



Global Emergence of Invasive Infections Caused by the Multidrug-Resistant Yeast, *Candida auris*

Clinical Alert to Healthcare Facilities

Date: June 29, 2016

Intended Audience: All public health partners Healthcare providers Infection preventionists
 Local health departments Schools/child care centers ACOs
 Animal health professionals Other: **Laboratories**

Key Points or Updates:

- (1) *Candida auris* is an emerging multidrug-resistant yeast that causes invasive healthcare-associated infections with high rates of mortality, and has been found in nine countries since 2009, including one isolate of *Candida auris* was found in the United States in 2013.

Action Items:

- (1) Healthcare facilities that suspect they have a patient with *Candida auris* should contact the Antimicrobial Resistance Coordinator at the New Jersey Department of Health.
- (2) Laboratories identifying *Candida auris* isolates in the United States should notify the Antimicrobial Resistance Coordinator at the New Jersey Department of Health.
- (3) Any patients with *Candida auris* infections or colonization should be placed on standard and contact precautions, including placement in a single room. Facilities should complete daily and terminal cleaning and disinfection of the patient's room using EPA-registered hospital grade disinfectant with a fungal claim.

Contact Information:

- Patricia M. Barrett, Antimicrobial Resistance Coordinator, at patricia.barrett@doh.nj.gov or (609) 826-5964;
- Rebecca Greeley, Infectious Disease Team Lead, at Rebecca.greeley@doh.nj.gov of (609) 826-5964; or
- The Communicable Disease Service at (609) 826-5964 during business hours

References and Resources:

- Clinical Alert to U.S. Healthcare Facilities: Global Emergence of Invasive Infections Caused by the Multidrug-Resistant Yeast *Candida auris* (2016). Document attached. Available at: <http://www.cdc.gov/fungal/diseases/candidiasis/candida-auris-alert.html>
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Clinical Alert to U.S. Healthcare Facilities

Global Emergence of Invasive Infections Caused by the Multidrug-Resistant Yeast *Candida auris*

Summary: The Centers for Disease Control and Prevention (CDC) has received reports from international healthcare facilities that *Candida auris*, an emerging multidrug-resistant (MDR) yeast, is causing invasive healthcare-associated infections with high mortality. Some strains of *C. auris* have elevated minimum inhibitory concentrations (MICs) to the three major classes of antifungals, severely limiting treatment options. *C. auris* requires specialized methods for identification and could be misidentified as another yeast when relying on traditional biochemical methods. CDC is aware of one isolate of *C. auris* that was detected in the United States in 2013 as part of ongoing surveillance. Experience outside the United States suggests that *C. auris* has high potential to cause outbreaks in healthcare facilities. Given the occurrence of *C. auris* in nine countries on four continents since 2009, CDC is alerting U.S. healthcare facilities to be on the lookout for *C. auris* in patients.

Background

Candida auris is an emerging multidrug-resistant (MDR) yeast that can cause invasive infections and is associated with high mortality. It was first described in 2009 after being isolated from external ear discharge of a patient in Japan¹. Since the 2009 report, *C. auris* infections, specifically fungemia, have been reported from South Korea², India³, South Africa⁴, and Kuwait⁵. Although published reports are not available, *C. auris* has also been identified in Colombia, Venezuela, Pakistan, and the United Kingdom.

It is unknown why *C. auris* has recently emerged in so many different locations. Molecular typing of strains performed by CDC suggests isolates are highly related within a country or region but highly distinct between continents⁶. The earliest known infection with *C. auris*, based on retrospective testing of isolate collections, occurred in South Korea in 1996². *C. auris* may not represent a new organism so much as one that is newly emerging in various clinical settings. Although the causes for such emergence are unknown, they may include new or increasing antifungal selection pressures in humans, animals, or the environment.

C. auris infections have most commonly been hospital-acquired and occurred several weeks into a patient's hospital stay. *C. auris* has been reported to cause bloodstream infections, wound infections, and otitis². It has also been cultured from urine and the respiratory tract; however, whether isolation from these sites represented infection versus colonization in each instance is unknown. *C. auris* has been documented to cause infections in patients of all ages. Patients were found to have similar risk factors for infections with other *Candida* spp.^{6,7}, including: diabetes mellitus, recent surgery, recent antibiotics, and presence of central venous catheters³. Co-infection with other *Candida* spp. and detection of *C. auris* while the patient was being treated with antifungals have also been reported².

Although no established minimum inhibitory concentration (MIC) breakpoints exist for *C. auris*, resistance testing

of an international collection of isolates conducted by CDC demonstrated that nearly all isolates are highly resistant to fluconazole based on breakpoints established for other *Candida* spp. More than half of *C. auris* isolates were resistant to voriconazole, one-third were resistant to amphotericin B (MIC ≥ 2), and a few were resistant to echinocandins. Some isolates have demonstrated elevated MICs to all three major antifungal classes, including azoles, echinocandins, and polyenes, indicating that treatment options would be limited.

C. auris phenotypically resembles *Candida haemulonii*¹. Commercially available biochemical-based tests, including API strips and VITEK-2, used in many U.S. laboratories to identify fungi, cannot differentiate *C. auris* from related species. Because of these challenges, clinical laboratories have misidentified the organism as *C. haemulonii* and *Saccharomyces cerevisiae*. Some clinical laboratories do not fully identify all *Candida* to the species level, and *C. auris* isolates have been reported as “other *Candida* spp.” Clinical, state, and public health laboratories should be aware of this organism and of the limitations in its identification.

At least two countries have described healthcare outbreaks of *C. auris* infection and colonization involving more than 30 patients each. Analysis of isolates from these clusters demonstrate a high degree of clonality within the same hospital, supporting the idea that the organisms are being transmitted within those healthcare facilities. The precise mode of transmission within the healthcare facility is not known. However, experience during these outbreaks suggests that *C. auris* might contaminate the environment of rooms of colonized or infected patients. Good infection control practices and environmental cleaning may help prevent transmission.

Interim Recommendations

CDC is concerned that *C. auris* will emerge in new locations, including the United States. CDC and partners continue to work closely, and new information will be provided as it becomes available. CDC recommends the following actions for U.S. healthcare facilities and laboratories:

- **Reporting** — Healthcare facilities who suspect they have a patient with *C. auris* infection should contact state/local public health authorities and CDC (candidaauris@cdc.gov (<mailto:candidaauris@cdc.gov>)).
- **Laboratory Diagnosis** — Diagnostic devices based on matrix-assisted laser desorption/ionization-time of flight (MALDI-TOF) can differentiate *C. auris*, but not all devices currently include *C. auris* in the reference database to allow for detection. Molecular methods based on sequencing the D1-D2 region of the 28S rDNA can also identify *C. auris*. CDC requests that laboratories identifying *C. auris* isolates in the United States notify their state or local health departments and CDC (candidaauris@cdc.gov (<mailto:candidaauris@cdc.gov>)). *C. haemulonii* isolates and other isolates from clinical specimens that cannot be identified beyond *Candida* spp. by conventional methods can be forwarded through state public health laboratories to CDC for further characterization.
- **Infection Control** — Until further information is available, healthcare facilities should place patients with *C. auris* colonization or infection in single rooms and healthcare personnel should use Standard and Contact Precautions. In addition, state or local health authorities and CDC should be consulted about the need for additional interventions to prevent transmission. CDC is working with domestic and international partners to develop definitive infection control guidance.
- **Environmental Cleaning** — Anecdotal reports have suggested that *C. auris* may persist in the environment. Healthcare facilities who have patients with *C. auris* infection or colonization should ensure thorough daily and terminal cleaning and disinfection of these patient’s rooms using an EPA-registered hospital grade disinfectant with a fungal claim.

For more information:

1. Satoh, K., et al., *Candida auris* sp. nov., a novel ascomycetous yeast isolated from the external ear canal of an inpatient in a Japanese hospital. *Microbiol Immunol*, 2009. 53(1): p. 41-4.
 2. Lee, W.G., et al., First three reported cases of nosocomial fungemia caused by *Candida auris*. *J Clin Microbiol*, 2011. 49(9): p. 3139-42.
 3. Chowdhary, A., et al., New clonal strain of *Candida auris*, Delhi, India. *Emerg Infect Dis*, 2013. 19(10): p. 1670-3.
 4. Magobo, R.E., et al., *Candida auris*-associated candidemia, South Africa. *Emerg Infect Dis*, 2014. 20(7): p. 1250-1.
 5. Emara, M., et al., *Candida auris* candidemia in Kuwait, 2014. *Emerg Infect Dis*, 2015. 21(6): p. 1091-2.
 6. Ben-Ami, R., et al., Antibiotic exposure as a risk factor for fluconazole-resistant *Candida* bloodstream infection. *Antimicrob Agents Chemother*, 2012. 56(5): p. 2518-23.
 7. Wey, S.B., et al., Risk factors for hospital-acquired candidemia. A matched case-control study. *Arch Intern Med*, 1989. 149(10): p. 2349-53.
 8. Laboratory Submission Information: http://www.cdc.gov/fungal/lab_submission.html
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National Center for Emerging and Zoonotic Infectious Diseases (NCEZID) (/ncezid/)

Division of Foodborne, Waterborne, and Environmental Diseases (DFWED) (/ncezid/dfwed/index.html)