HAI High Sign Special Edition

Candida auris

News from the Virginia Department of Health

Healthcare-Associated Infections and Antimicrobial Resistance Program

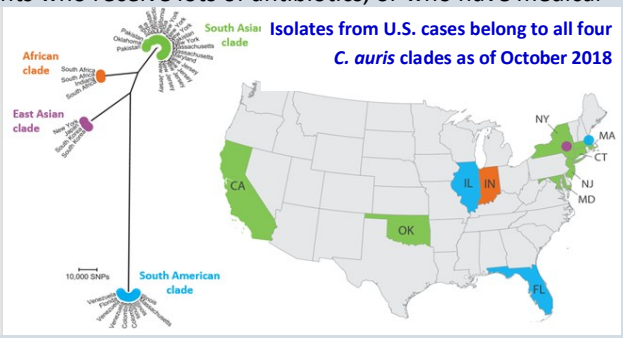
In this issue:

Description of *Candida auris*

Candida auris (*C. auris*) is a type of yeast, first described in 2009, causing a serious global threat due to the increasing occurrence of patients infected or colonized with this difficult to treat and difficult to control organism.

C. auris can cause bloodstream and other types of invasive infections, particularly in patients in hospitals and settings where patients have multiple medical problems. It is more likely to affect immunocompromised patients, patients who receive lots of antibiotics, or who have medical devices.

The CDC has used whole-genome sequencing to better understand the DNA fingerprint of *C. auris.* The analysis revealed there are four different *C. auris* strains or clades. In the United States, most *C. auris* infections are related to strains from South Asia, but others have been linked to strains from South America and East Asia.

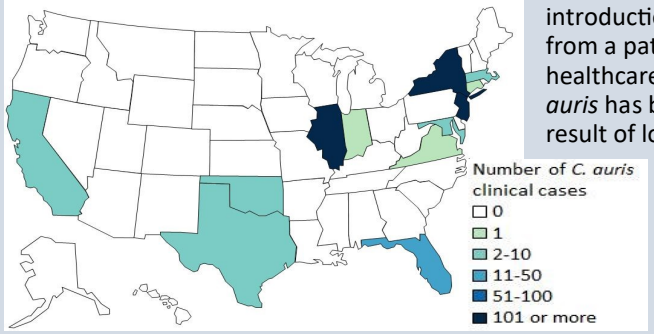


First Case Reported in Virginia

The first known *C. auris* case in Virginia was reported in October 2018. Investigations elucidated that the sample was collected in an outpatient clinic and the index case did not have any significant comorbidities or travel history except for history of colonization by another multidrug-resistant organism. The VDH containment strategy included rapid identification of high risk contacts, broad colonization screening, infection control assessment, environmental disinfection and prospective surveillance. The investigation did not determine the acquisition origin, however, a possible risk factor involved the index-case working at a place where there was close contact with individuals requiring a higher level of medical care. No other cases have been identified to date.

Cases in the U.S. and Case Definition

U.S. Map: Clinical cases of *Candida auris* reported by U.S. states, as of March 31, 2019



United States *C. auris* cases are a result of either: 1) inadvertent introduction of *C. auris* into the U.S. from a patient who recently received healthcare in a country where *C. auris* has been reported or, 2) a result of local spread after such an introduction.

CDC updates case counts monthly. This information can be found **here**.

Table 1. Case definitions for *C. auris* established by the Council of State and Territorial Epidemiologists

	Confirmed	Probable	Suspect
Clinical Case	Confirmatory laboratory evidence from invasive or non-invasive clinical specimens.	Person with supportive laboratory evidence and evidence of epidemiologic linkage.*	Person with supportive laboratory evidence and no evidence of epidemiologic linkage.
Colonization/ Screening	Confirmatory laboratory evidence from a swab collected for the purpose of screening for *C. auris* colonization regardless of site swabbed.	Person with supportive laboratory evidence from a swab collected for the purpose of screening for *C. auris* colonization.	N/A

*For example, if a patient has *Candida haemulonii* isolated from a clinical sample (urine) while the patient is admitted to the same healthcare facility where a confirmed case of *C. auris* has been identified, this is considered a probable case.

Concerns with *C. auris*

1. *C. auris* isolates are often multidrug-resistant

First Pan-Resistant *C. auris* case identified in the U.S.

- Case was identified January 2019
- Isolate was resistant to all available antifungals
- A new antifungal undergoing Phase 2 trials for invasive aspergillosis and invasive candidiasis, APX001A, is showing potent activity against isolates that are azole and/or echinocandin resistant
- APX001A works by inhibiting the Glycosylphosphatidylinositol (GPI) glycolipid biosynthesis pathway
- More information about the *in vitro* susceptibilities of APX001A can be found here.

In the U.S., isolates have shown the following resistance:

90%	30%	5%
Fluconazole resistance	Amphotericin B resistance	Echinocandin resistance

The *in vitro* susceptibility of *C. auris* isolates to antifungal drugs is variable and can depend on the clade. Isolates from the South Asian clade (primarily in NY and NJ) were resistant to fluconazole (93%), amphotericin B (40%), and echinocandins (3%). However, *C. auris* isolates in the U.S. belonging to the South American clade (primarily in the Chicago area) have been susceptible to all antifungals to date.

There are currently no established *C. auris*-specific susceptibility breakpoints. Therefore, breakpoints are defined based on those established for closely related Candida species and on expert opinion. More information regarding CDC tentative antifungal breakpoints can be found here.

2. *C. auris* is difficult to identify

- *C. auris* can be misidentified as a number of different organisms when using traditional phenotypic methods for yeast identification.
- CDC has developed updated recommendations for healthcare facilities and laboratories about the identification of *C. auris* that are available here.
- Correct identification of *C. auris* is possible using the Bruker MALDI-TOF commercial instruments with *C. auris* present in the reference profile database, or by DNA sequencing.

Table 2. Summary of common misidentifications based on the identification method used (CDC). These isolates should be forwarded to DCLS for confirmatory testing.

Identification Method	Organism *C. auris* can be misidentified as
bioMérieux Vitek MS MALDI-TOF	*Candida haemulonii*
Vitek 2 YST*	*Candida haemulonii* *Candida duobushaemulonii*
API 20C	*Candida sake* *Rhodotorula glutinis* (characteristic red color not present)
BD Phoenix yeast identification system	*Candida haemulonii* *Candida catenulata*
MicroScan	*Candida parapsilosis* *Candida famata* *Candida guilliermondii* *Candida lusitaniae*
RapID Yeast Plus	*Candida parapsilosis*

*Vitek 2 software version 8.01 contains identification algorithms for *C. auris*; however, misidentification has been reported for some clades (e.g., African and East Asian). It is recommended to send isolates to DCLS for identification/confirmation until more data are available.

3. *C. auris* can be easily transmitted from person-to-person

CDC gold-standard laboratories have analyzed hundreds of international *C. auris* samples. *C. auris* samples were found to be nearly identical within each hospital, suggesting that *C. auris* spreads in healthcare settings. *C. auris* can persist on surfaces in healthcare environments. Quaternary ammonia products used for routine healthcare setting disinfection may not be effective against *C. auris.* For more information, see page 5.

Reporting Requirements

The State Board of Health updated the Virginia Regulations for Disease Reporting and Control (12 VAC 5-90-80) effective November 14, 2018. *C. auris* was added to the reportable disease list and conditions reportable by directors of laboratories. For more information on the reportable disease regulations and reporting *C. auris*, please visit the **VDH interpretive guidance for *C. auris* reporting.**

Virginia Reportable Disease	Virginia Isolate Submission
Report suspected or confirmed *C. auris*, infection or colonization, to your local health department.	Submit the following: All confirmed *C. auris* and *C. haemulonii* isolates from any specimen source; OR Yeast isolates from any specimen source when unable to identify species after identification is attempted per laboratory policies; OR Suspected *C. auris* isolates from any specimen source (**Table 2 on page 2**).

How do we stop the spread of *C. auris*?

VDH recommends following the Containment Strategy

Goal

- Slow spread of novel or rare multidrug-resistant organisms or mechanisms

Response

- Systematic, aggressive response to a SINGLE case of high concern of antimicrobial resistance

Approach

- Response activities are tiered based on organism/mechanism attributes

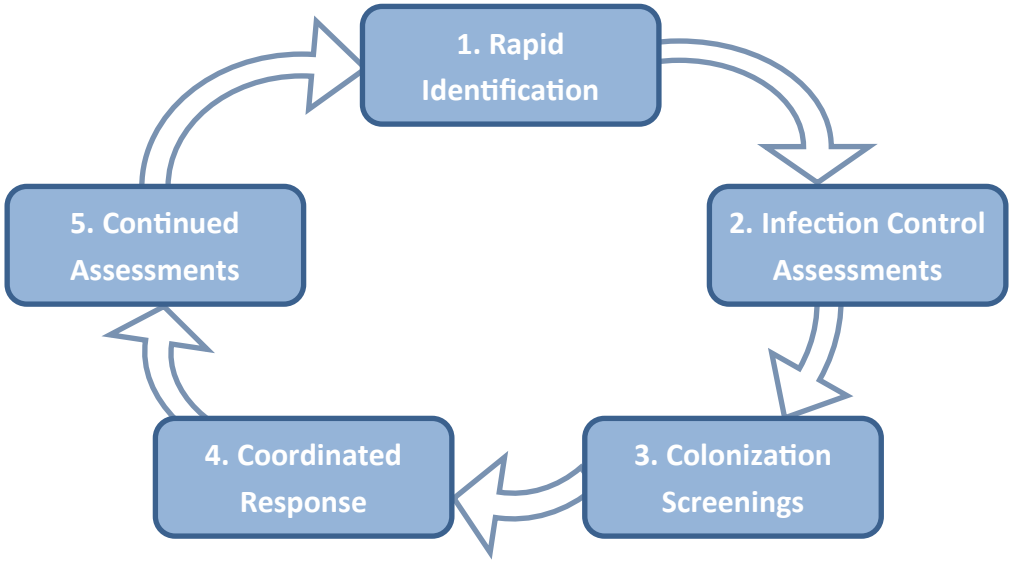
CDC Multidrug-Resistant Organism (MDRO) Tiers

Tier 1	Tier 2	Tier 3
CDC Definition • Resistance mechanisms novel to the U.S. • Organisms for which no current treatment options exist (pan-resistant)	**CDC Definition** • MDROs primarily found in healthcare settings but not found regularly in the region; Organisms might be found more commonly in other areas in the U.S.	**CDC Definition** • MDROs that are already established in the U.S. and have been identified before in the region but are not thought to be endemic
In Virginia: • Pan-resistant *C. auris* isolates	**In Virginia:** • *C. auris*	**In Virginia:** • Not applicable for *C. auris*

The Containment Strategy for *C. auris*

Containment Strategy in Practice for *C. auris*

The Containment Strategy includes five elements:

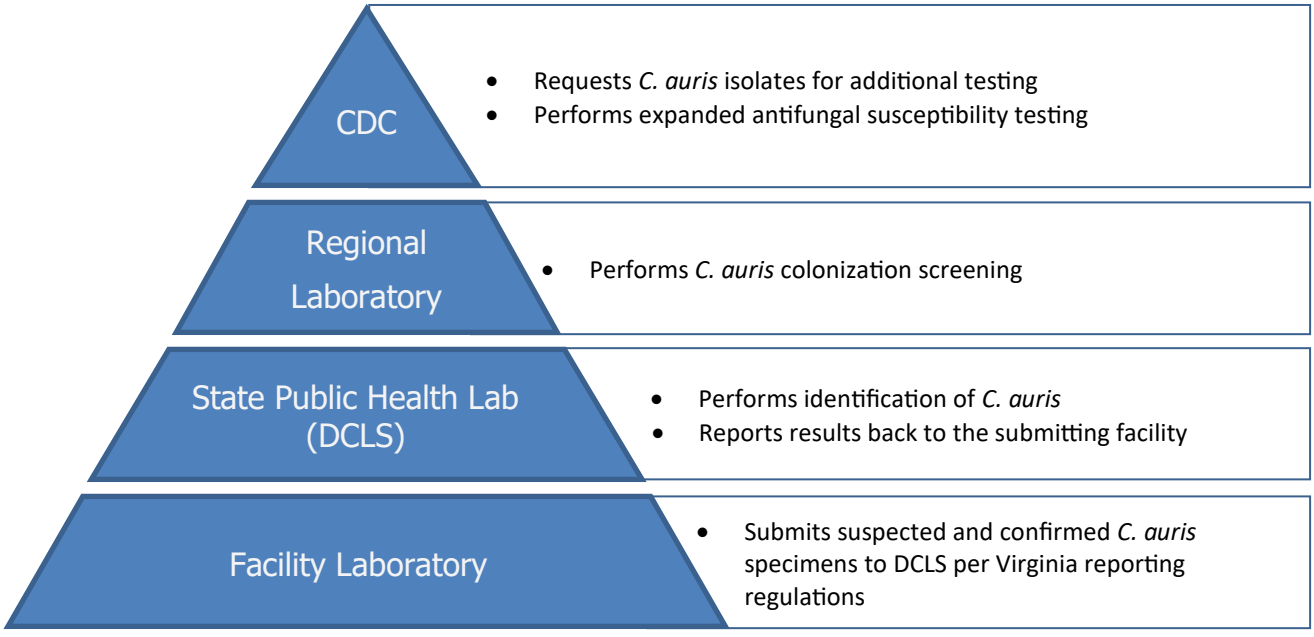


1. Rapid Identification

The CDC established the Antibiotic Resistance Lab Network, or ARLN, in 2016 to:

- Rapidly detect antibiotic resistance (AR) in healthcare and the community
- Provide comprehensive lab capacity and infrastructure for AR pathogens
- Prevent spread of future AR threats

The AR Lab Network includes labs in 50 states, five cities, Puerto Rico, and seven regional labs.



See the VDH interpretive guidance for *C. auris* reporting for more guidance on DCLS testing.

2. Infection Prevention Assessments

Transmission-Based Precautions

Infection Prevention is an important strategy to stop the transmission of *C. auris*. This involves transmission-based precautions, choosing the right environmental cleaning product, and monitoring staff compliance with infection prevention practices. For more information, please visit the **CDC webpage on infection prevention and control for *C. auris***.

Table 3: Facility infection prevention policies for *C. auris*

Infection Prevention	Acute Care Facility		Long-Term Care Setting	
	Infected	Colonized	Infected	Colonized
Standard Precautions	Yes	Yes	Yes	Yes
Contact Precautions	Yes	Yes	Yes	Yes, if high risk for transmission*
Private Room	Yes	Yes	Yes	Yes, if feasible
Door signage	Yes	Yes	Yes	Yes
Designated or disposable equipment	Yes	Yes	Yes	Yes
Visitor Recommendations				
Perform hand hygiene often, and always after leaving resident's room	Yes	Yes	Yes	Yes
Wear gown/gloves if contact with body fluids is anticipated	Yes	Yes	Yes	Yes
Wear gown/gloves if no contact with body fluids is anticipated	No	No	No	No

*Unable to perform hand hygiene, ventilator-dependent, incontinent of stool or urine, dependent on staff for activities of daily living (ADLs), draining wounds.

Environmental Cleaning

Because *C. auris* can persist on surfaces in the healthcare environment, the CDC recommends use of an Environmental Protection Agency (EPA) - registered hospital grade disinfectant from **List K**.

In addition, be mindful to follow all manufacturer directions for use of the surface disinfectant, including the proper product application amount and contact time.

When use of products on List K is not feasible, published research found that the following products led to a substantial reduction (≥4 log reduction) of *C. auris* in laboratory testing (**Cadnum et al., 2018**; **Rutala, et al., 2017**):

- Oxivir Tb
- Clorox Healthcare Hydrogen Peroxide Cleaner Disinfectant
- Prime Sani-Cloth Wipe
- Super Sani-Cloth Wipe

Assessments

Infection Prevention assessments should be completed by the facility on a regular basis to help identify and correct any gaps.

When *C. auris* is identified in a facility the CDC recommends:	Health departments or other experts should conduct on-site visits at facilities that have cared for the index patient and use a standardized assessment tool to evaluate infection control practices.

VDH uses the **CDC Infection Control Assessment Tools** when conducting on-site visits.

2. Infection Control Assessments (continued)

Duration of Contact Precautions

Information is limited on the duration of *C. auris* colonization; however, evidence suggests that patients remain colonized for many months, perhaps indefinitely.

Periodic reassessments could help inform duration of infection control measures. Prior to an assessment, the patient should be off antifungal medications for at least a week. *C. auris* colonization assessments involve testing swabs of the axilla and groin and sites yielding *C. auris* on previous cultures.

- If a patient's swab is positive, there is no need to repeat sampling for at least another three months.
- If a patient's swab is negative, then at least one more assessment at least one week later is needed before discontinuing *C. auris* specific-infection control precautions.

For more information about the duration of contact isolation and periodic reassessment please **click here**.

3. Colonization Screenings

Screening is when samples are collected from patients that do not have an infection that is caused by *C. auris* to determine whether or not they are carrying that organism somewhere on their bodies. Targeted screening should be conducted as part of an effort to control the spread of *C. auris*. Collecting a composite swab of both axilla and groin is typically recommended because approximately 90% of colonized people have been identified by swabbing the axilla or the groin.

C. auris Admission Screening

Healthcare facilities should give consideration to screen high-risk patients for *C. auris* on admission.

Purpose

To detect patients not previously known to be colonized, leading to earlier implementation of infection prevention precautions and potentially limiting spread.

High-risk Patient Population

Consider *C. auris* admission screening for the following patients (listed in order of highest priority):

1. Patients who have had an overnight stay in a healthcare facility outside the U.S. in the previous year AND have infection or colonization with carbapenemase producing gram-negative bacteria.
2. Patients who have had an overnight stay in a healthcare facility outside the U.S. in the previous year in a country with documented *C. auris* cases.
3. Patients transferred from high-risk facilities (long-term acute care hospitals or ventilator units of skilled nursing facilities) known to have high prevalence of *C. auris* or transferred from regions in the U.S. with a high prevalence of *C. auris*.
4. Patients who have had an overnight stay in a healthcare facility outside the U.S.

Patients should be placed on presumptive contact precautions while awaiting results.

If admission screening for high-risk patients cannot be performed, facilities should follow *C. auris* specific-infection control precautions for their entire stay.

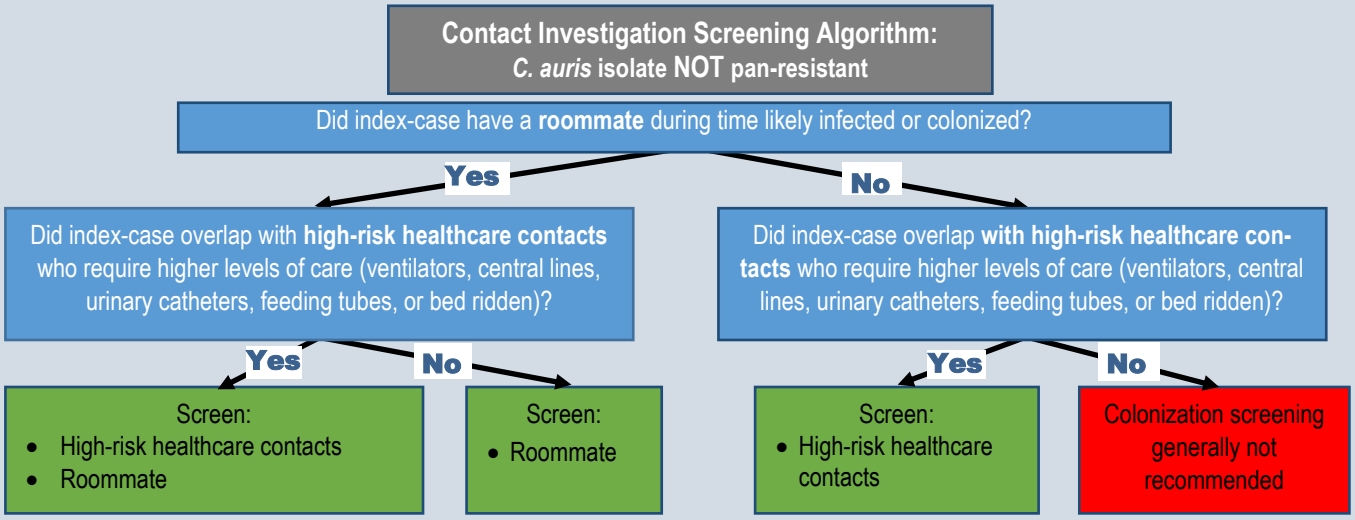
Performing Admission Screening

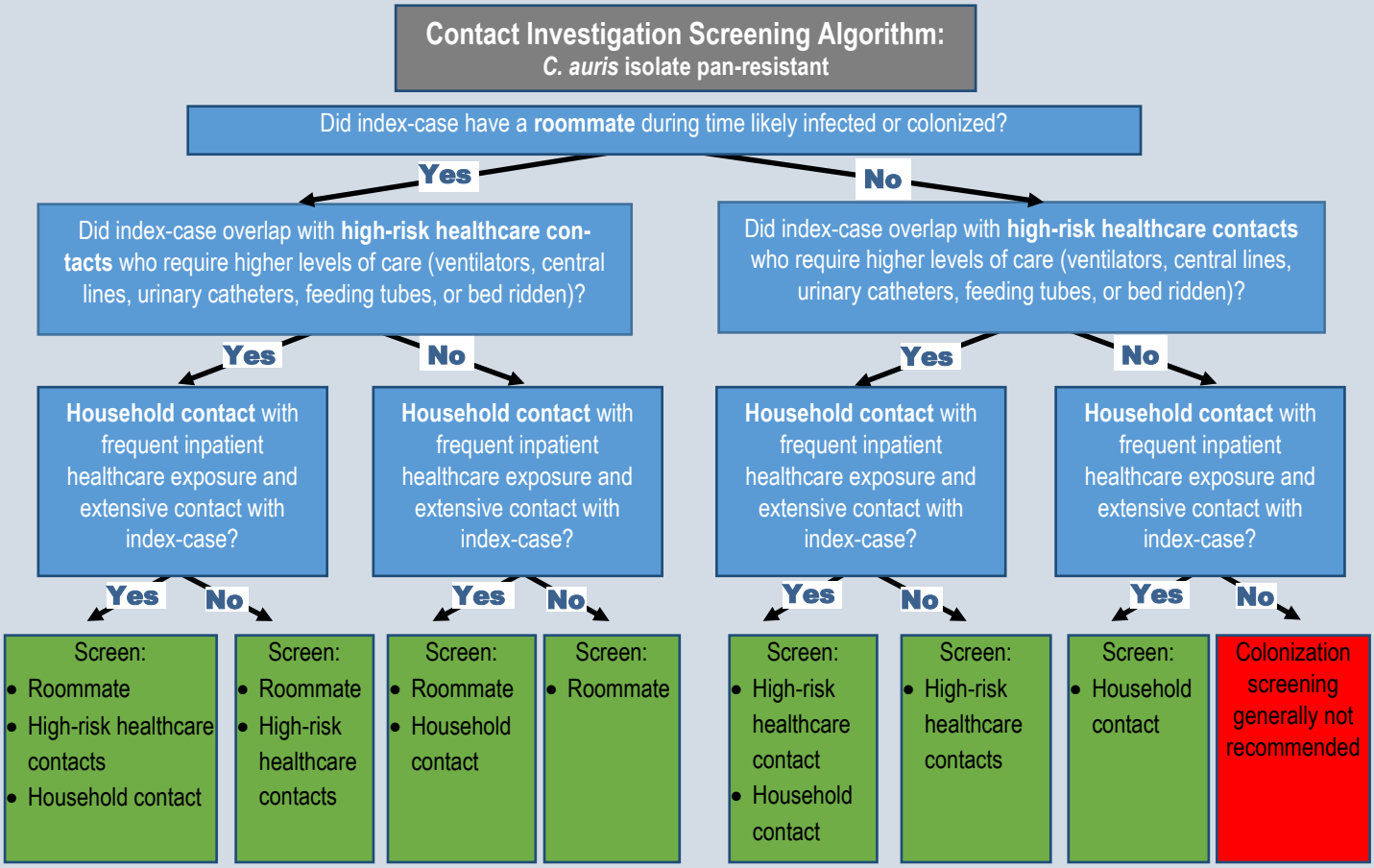
Testing is available free-of-charge Monday through Friday at the CDC Mid-Atlantic AR Laboratory Network. Due to the short shelf life of collected specimens, current laboratory capacity, and turn-around-time for results, coordination must occur between the facility and public health laboratory for successful screenings to occur. If your facility is interested in performing admission screening, contact your local health department to arrange for testing.

3. Colonization Screenings (continued)

C. auris Contact Investigation Screening

When *C. auris* is identified in a facility, **the facility should work with the local health department to identify patients who should be screened**. This is available through the AR Laboratory Network at no charge to the patient or facility.





Wider surveys extending beyond roommates and high risk healthcare contacts are clearly indicated if there is evidence or suspicion of ongoing transmission (e.g., isolates from multiple patients) or if initial targeted screening of high-risk patients identifies new cases.

Screening activities should be coordinated through public health departments and their laboratories. Once specimens are collected, they have a shelf life of four (4) days.

4. Coordinated Response Between Facilities

C. auris can spread rapidly to other facilities. Infection prevention information should be transferred **with the patient at the time of transfer** to ensure the accepting facility is implementing the correct measures. **The** CDC Interfacility Infection Control Transfer Form can be used if no other form is currently being used at the facility.

5. Continued Assessments and Screenings

Once *C. auris* is detected in a facility, be on high alert for transmission. Remind the laboratory to continue to send suspect or confirmed *C. auris* isolates to DCLS for confirmatory testing. Continue to work with your local health department on enhanced surveillance and response.

CDC Containment Strategy Recommendation Summary

	Pan-resistant *C. auris*	Non pan-resistant *C. auris*
Healthcare investigation	Always	Always
Prospective lab surveillance	Always	Always
Retrospective lab surveillance	Always	Always
Onsite Infection Control Assessment with observations of practices	Always	Always
Screening of healthcare roommates	Always	Always
Broader screening of healthcare contacts	Always	Always
Household contact screening	Sometimes	Rarely
Environmental sampling	Rarely	Rarely
Healthcare personnel screening	Rarely	Rarely

More Detailed Guidance

CDC MDRO Toolkit

CDC *C. auris* Webpage

Healthcare-Associated Infections (HAI) and Antimicrobial Resistance (AR) Program

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