



CASPR

Continuous Air & Surface Pathogen Reduction (CASPR) technologies utilizes a natural catalytic process to produce non-toxic pathogen fighting oxidizers like hydrogen peroxide to continuously disinfect the air & surfaces.

The full test report is available upon request from Dakota Safety.com

EXECUTIVE SUMMARY

NICU Testing Report

RISK ASSESSMENT

The neonatal intensive care unit (NICU) contains some of the most at-risk patients for healthcare associated infections (HAIs) within the hospital. Many neonates should also be considered immunocompromised, because of immature immune systems and/or congenital defects. (1) Therefore, methods to reduce or eliminate common pathogens are critical. Microbial testing of a novel CASPR system, which stands for “continuous air and surface pathogen reduction,” technology, was conducted to assess the efficacy of this method of decontamination in NICUs.

EXECUTIVE SUMMARY OF AIR & SURFACE TESTING IN NICU PODS

This is a summary of the air and surface pathogen testing within the hospital environment. To assess the NICU environment, both air and surface testing in six NICUs in a children’s hospital was conducted, using a novel CASPR system, which stands for “continuous air and surface pathogen reduction,” technology. The study evaluated the efficacy of CASPR’s Natural Catalytic Conversion (NCC) technology in six pods of the NICU, comparing initial samples without CASPR with samples collected from air following introduction of CASPR equipment for twenty one (21) days. The average of each swab location for monthly testing was reported from measurements in CFU/cm². Outdoor air samples were collected.

Microbial Testing of Novel Technology: CASPR is a low maintenance natural catalytic converter that generates powerful oxidizers, including gaseous hydrogen peroxide (H₂O₂) from molecular oxygen and humidity of the ambient air and disburses low concentrations of oxidizers in the environment. The oxidizing molecules decompose pathogens in the air and on surfaces. The concentrations of those oxidizers are highly effective in reducing the bioburden, while safe for environments occupied by people and equipment of all kinds. CASPR is a novel technology for reducing bioburden in the air and on environmental surfaces. The technology is very low maintenance, safe, and discreet. Available units can be placed in the rooms of a Pod of a NICU to cover up to 1200 to 1500 square feet.

PRE & POST-SWAB RESULTS

Air samples collected on both March 14, 2023 and April 4, 2023 revealed trace to low spore levels that indicate healthy indoor environments that should not present health hazards due to mold or biological growth. After the CASPR devices were operational for twenty one (21) days, testing revealed that no mold spores were detected at all in NICU Pods 2, 3 and 5b. Previously this level had only been achieved in Pod 2. All spore levels found in NICU Pods 1, 4 and 5 from the air samples collected on April 4, 2023, are consistent with corresponding outside spore counts collected that day and do not present a concern.



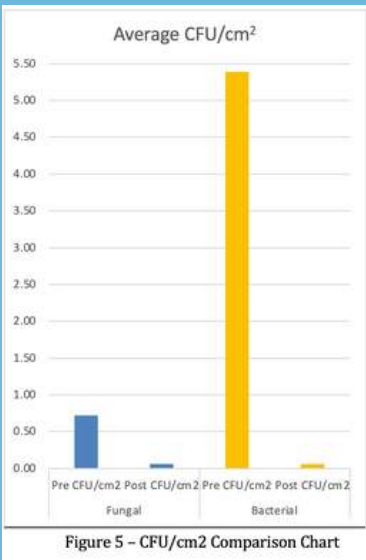
Air Sampling Table Fungal Spores: Pre and Post Installation:

| Sample Number | Sample Area | Pre-CASPR Spore Detection | Post-CASPR Observations | Post-CASPR Spore Detections |
|---------------|-------------|---|---|--|
| 1-04 | Pod 1 | Basidiospores-39 Cladosporium-76 | No visible issues | Ascospores-39 Basidiospores-115 |
| 2-04 | 2 | No visible spores | No visible issues | No Spores Detected |
| 3-04 | 3 | Basidiospores-39 Cladosporium-76 | No visible issues | No Spores Detected |
| 4-04 | 4 | No visible issues Ascospores-39 | No visible issues | Ascospores-76 Basidiospores-39 Cladosporium-39 |
| 5-04 | 5(a) | Unoccupied due to restoration, Ascospores-39 Basidiospores-76 | Reoccupied and open to 5b. No visible issues. | Cladosporium-305 Curvularia-39 |
| 6-04 | 6/5b | No visible issues Cladosporium-76 | No visible issues | No Spores Detected |
| 7-04 | Outside | Ascospores-229 Basidiospores-267 Cladosporium-115 | -- | Ascospores-39 Basidiospores-381 Cladosporium-115 |

The average for all NICU pods from post-CASPR fungal samples was 0.06 CFU/cm². The average for all NICU pods from pre-CASPR fungal samples was 0.72 CFU/cm². The comparison of the pre and post bacterial samples shows a 92.3% reduction in fungal load. This study validates prior testing of the effectiveness of the use of CASPR to reduce bioburden on environmental surfaces in the NICU pods tested.

Table 1 - Average CFU/cm² by location

| NICU POD | Sample # | Location | Fungal | | Bacterial | |
|----------|----------|----------------------|-------------------------|--------------------------|-------------------------|--------------------------|
| | | | Pre CFU/cm ² | Post CFU/cm ² | Pre CFU/cm ² | Post CFU/cm ² |
| 1 | 1-01 | Phone Handle | 5 | 1 | 26 | 0 |
| | 1-02 | Left Sink Floor | 0 | 0 | 7 | 0 |
| | 1-03 | Center Linen Can | 0 | 0 | 2 | 0 |
| 2 | 2-01 | Phone Handle | 0 | 0 | 0 | 0 |
| | 2-02 | Return Air Vent | 0 | 0 | 1 | 0 |
| | 2-03 | Monitor Arm | 0 | 0 | 0 | 0 |
| 3 | 3-01 | Left Sink Floor | 1 | 0 | 51 | 0 |
| | 3-02 | Top Trash Can | 5 | 0 | 0 | 0 |
| | 3-03 | Light Switch | 1 | 0 | 1 | 0 |
| 4 | 4-01 | Scale Buttons | 0 | 0 | 0 | 0 |
| | 4-02 | White Shelf Tray | 0 | 0 | 2 | 0 |
| | 4-03 | Cabinet | 0 | 0 | 0 | 0 |
| 5 | 5-01 | Glass Window on Door | 1 | 0 | 6 | 1 |
| | 5-02 | Sink Backsplash | 0 | 0 | 1 | 0 |
| | 5-03 | Soap Dispenser | 0 | 0 | 0 | 0 |
| 6 | 6-01 | Sink Backsplash | 0 | 0 | 0 | 0 |
| | 6-02 | Food Refridg Door | 0 | 0 | 0 | 0 |
| | 6-03 | Return Air Vent | 0 | 0 | 0 | 0 |
| Average | | | 0.72 | 0.06 | 5.39 | 0.06 |



CONCLUSIONS

The CASPR Test units demonstrated effectiveness using a comparison of the average of each swab location with repeated testing pre- and post installation of CASPR, from samples collected from air and surfaces in a NICU in a health system. This study demonstrates the effectiveness of this novel technology, CASPR, capable of inactivating fungal spores, and bacteria, from the attached laboratory testing by an independent laboratory. Based on these results, a call for improving air quality in healthcare environments, and an awareness of the significant HAI risks for neonates in the NICU, we believe that implementation of CASPR units is essential within the NICU environment.

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