

Effective Immobilization of *Candida auris* by SecurePortIV®

A Potential Novel Regimen to Help Conquer a Global Health Threat Posed by the Multidrug-Resistant Pathogen, Candida auris.

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OBJECTIVE AND BACKGROUND

The objective of this white paper is to demonstrate the evidence that *Candida auris* can effectively be immobilized by SecurePortIV® Catheter Securement Adhesive. SecurePortIV®, approved by the FDA in Sep. 2017, was the first and only catheter securement adhesive, which was manufactured by Adhezion Biomedical, LLC, a subsidiary of the H.B. Fuller. SecurePortIV® is intended to be a film forming securement and sealant at the point of vascular access catheter skin entry. The use of SecurePortIV® can significantly reduce various failures and complications associated with catheter insertion including dislodgement, phlebitis, infiltration, and catheter-related bloodstream infections.



As illustrated in the figure above, *Candida auris* is a dangerous bug. It is a newly emerging multidrug-resistant yeast pathogen which was first described in the ear canal of a patient in a Japanese hospital in 2009.¹ Since then, the occurrence of *Candida Auris* has notoriously caused nosocomial outbreaks in many healthcare facilities among 39 countries in six continents. People often get infections of *Candida auris* when using IV catheters. *Candida Auris* is now one of the leading causes of invasive healthcare-associated fungal infections, which has turned into a grave concern for the healthcare and scientific community and posted a huge threat to the medical field, as it resulted in a high rate of mortality among critically ill patients.²⁻⁴ In addition, *Candida auris* can spread to internal organs via bloodstream infection known as candidemia and is associated with up to 70% mortality rate.⁵⁻⁷ The centers for Disease Control and Prevention data showed that clinical cases of *Candida auris* increased from 329 in 2018 to 1,012 in 2021. In early 2023, the CDC warned that the number of patients who were found to be carrying *Candida auris* has been increasing at a dismaying speed.

Treatment and management of *Candida auris* has been challenging. *Candida auris* is resistant to various antifungal medications, can form biofilms and colonize mucous membranes and skin, and is transmissible by contact.⁸ Besides its resistance to antifungal treatments, it is also difficult to identify this pathogen from other *Candida* Species. There are currently no effective treatment options, or standardized protocols to prevent and control infections caused by *Candida Auris* in healthcare facilities. Therefore, more effective antiseptic and disinfecting agents or techniques are badly needed in order to implement hospital infection control measures for this yeast pathogen.⁹ To help overcome the notable challenge and counter-back the urgent threat of invasive infections associated with *Candida Auris*, Adhezion/H.B. Fuller herein demonstrated that SecurePortIV® is very efficient in terms of immobilizing this notorious pathogen.

RESULTS AND DISCUSSION

Experiment was designed to evaluate the supposition that SecurePortIV® immobilizes *Candida Auris* thereby prevent spread of the pathogen from the surface into the catheter need puncturing site. ¹⁰ A sterile porcine skin model was used. An incision site was made by puncturing the inoculated and treated pig skin at an acute angle using a catheter needle. The puncture site as manipulated using sterile gloves to mimic trauma to the site. The *Candida Auris* inoculated pig skin surface punctured by the catheter need without treating with SecurePortIV® was used as positive control. A sterile pig skin surface punctured with the catheter needle without inoculation of *Candida Auris* or treating with SecurePortIV® was used as negative control.

The study demonstrated that SecurePortIV® Catheter Securement Adhesive was effective in preventing migration of *Candida Auris* into a catheter needle puncture site. 99.97% of *Candida Auris* inoculated was effectively immobilized by SecurePortIV® Catheter Securement Adhesive, which equals to a 3.47 log reduction on the pathogen. SecurePortIV® Catheter Securement Adhesive was proven to be effectively immobilizing other microorganisms including Methicillin Resistant Staphylococcus Aureus (MRSA), *S. epidermidis*, *Pseudomonas aeruginosa*, *Candida albicans* and *Corynebacterium* species. It is well known that cyanoacrylate adhesives provide antibacterial and microbial barrier properties against gram-negative and gram-positive bacteria, yeast, and fungi, ¹¹⁻¹³ however, there was no previous report or publication on the antibacterial property of cyanoacrylates against *Candida Auris*.

CONCLUSION

In conclusion, SecurePortIV® Catheter Securement Adhesive was confirmed to be able to effectively immobilize *Candida Auris*, with an immobilization rate of 99.97% or a log reduction of 3.47. This is the first report on the antibacterial efficacy of cyanoacrylates against this notorious pathogen that lately becomes threatening to the global medical and health care communities. The proven antibacterial efficacy of SecurePortIV® against *Candida Auris* can help contain, inhibit and stop the spread of this drug-resistant fungus and protect vulnerable patients, particularly for those with IV catheters.

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