☐ Other
Was the patient known to be colonized with any other multidrug-resistant organisms, (CRE, CRA, CRPA MRSA, or VRSA)?	☐ Yes (please specify):	☐ No

Healthcare encounters

At the time of *C. auris* specimen collection, was the patient admitted in a healthcare facility?	☐ Yes	☐ No

Facility name:			Facility type:			
Facility address:			Was the patient in contact precautions for the duration, or part of their stay?		Was this infection healthcare facility acquired? (In a facility 2 days prior to culture collection and no previous positive culture?)	
Facility city:	Facility state:	Facility ZIP:	☐ Duration	☐ Part of stay	☐ Yes	☐ No

Was the patient admitted to the facility?	☐ Yes	☐ No	Admit date:		Discharge date:	
			Died from illness?	☐ Yes	☐ No	Date of death:
From where was the patient admitted?	☐ Home	☐ Facility, specify:		☐ Other:		
To where was the patient discharged?	☐ Home	☐ Facility, specify:		☐ Other:		
Was the patient admitted to an intensive care unit (ICU) in the past 6 months?	☐ Yes	☐ No	Facility name: Length of stay:			
Date of admission to the ICU	___/___/____		Date of discharge from the ICU	___/___/____		
Locations of patient during hospitalization						
Unit/floor:	Room:	Dates: ___/___/____to___/___/____	On contact precautions?	☐ Yes	☐ No	
Unit/floor:	Room:	Dates: ___/___/____to___/___/____	On contact precautions?	☐ Yes	☐ No	
Unit/floor:	Room:	Dates: ___/___/____to___/___/____	On contact precautions?	☐ Yes	☐ No	
Unit/floor:	Room:	Dates: ___/___/____to___/___/____	On contact precautions?	☐ Yes	☐ No	
Did the patient have a roommate (or ward mates, if general ward) at any point while not on contact precautions?				☐ Yes	☐ No	

Risk factors			
Was the patient admitted to an ICU in the past 6 months?	☐ Yes	☐ No	Facility name: Month/year:
Was the patient transferred to any other facility from the reporting facility?	☐ Yes	☐ No	Receiving facility name: Month/year:
☐ Acute care hospital	☐ Long-term care facility		☐ Long-term acute care hospital
Was MDRO status communicated to the receiving facility (facility transfer form used)?	☐ Yes	☐ No	
Has the patient had any surgical procedures in the past year?	☐ Yes	☐ No	
List surgical procedures:			
Has the patient had any out-patient procedures in the past year?	☐ Yes	☐ No	
List out-patient procedures:			
Is the patient bed-bound?	☐ Yes	☐ No	

Underlying medical conditions (check all that apply)				
☐ Diabetes	☐ Hemodialysis	☐ Chronic liver disease	☐ Chronic respiratory disease	☐ Chronic renal disease
☐ HIV (not AIDS)	☐ AIDS/CD4 count >200	☐ Transplant recipient	☐ Other immunosuppressed state:	
☐ Cancer:		☐ Other:		

Has the patient had exposure to any of the following devices in place in the past 6 months? (check all that apply)			
☐ Mechanical ventilation	☐ Central venous catheter	☐ Peripheral IV	☐ Dialysis catheter
☐ Urinary catheter	☐ Endotracheal intubation	☐ Gastrostomy tube	☐ NG tube
☐ Tracheostomy	☐ Nephrostomy tube	☐ Surgical drain	☐ Hemodialysis
☐ Intra-abdominal drain or catheter	☐ Surgical drain	☐ Other surgical procedure or device (please specify):	☐ Intra-abdominal drain or catheter

Travel history			
Has the patient traveled outside of the country in the past year?		Location:	Date:
☐ Yes	☐ No	Location:	Date:
Did the patient receive medical care outside of the U.S.?		Location:	Date:
☐ Yes	☐ No	Location:	Date:

Treatment history		
In the 2 weeks prior to the *C. auris* specimen collection:		
Did the patient receive broad spectrum antibiotics?	☐ Yes	☐ No
Did the patient receive antifungal medication?	☐ Yes	☐ No
If yes, please specify antifungal (e.g., fluconazole):		
After the *C. auris* was identified, did the patient receive antifungal medication?	☐ Yes	☐ No

If yes, please specify antifungal (e.g., fluconazole) and treatment dates:

_____ ____/____/_____to____/____/_____

_____ ____/____/_____to____/____/_____

_____ ____/____/_____to____/____/_____

_____ ____/____/_____to____/____/_____

_____ ____/____/_____to____/____/_____

_____ ____/____/_____to____/____/_____

_____ ____/____/_____to____/____/_____

_____ ____/____/_____to____/____/_____

_____ ____/____/_____to____/____/_____

_____ ____/____/_____to____/____/_____

_____ ____/____/_____to____/____/_____

Contacts		
Please list all contacts below and indicate if they are a familial contact, healthcare worker contact, or facility roommate.		
Name:	Phone number:	Contact type:
Name:	Phone number:	Contact type:
Name:	Phone number:	Contact type:

Name:	Phone number:	Contact type:
Name:	Phone number:	Contact type:
Name:	Phone number:	Contact type:
Name:	Phone number:	Contact type:
Name:	Phone number:	Contact type:
Name:	Phone number:	Contact type:
Name:	Phone number:	Contact type:
Name:	Phone number:	Contact type:
Additional notes:		

Appendix B: *Candida auris* response plan

DHHS: *Utah Department of Health and Human Services,* ***UPHL****: Utah Public Health Laboratory,* ***LHD****: Local Health Department,* ***IP****: Infection Preventionist,* ***ICS****: Incident Command Structure,* ***HAI/AR****: Healthcare-associated Infections/Antimicrobial Resistance Program,* ***AR Lab Network****: Antibiotic Resistance Laboratory Network,* ***MALDI****: Matrix Assisted Laser Desorption/Ionization.*

Immediate actions

Public health actions

- Notify DHHS chain of command Date completed_____
    - HAI/AR program manager
    - Office of Communicable Diseases director
    - State epidemiologist
    - All of HAI/AR program
- Notify relevant LHD contacts Date completed_____

Facility IP actions

- Communicate with IPs to ensure they are aware of the situation
  Date completed_____
- Send IPs the Infection Prevention and Control for *Candida auris* document and CDC Fact Sheet
- Isolate the patient(s) Date completed_____
- Switch to using a List P cleaning agent
  Date completed_____

Clinical lab actions

- Contact clinical lab Date completed_____
- Make sure the lab saves the isolate and ask the lab to send the isolate to UPHL for further testing
  Date completed_____
- If there are questions about coordinating isolate shipment to UPHL, contact arlnutah@utah.gov.
  Date completed_____

UPHL

☐ Notify the infectious disease chief scientist and microbiology technical supervisor about the situation so they can be on the lookout for the isolate
Date completed_____

☐ UPHL will identify the isolate with MALDI Date completed_____

After *Candida auris* case is confirmed

☐ Initiate public health coordination call (should mimic an ICS call)
Date completed_____

- Who should be involved?
  - DHHS
    - HAI/AR investigator(s)
    - HAI/AR IP(s)
    - HAI/AR program manager
    - Office of Communicable Diseases director
    - State epidemiologist
  - LHD
    - HAI investigator
    - Local health officer
  - UPHL
    - Infectious disease chief scientist
    - Microbiology technical supervisor
    - NGS chief scientist
    - AR Lab Network regional lab coordinator

- Call objectives
  - Use HAI outbreak template to determine roles and responsibilities of DHHS and LHD
  - Schedule time for next call with the facility(ies)

☐ Set up a call with CDC (haioutbreak@cdc.gov) Date completed_____

- Discuss plan and make sure we plan all of the appropriate containment actions

☐ Coordinate with LHD to call IP and/or clinical lab Date completed_____

- Request all non-albicans yeast isolates, excluding vaginal sources, in the preceding 6 months to identify other potential causes
- Conduct case investigation of index patients(s) and enter the cases into EpiTrax

☐ Set up a call with public health/relevant facilities Date completed_____

- Who to include?
    - IP and leadership at the facility where the patient was diagnosed
    - IP and leadership at facility where the patient is currently admitted (if transferred)
    - IP and leadership at any facility where the patient was in the 6 months prior to diagnosis
    - DHHS
    - UPHL (including AR Lab Network lab coordinator)
    - LHD

- Call objectives
    - Discuss overview of the current situation
    - Discuss the tiered investigation activities
    - Schedule an onsite facility visit
        - Conduct an infection control assessment and response (ICAR) interview
        - Conduct infection control observations
        - Discuss recommendations for colonization screening
        - Compile a list of high-risk patients for screening
            - Roommates
            - Any patients with shared services and/or shared equipment with index cases(s)
            - Any patients with a carbapenem-resistant organism (CRO)
            - Any patients with travel history (international travel or travel from any states with identified cases of *Candida auris*).

- Ask the facility to provide a few dates for screening. The AR Lab Network lab coordinator will schedule the screening and ensure the lab has capacity to process and test the samples on the requested dates.
    - Generally, this needs to be completed Monday–Wednesday.