Feb 21, 2017

To Whom It May Concern,

Approximately 3 years ago, I became interested in aqueous ozone as a disinfectant and sanitizer. I began reading in depth about it.

I learned that Ozone is a very powerful oxidizer that is used all over the world to sanitize city drinking water without chlorine. In the US, the FDA proclaimed that Ozone is a sanitizing oxidizer, both in aqueous and gaseous form that was generally regarded as safe for use on food and it supported its use in industrial food applications like in wineries, fisheries, poultry plants etc.

It is well known that O3 ozonated water kills just about all microbes from 30 seconds to 2 minutes of contact time, including Bacteria, Viruses, Molds and Spores. Because O3 is an unstable molecule it, then decomposes (after about 20 minutes), into plain water (H2O) and Oxygen. Currently, Ozone gas in higher concentrations is used as a disinfectant in sealed surgical equipment. A Swiss manufacturer has devised a sink system sold the Canadian medical market that produces low flow aqueous ozone for use in sanitizing sinks, drains and ostensibly hands. This furthered my interest as an application for the medical industry.

 Additionally, I learned that the use of common sanitizing chemicals poses risks for the users and that ‘Super-bugs’ are developing resistance to traditional disinfecting chemicals. In 2016, the FDA banned about 17 anti-microbial products used for sanitation as ineffective and some as environmentally dangerous, creating a deficit of available agents that a facility can use. From my initial research I found no evidence to show that any microbial can develop a resistance to ozone oxidation and few adverse environmental effects of ozone at low concentrations.

As medical director of a surgical center and of a busy medical practice, I wanted a safe alternative to toxic chemicals. I wanted a method of delivering a strong sanitizing agent that is affordable, effective, safe and environmentally friendly. As such, I became further interested in aqueous ozone as a disinfectant or sanitizer.

I decided to perform clinical testing for a variety of ozone water uses. In 2017, at Alliance Surgical Center in California, we published a Handwash Study in Becker’s Healthcare Publication! Please review: http://www.beckershospitalreview.com/quality/hand-hygiene-skin-atp-study-hand-washing-with-tap-water-and-soap-vs-ozonated-water-and-soap-vs-antiseptic-and-ozonated-water-vs-antiseptic-and-tap-water.html

 The results were promising with aqueous ozone reducing bioload by over 97% and being found comparable to washing of the hands with Hibiclens scrub solution.

I then looked into surface cleaning and disinfection. (eg sinks, table tops, counters etc.) We found that all surfaces inherently have a bio-film. We learned that the biofilm must be removed with some method, such as a commercial alcohol wipe or soapy water as a preliminary cleaning step. This initial step **alone** was found to be ineffective. By applying aqueous ozone as a final step, the process effectively sanitized the surface by destroying mostly all bacteria, viruses, fungi, and spores. No other sanitation step or rinse step after the use of ozone was found to be necessary. We found that the ozone water left absolutely no residual on the surface. A bit more work, but this process achieved our goal of improved sanitation.

In my search, I found that a commercial Faucet that is distributed by Sanitas in the USA, offered much of what I needed to augment our facility’s need for medical /surgical suite sanitation.

The Sanitas product consists of an esthetically pleasing brushed stainless (or chrome) faucet that connects to a water supply lines under the sink cabinet and small standard AC powered electrical box that together produce the ozone gas. The freshly produced ozone gas passes up a tube and is mixed with the water in a Venturi tube in the nozzle of the faucet. Our facility’s faucets were installed within 30 minutes with no special plumbing or cabinet work required. The ozone faucet system consistently produces a flow rate of about 1.2 gallons per minute (same as any common faucet) and tests at an ozone concentration of between 0.8 and 1.4 ppm. This concentration was found to be safe to use (within EPA safety levels) and has shown to be very effective as a rapid reacting anti-microbial. I estimate that at our small surgical center, there is a cost savings of between $3000 and $4000 per year by eliminating some chemical sanitizers. The O3 Sanitas system used in our facility sink cost us only about $2500. The product carries a 5-year warranty and can produce ozone for 20,000 hours, that’s nearly 1.5 million gallons of aqueous ozone!

The product has become part of our daily sanitation routine and may have more infection control applications, yet to be discovered. I wholeheartedly recommend that your facility look into installing one or more of this new technology.

 Sincerely,

***A. Liceaga, MD***

*Board Certified Interventional Pain Management*

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