

Reducing Infection Risk and Improving the Patient Experience in our Dental Practice

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At McLean Dental Care, we continuously seek solutions to improve the patient experience and distinguish the practice in a competitive market. We recently evaluated and installed new technology from airPHX | Health that reduces infection risks and improves the patient experience. Feedback from patients and staff has been overwhelmingly positive.

THE PATHOGEN PROBLEM

Even with strict protocols, antimicrobial resistant pathogens such as *Influenza*, *Hepatitis A, B and C* and *H1N1* and similar flus pose ongoing challenges for dental professionals, staff and patients. In a business that serves the public, we continuously risk exposure to viruses afflicting the community. Existing methods to address this challenge have included manual cleaning and personal hygiene such as handwashing and use of air purifiers. These methods have limitations and can be compromised by one contagious patient or staff member inadvertently spreading a virus throughout the practice. It is very expensive to cancel even a single day of appointments because of a sick doctor or dental hygienist – and proactive steps to reduce this risk can have immediate and long-term economic benefits.

airPHX TECHNOLOGY

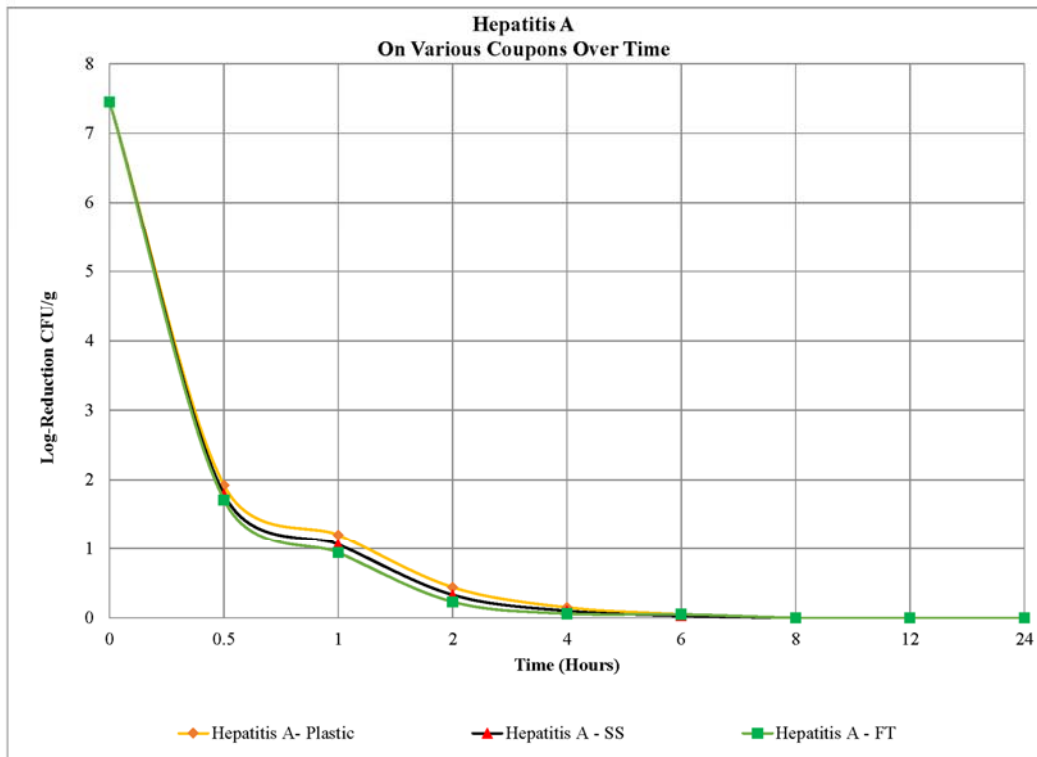
airPHX uses a proprietary atmospheric cold plasma to generate reactive oxygen species (ROS). Deployed extensively in the food safety world, airPHX has miniaturized and adapted this technology for health care and dental practices. The technology works with a two-step process: (1) any airborne organisms are oxidized immediately as they pass through a wall-mounted air handling device; and (2) a small amount of ROS molecules are distributed into our practice where they oxidize and eliminate airborne and surface germs. The airPHX technology works in the background, continuously eliminating viruses, bacteria and molds. The result is a cleaner, healthier practice.

LAB TESTING

Before purchasing this technology, we reviewed lab testing conducted by Dr. Rick Falkenberg, Ph.D. CFA, Scientific Air Solutions, Turlock, California. In a series of tests in 2017, Dr. Falkenberg evaluated the effectiveness of the technology for eliminating a variety of health-care related infection (HAI) pathogens on surfaces. Thirty pathogens were tested including bacteria, viruses and protozoa. Dr. Falkenberg's protocols included: (a) stainless steel, plastic and linoleum coupons inoculated with the actual organisms; (b) exposing the organisms to ROS generated by a portable airPHX unit; and (c) measuring the rate of kill. Of the pathogens evaluated, the

technology resulted in approximately a 4-log reduction in each organism in 30 minutes (from 10,000 organisms to 1) and effectively a total kill after four hours. See Figure 1 below for *Hepatitis A* testing summary, showing almost a 6-log reduction in the organisms within 30 minutes of exposure to the ROS. Almost all other pathogens showed similar trajectories.

Figure 1. Lab test results showing the change in Hepatitis A organisms on stainless steel, plastic and linoleum coupons after exposure to airPHX technology.

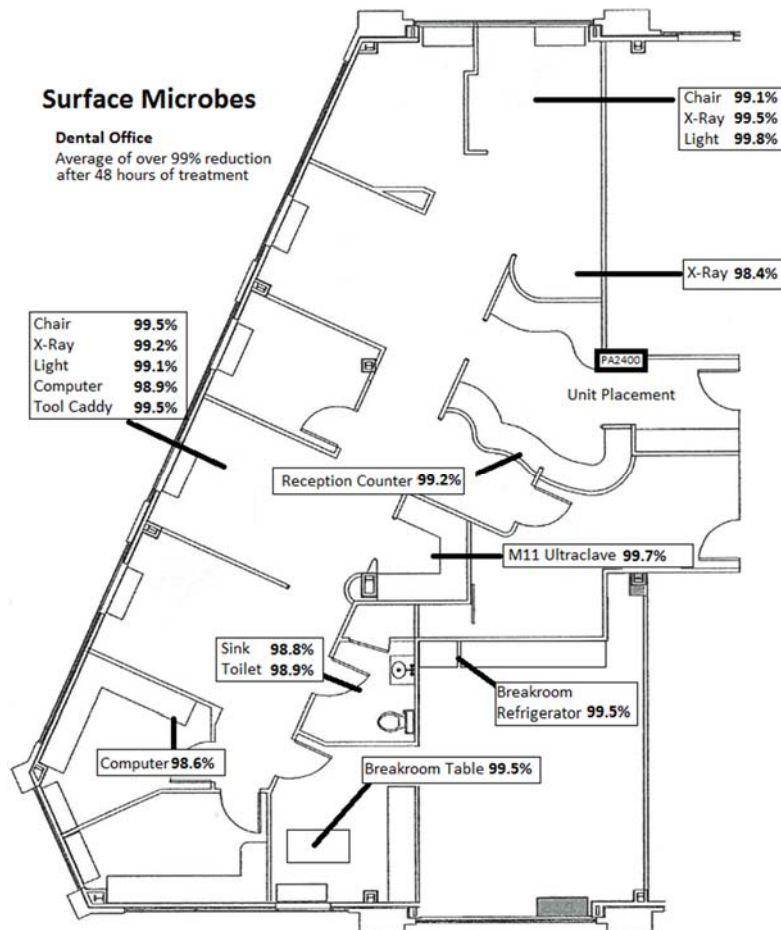


CASE STUDY – OUR PRACTICE

We deployed airPHX in our practice in January 2018, installing a wall mounted unit airPHX unit behind the reception check-in desk. Prior to our purchase decision, we conducted pre-treatment and in-treatment testing – air quality and surface swabs – to confirm the efficacy of the technology in our practice. The initial trial took place over a weekend, where a portable airPHX unit was activated Friday afternoon through Sunday morning. Testing included 17 volumetric air samples at various locations in the practice and 16 surface swabs on several high-touch surfaces, both administrative and treatment areas. Figure 2 provides a summary of testing locations. We forwarded the samples to Dr. Falkenberg’s lab for evaluation, and the results were a dramatic reduction in organisms as measured by colony forming units (CFUs) in the practice

area.

Figure 2. Floor plan diagram showing reductions of germ counts on surfaces in the McLean Dental Care offices.



After we installed the technology on a permanent basis, we are using the unit nightly to thoroughly treat and sanitize our offices, providing a clean and sanitized environment at the beginning of each day. After the permanent installation, we conducted a second round of in-treatment testing to validate efficacy. Shown in Table 1, the airPHX technology resulted in elimination of over 98% of airborne organisms and over 99% of surface germs. Results were realized throughout the practice area and include cleaning rooms, equipment, high-touch services and even the rest rooms and kitchen – clean all over.

TABLE 1. Tabular testing results: McLean Dental Care

Sample Location	Number of Samples	Colony Forming Units (Average) (1)			Initial Percent Reduction	Total Percent Reduction
		3/24/2017 Pre-Treatment	3/26/2017 In-Treatment	4/20/2018 In-Treatment		
Air Samples						
McLean Dental Care (various locations)	17	586	80	12	-86.3%	-98.0%
Exterior	2	3,200	3,083	3,433	-3.7%	7.3%
Surface Samples						
Treatment Area (see Figure)	16	303	9	2.00	-97.0%	-99.3%

(1) CFU/m³ for air samples. CFU/cm² for surface swabs.

CONCLUSIONS

We have been very pleased with the effect of this technology on McLean Dental Care. The testing results showed excellent reductions in pathogen counts throughout the practice. Our patients have noticed a difference in a clean smell, more welcoming environment for patients with respiratory issues and a healthy staff. These benefits more than compensate for the cost of the unit. Going forward, however, we are expecting significant ROI from fewer sick days for doctors and staff – avoiding just two sick days (and the related appointment cancellations) justifies the cost of the equipment.

Protect... Don't Infect!