

Candida auris

Lab Surveillance

Developing a *C. auris* Surveillance Plan

Health care facilities are strongly encouraged to develop a plan to detect patients/residents with *C. auris* in their facility

Individual health care facility surveillance plans should be based on:

- their current local epidemiology
- patients/residents at higher-risk for *C. auris* in the facility/unit (e.g., patient acuity, type of care provided)
- laboratory capacity for *C. auris* identification from clinical cultures and colonization screening testing

C. auris Surveillance Strategies

Clinical Culture Surveillance

- Identify *Candida* isolates to the species-level in a specimen collected during the course of clinical care for the purpose of diagnosis or treatment of disease, (e.g., blood, urine, respiratory, wound)

Colonization Screening

- Identify *C. auris* in a sample collected to detect colonization for the purpose of implementation of appropriate infection prevention and control measures, (e.g., axilla/groin swab)

Clinical Culture Surveillance

Identify *Candida* isolates to the species-level:

- Recommended routinely for all normally sterile body site specimens
 - Blood, CSF, other sterile body fluids
- Consider strategies for non-sterile site cultures depending on lab resources, local epidemiology, patient risk factors
 - Urine, respiratory, wounds, etc.

Clinical Culture *Candida* ID: Self Assessment

What is the current capacity to perform fungal ID in your lab?

Can the lab identify *C. auris* on culture?

- Which method(s) are used?

Which specimen types are *Candida* routinely ID'd from?

Which specimen types does *Candida* ID need to be requested?

If *Candida* are not routinely ID'd from all specimen types, what is the capacity to expand?

Clinical Culture *Candida* ID: Lab Resources

CDC Information on Identification of *Candida auris*

- <https://www.cdc.gov/fungal/candida-auris/identification.html>

MDHHS Bureau of Laboratories can provide isolate ID for *C. auris*

- *Fungal Culture Referral under A-Z Testing Menu*
- <https://www.michigan.gov/mdhhs/doing-business/providers/labservices/a-z-test-listing>

Clinical Culture *Candida* ID: Lab Resources

Reference isolates for validations are available

- *American Type Culture Collection*
- <https://www.atcc.org/>
- *CDC & FDA AR Isolate Bank*
- <https://wwwn.cdc.gov/arisolatebank/overview>

Lab Safety Resources

- <https://www.cdc.gov/fungal/candida-auris/c-auris-lab-safety.html>

Clinical Culture *Candida* ID: Lab Resources

Antifungal Susceptibility Testing

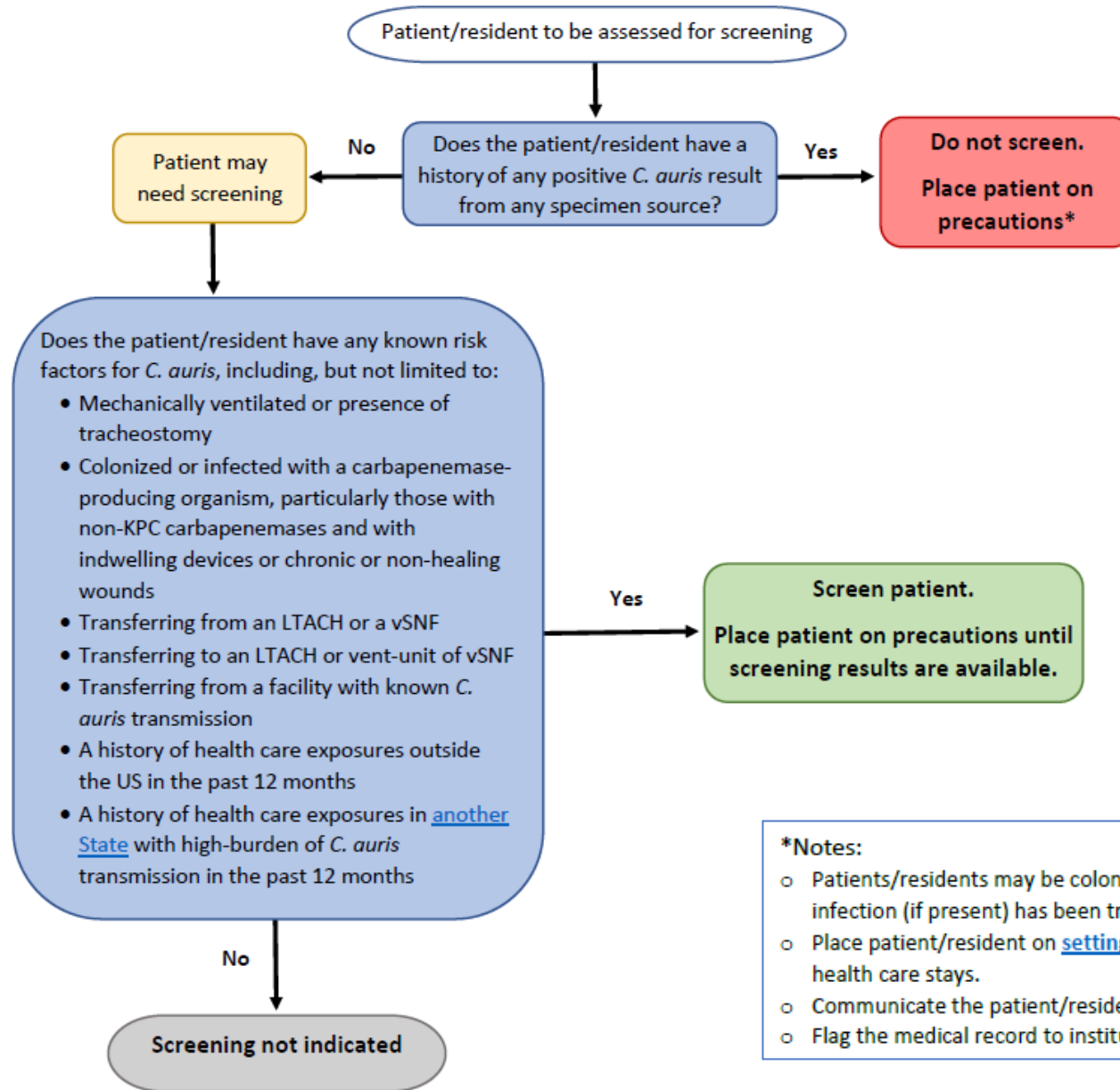
- No current breakpoints available for *C. auris*
- CDC interpretive guidelines based upon susceptibility data of other *Candida* species
 - <https://www.cdc.gov/fungal/candida-auris/c-auris-antifungal.html>
- *C. auris* susceptibility testing should be conducted following Clinical Laboratory Standards Institute (CLSI)
 - <https://clsi.org/standards/products/microbiology/documents/m27/>
 - <https://clsi.org/about/blog/ast-news-update-june-2022-hot-topic/>
- Isolates submitted to MDHHS BOL are forwarded to the AR Lab Network for additional testing

Colonization Screening

Consider screening patients at higher-risk for *C. auris*:

- Mechanically ventilated or presence of tracheostomy
- Colonized or infected with a carbapenemase-producing organism, particularly those with non-KPC carbapenemases and have indwelling devices or chronic non-healing wounds
- Transferring from an LTACH or vSNF
- Transferring to an LTACH or ventilator unit of a vSNF
- Transferring from a facility with known *C. auris* transmission
- A history of health care exposures outside the United States in the past 12 months
- A history of health care exposures in another US State with high-burden of known *C. auris* transmission in the past 12 months

Admission Screening Assessment Flowchart



Admission Screening Assessment Checklist

For each patient/resident to be evaluated for *Candida auris* admission screening complete the following assessment:

Q1. Does the patient/resident have a history of any positive *Candida auris* result from any specimen source?

A prior history of *C. auris* colonization could be assessed by reviewing medical records, laboratory reports, consultation with a referring health care facility, and/or asking the patient/resident or their medical power of attorney/family members “Have you ever been told you had an infection with *Candida auris*?” or “Have you ever been told that you had a test which was positive for *Candida auris*?”.

- ☐ **Yes, the patient/resident has a history of *C. auris* infection or colonization:**
 - Do Not Screen the patient/resident.
 - Place the patient/resident on [setting-appropriate transmission-based precautions](#).
 - Communicate the patient/resident’s *C. auris* status to all health care personnel involved in their care.
 - Flag the medical record to institute infection prevention precautions upon any future readmission.
- ☐ **No, the patient/resident has no known history of *C. auris* infection or colonization:**
 - The patient/resident may need *C. auris* screening, **proceed to Q2 below**.

Q2. Does the patient/resident meet any of the following criteria?

- Mechanically ventilated or presence of tracheostomy
- Colonized or infected with a carbapenemase-producing organism, particularly those with non-KPC carbapenemases and have indwelling devices or chronic non-healing wounds
- Transferring from an LTACH or vSNF
- Transferring to an LTACH or ventilator unit of a vSNF
- Transferring from a facility with known *C. auris* transmission
- A history of health care exposures outside the United States in the past 12 months
- A history of health care exposures in [another US State](#) with a high-burden of *C. auris* transmission in the past 12 months
- ☐ **Yes, the patient/resident meets one or more of the above criteria:**
 - Screen the patient/resident, depending on [local epidemiology](#), health care setting, and available resources.
 - Place the patient/resident on [setting-appropriate transmission-based precautions](#) while awaiting screening results.
- ☐ **No, the patient/resident does not meet any of the above criteria:**
 - Colonization screening not indicated at this time.

Colonization Screening: Self Assessment

HCF Operations

Does the facility perform active surveillance screening for other organisms?

- Opportunity to leverage existing resources?

How are/can patients targeted for screening identified on admission?

- Referring HCF
- Admission location
- MDRO history
- Clinical status: presence of vent/trach, indwelling devices, wounds
- Travel history

Colonization Screening: Self Assessment

HCF Operations

Process elements to consider for a screening program:

- Assessment for screening
- Test ordering
- Who is performing specimen collection
- Specimen handling to lab
- Infection prevention precautions while awaiting results
- Communication and documentation of results

Colonization Screening: Self Assessment

Laboratory

Is screening testing available or developing in-house?

- What method(s) will be used?
- Validation/verification

Or is testing available from existing commercial or reference laboratory provider?

Colonization Screening: Lab Resources

CDC guidance for detection of *C. auris* colonization

- PCR (preferred) and culture-based methods
- <https://www.cdc.gov/fungal/candida-auris/c-auris-guidance.html>

CDC Real-time PCR Protocol

- <https://www.cdc.gov/fungal/candida-auris/pdf/Real-time-PCR-based-Id-C-auris-508.pdf>
- *Positive specimens should be cultured to recover and isolate for submission to BOL*

Procedure for collection of patient swabs (axilla/groin)

- <https://www.cdc.gov/fungal/candida-auris/c-auris-patient-swab.html>

Colonization Screening: Lab Resources

Commercial and Reference Laboratories offering *Candida auris* Testing

Laboratory Name	Methodology	Test Order Information (order code)	Contact Information
ARUP	Culture^	Yeast/Fungal Culture (0060149)	www.aruplab.com 1-800-522-2787
		Yeast ID (0060163)	
LabCorp	Culture	Yeast/Fungal Culture (182776)	www.labcorp.com
		Yeast ID (182212)	
Mayo	PCR	Candida auris surveillance (CAURS 607883)	www.mayocliniclabs.com mcl@mayo.edu 1-800-533-1710
	Culture	Yeast ID (FUNID 8223)	
Quest	PCR	PCR (10153)	www.questdiagnostics.com 1-866-697-8378
	Culture	Yeast/Fungal Culture (20541)	
		Yeast ID (39507)	

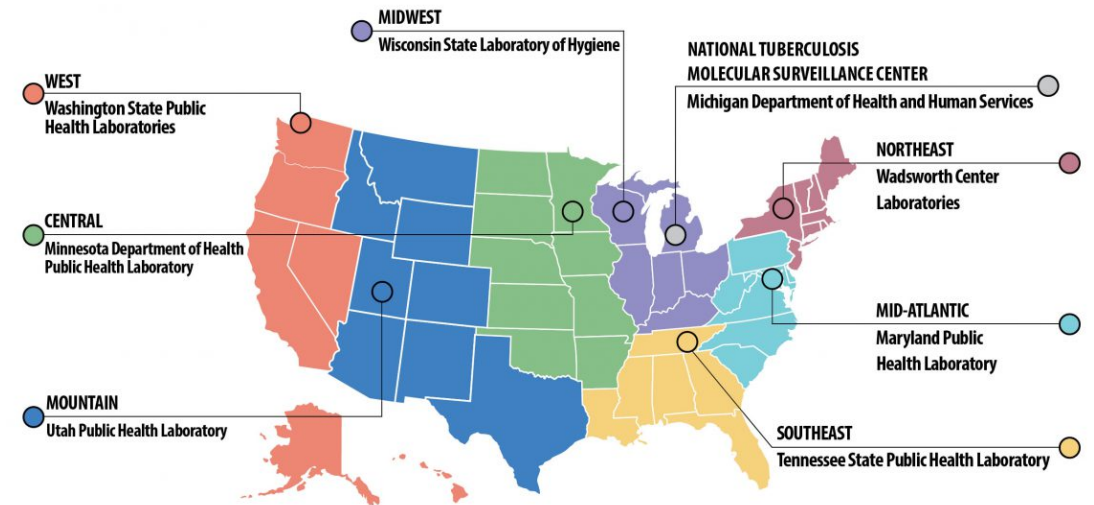
^ For suspected *C. auris* cases, lab requests including specimen source and note indicating *C. auris* rule out

Disclaimer: The provided list is not all inclusive and additional laboratories may be available. The list above is provided for educational purposes and does not reflect preferences or recommendations of Michigan Department of Health and Human Services. Michigan Department of Health and Human Services does not assume liability or responsibility for any representations made by a laboratory regarding capabilities.

Colonization Screening: Lab Resources

CDC's AR Lab Network

- PCR-based screening testing
- Results usually available within 48 hours of sample receipt
- Testing provided only through consultation with SHARP Unit
- <https://www.cdc.gov/drugresistance/ar-lab-networks/domestic.html>



Colonization Screening: Other Resources

Frequently asked Questions about Screening for *Candida auris*

- <https://www.cdc.gov/fungal/candida-auris/c-auris-screening-info.html>

Fact Sheet on *Candida auris* Testing

- <https://www.cdc.gov/fungal/candida-auris/fact-sheets/c-auris-testing.html>

Public Health Reporting

Candida auris

Report any laboratory finding that meets either of the following criteria:

- Detection of *C. auris* in a specimen using either culture or a culture-independent diagnostic test (CIDT) (e.g., Polymerase Chain Reaction [PCR])
- Detection of an organism that commonly represents a *C. auris* misidentification in a specimen by culture (e.g., *Candida haemulonii*)
 - Reports to Michigan Disease Surveillance System (MDSS)
 - Phone call or email to SHARP unit always appreciated

Laboratories shall immediately submit **confirmed or suspect *C. auris* isolates** (clinical or screening) to the MDHHS Lansing laboratory

2023 REPORTABLE DISEASES IN MICHIGAN – BY PATHOGEN

A Guide for Physicians, Health Care Providers and Laboratories

Report the following conditions to the Michigan Disease Surveillance System (MDSS) or local health department (see reverse) within 24 hours if the agent is identified by clinical or laboratory diagnosis. See footnotes for exceptions.

Report the unusual occurrence, outbreak or epidemic of any disease or condition, including healthcare-associated infections.

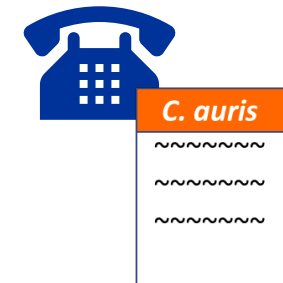
Acute flaccid myelitis (1)	Legionella species (Legionellosis) (5)
Anaplasma phagocytophilum (Anaplasmosis)	Leptospira species (Leptospirosis)
Arboviral encephalitis, neuro- and non-neuroinvasive:	Listeria monocytogenes (Listeriosis) (5, 6)
Chikungunya, Eastern Equine, Jamestown Canyon, La Crosse, Powassan, St. Louis, West Nile, Western Equine, Zika (6)	Measles virus (Measles/Rubeola) (6)
Babesia microti (Babesiosis)	Meningitis: bacterial, viral, fungal, parasitic, and amebic
Bacillus anthracis and B. cereus serovar anthracis (Anthrax) (4)	Multisystem Inflammatory Syndrome in Children (MIS-C) and in Adults (MIS-A)
Blastomyces dermatitidis (Blastomycosis)	Mumps virus
Bordetella pertussis (Pertussis)	Mycobacterium leprae (Leprosy or Hansen's Disease)
Borrelia burgdorferi (Lyme Disease)	Mycobacterium tuberculosis complex (Tuberculosis); report preliminary and final rapid test and culture results (4)
Brucella species (Brucellosis) (4)	Neisseria gonorrhoeae (Gonorrhea) (3, 6) (4, submit isolates from sterile sites only)
Burkholderia mallei (Glanders) (4)	Neisseria meningitidis, sterile sites (Meningococcal Disease) (5)
Burkholderia pseudomallei (Melioidosis) (4)	Orthopox viruses, including: Smallpox, Mpox (4)
Campylobacter species (Campylobacteriosis)	Plasmodium species (Malaria)
Candida auris (Candidiasis) (4)	Poliovirus (Polio)
Carbapenemase Producing – Carbapenem Resistant Enterobacteriales (CP-CRE): all genera (4)	Prion disease, including CJD
Chlamydia trachomatis (Trachoma, genital infections, Lymphogranuloma venereum (LGV)) (3, 6)	Rabies virus (4)
Chlamydia pneumoniae (Pneumonia) (4)	Rabies: potential exposure and post exposure prophylaxis (PEP)
Clostridium botulinum (Botulism) (4)	Rickettsia species (Spotted Fever)
Clostridium tetani (Tetanus)	Rubella virus (6)
Coccidioides immitis (Coccidioidomycosis)	Salmonella species (Salmonellosis) (5)
Coronaviruses, Novel; including deaths and SARS-CoV-2 variant identification (SARS, MERS-CoV, SARS-CoV-2) (5)	Salmonella Paratyphi (Paratyphoid Fever): serotypes Paratyphi A, Paratyphi B (tartrate negative), and Paratyphi C (5)
Corynebacterium diphtheriae (Diphtheria) (5)	Salmonella typhi (Typhoid Fever) (5)
Coxsackievirus (Q Fever) (4)	Shigella species (Shigellosis) (5)
Cronobacter sakazakii (4, blood or CSF only, from infants < 1 year of age)	Staphylococcus aureus Toxic Shock Syndrome (1)
Cryptosporidium species (Cryptosporidiosis)	Staphylococcus aureus, vancomycin intermediate/resistant (VISA) (5)/VISA (4)
Cyclospora species (Cyclosporiasis) (5)	Streptococcus pneumoniae, sterile sites
Dengue virus (Dengue Fever)	Streptococcus pyogenes, group A, sterile sites, including Streptococcal Toxic Shock Syndrome (STSS)
Ehrlichia species (Ehrlichiosis)	Treponema pallidum (Syphilis) (6)
Encephalitis, viral or unspecified	Trichinella spiralis (Trichinellosis)
Escherichia coli, O157:H7 and all other Shiga toxin positive serotypes (including HUS) (5)	Varicella-zoster virus (Chickenpox) (6)
Francisella tularensis (Tularemia) (4)	Vibrio cholera (Cholera) (4)
Giardia species (Giardiasis)	Vibrio species (Vibriosis: non-cholera species) (5)
Guillain-Barre Syndrome (1)	Yellow fever virus
Haemophilus ducreyi (Chancroid)	Yersinia enterocolitica (Yersiniosis) (5)
Haemophilus influenzae, sterile sites (5, submit isolates for serotyping for patients <15 years of age)	Yersinia pestis (Plague) (4)
Hantavirus	
Hemorrhagic Fever Viruses (4)	
Hepatitis A virus (Anti-HAV IgM, HAV genotype)	
Hepatitis B virus (HBsAg, HBeAg, anti-HBc IgM, HBV NAAT, HBV genotype; report all HBsAg and anti-HBs (positive, negative, indeterminate) for children ≤ 5 years of age) (6)	
Hepatitis C virus (all HCV test results including positive and negative antibody, RNA, and genotype tests) (6)	
Histoplasma capsulatum (Histoplasmosis)	
HIV tests including: reactive immunoassays including all analytes (e.g., Ab/Ag, TD1/TD2, WB, EIA, IA), detection tests (e.g., VL, NAAT, p24, genotypes), CD4 counts/percentages; and all tests related to perinatal exposures) (2,6)	
Influenza virus (weekly aggregate counts)	
Pediatric influenza mortality, report individual cases (5)	
Novel influenza viruses, report individual cases (5, 6)	
Kawasaki Disease (1)	

LEGEND

- (1) Reporting within 3 days is required.
 - (2) Report HIV labs electronically/by arrangement & case reports by MDHHS Form 1355. Report HIV genome sequence data only as Sanger sequences, or as consensus sequences for next generation sequencing.
 - (3) Sexually transmitted infection for which expedited partner therapy is authorized. See www.michigan.gov/hivsti for details.
 - (4) A laboratory shall immediately submit suspect or confirmed isolates, subcultures, or specimens from the patient being tested to the MDHHS Lansing laboratory.
 - (5) Isolate requested. Enteric: if an isolate is not available from non-culture based testing, the positive broth and/or stool in transport medium must be submitted to the MDHHS Lansing laboratory. Respiratory: Submit specimens, if available.
 - (6) Report pregnancy status, if available.
- Blue Bold Text = Category A Bioterrorism or Select Agent must be notified immediately to the MDHHS Laboratory (517-335-8063)

This reporting is expressly allowed under HIPAA and required by Michigan Public Act 368 of 1976, 333.5111
MDHHS maintains, reviews, and revises this list at least annually, for the most recent version please refer to: www.michigan.gov/cdinfo
Michigan Department of Health and Human Services • Bureau of Laboratories • Bureau of Infectious Disease Prevention

Infection Prevention Recommendations



Transmission-based Precautions	Hand Hygiene	Environmental Cleaning & Disinfection	Communication of MDRO Status
<ul style="list-style-type: none"> • ACH, LTAC, IRF – Contact Precautions, single room • vSNF & SNF – Enhanced Barrier Precautions or Contact Precautions • Cohorting may be possible • Disposable or dedicated equipment, when possible 	<ul style="list-style-type: none"> • Standard hand hygiene practices • ABHS preferred in most clinical situations 	<ul style="list-style-type: none"> • Use an EPA-registered hospital-grade disinfectant effective against <i>C. auris</i> – LIST P • Daily, terminal, shared equipment 	<ul style="list-style-type: none"> • Implement effective verbal and written communication strategies during transfers • Inter- and Intra-facility communication forms

Thank You for Your Partnership!

Surveillance for Healthcare Associated and Resistant Pathogens (SHARP) Unit
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