



Multi-Drug Resistant *Candida auris*

Abstract

Candida auris is an emerging multi-drug resistant yeast that poses a global health threat. Known for causing serious and sometimes fatal fungal infections in hospitalized patients, this yeast does not respond to commonly used antifungal drugs, making infections difficult to treat. Furthermore, *C. auris* is difficult to identify with standard laboratory methods, as such it can be misidentified in labs without specific technology. For these reasons effective infection prevention measures, including disinfection of environmental surfaces, are an essential aspect in the prevention and control of this emerging pathogen. Currently the CDC recommends the use of a sporicidal agent to be used in suspected or confirmed cases of *C. auris*. However, leveraging Spaulding's Hierarchy of Susceptibility, our position is that when used according to label directions, disinfectants with proven efficacy against fungi, such as those based on Accelerated Hydrogen Peroxide®, will be effective against this emerging pathogen.

Background

C. auris was first identified in 2009 after being isolated from external ear discharge of a patient in Japan. Since the 2009 report, *C. auris* infections have been reported from over a dozen countries, including Canada, Colombia, Germany, India, Israel, Japan, Kenya, Kuwait, Norway, Pakistan, Spain, South Africa, South Korea, the United Kingdom, Venezuela, as well as the United States. Because identification of *C. auris* requires specialized laboratory methods, infections likely have occurred in other countries but have not been identified or reported.

Symptoms and Treatment

C. auris infections have most commonly been hospital-associated and occurred several weeks into a patient's hospital stay. *C. auris* has been reported to cause bloodstream infections, wound infections, and otitis (ear infection). 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. including: diabetes mellitus, recent surgery, recent antibiotic use, and presence of central venous catheters. Co-infection with other *Candida* spp. and detection of *C. auris* while the patient was being treated with anti-fungals has also been reported. Most *C. auris* infections are treatable with a class of anti-fungal drugs called echinocandins. However, some *C. auris* infections have been resistant to all three main classes of anti-fungal medications, making them more

difficult to treat. In this situation, multiple classes of anti-fungals at high doses may be required to treat the infection.

Transmission

As an emerging pathogen, the epidemiology of transmission for *C. auris* is still under investigation. Early evidence suggests that the organism is spread in healthcare settings through contact with contaminated environmental surfaces or equipment, or from person to person. However, more research is required to understand how *C. auris* spreads. It is unlikely that routine travel to countries with documented *C. auris* infections would increase the chance of someone becoming ill from *C. auris*, as infections have occurred primarily in patients who are admitted to the hospital for other reasons.

Control Measures

In acute care settings, patients should be placed in single rooms on Standard (Routine) and Contact Precautions. Highly functional nursing home residents without wounds or indwelling medical devices (e.g., urinary and intravenous catheters and gastrostomy tubes) who can perform hand hygiene might be at lower risk of transmitting *C. auris*. Facilities may consider relaxing the requirement for Contact Precautions for these residents. However, in these instances, healthcare personnel should still use gowns and gloves when performing tasks that put them at higher risk of contaminating their hands or clothing. These tasks include changing wound dressings and linens and assisting with bathing, toileting, and dressing in the morning and evening. When patients are transferred to other healthcare facilities, receiving facilities should receive notification of *C. auris* infection or colonization and the level of precautions recommended.

Cleaning and Disinfection

C. auris appears to be able to persist on surfaces in healthcare environments. Further work is needed to determine how long the organism would be viable. Currently, the Environmental Protection Agency (EPA) who is responsible for regulating hospital disinfectants and other antimicrobial pesticides used in healthcare has acknowledged that there are no EPA-registered hospital disinfectants with specific claims for treating environmental surfaces contaminated with *C. auris*. Thus, the EPA has issued interim regulatory guidance and recommended methodology for evaluating the effectiveness of hospital disinfectants against *C. auris*. If disinfectant manufacturers can meet the specific testing requirements set forth by the EPA we may see disinfectants with a specific claim against *C. auris* in the future. In the meantime, the CDC recommends the use of EPA registered hospital

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disinfectants with efficacy against *Clostridium difficile* spores in areas where *C. auris* has been identified or suspected.

For areas where *C. auris* is not suspected or confirmed, healthcare facilities should use EPA registered disinfectants containing the characteristics of an ideal disinfectant. An ideal disinfectant will have a broad spectrum of germicidal efficacy (including efficacy against fungi and yeasts), proven cleaning capabilities, fast contact times, will be non-toxic and non-irritating to users, and will be environmentally preferred. Disinfectants that meet these requirements increase user compliance which contribute to the prevention of pathogen transmission.

Conclusions

Given the severity of *C. auris* infection, limited treatment options, persistence on environmental surfaces, and high potential to cause outbreaks, healthcare facilities are advised to be on the lookout for *C. auris* and implement effective infection prevention measures. Until disinfectant manufacturers undergo efficacy testing for *C. auris*, healthcare facilities with confirmed or suspected cases of *C. auris* are recommended to use disinfectants with sporicidal activity. For all other areas, EPA registered disinfectants that contain the properties of an ideal disinfectant should be used, especially on high touch environmental surfaces.

Implications for AHP®

While the current cleaning and disinfection recommendation for suspected or confirmed cases of *C. auris* is the use of a sporicidal agent, according to Spaulding's Hierarchy of Susceptibility, the use of a disinfectant with proven efficacy against fungi should be the proposed recommendation. According to Spaulding, *Candida* species are easier to kill compared to non-enveloped viruses and mycobacteria. If a disinfectant has a broad spectrum of germicidal efficacy, including claims against fungi, efficacy against *C. auris* would be expected provided that label directions for use are adhered to.

AHP® is a globally patented disinfectant technology with all the characteristics of an ideal disinfectant. While there is currently no EPA approved test method to test against *C. auris*, all AHP® formulations carry a broad spectrum of germicidal efficacy including claims against non-enveloped viruses, mycobacteria and fungi such as *Candida albicans*, *Microsporum canis*, and *Trichophyton mentagrophytes*. In fact, at the 2017 National APIC Conference, Dr. Rutala presented results from a 2017 study that showed how AHP® provides a $\geq 3 \log_{10}$ reduction

against *C. auris*°. AHP® utilizes superior surfactants that efficiently remove fungal spores and has been proven to prevent cross contamination to secondary surfaces°. Furthermore, AHP® has been proven to reduce HAI's, including multi-drug resistant pathogens including VRE, MRSA, and *C. difficile* by $\geq 20\%$ °. It is with this evidence that we expect AHP® to be efficacious against *C. auris*.

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