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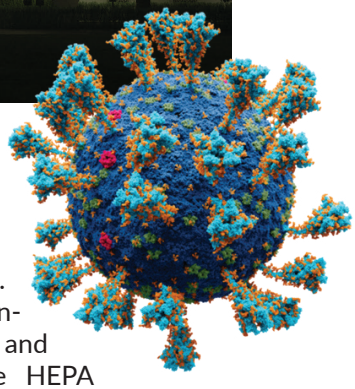
Clean Air in Buildings Plan Not Going Far Enough to Stop COVID

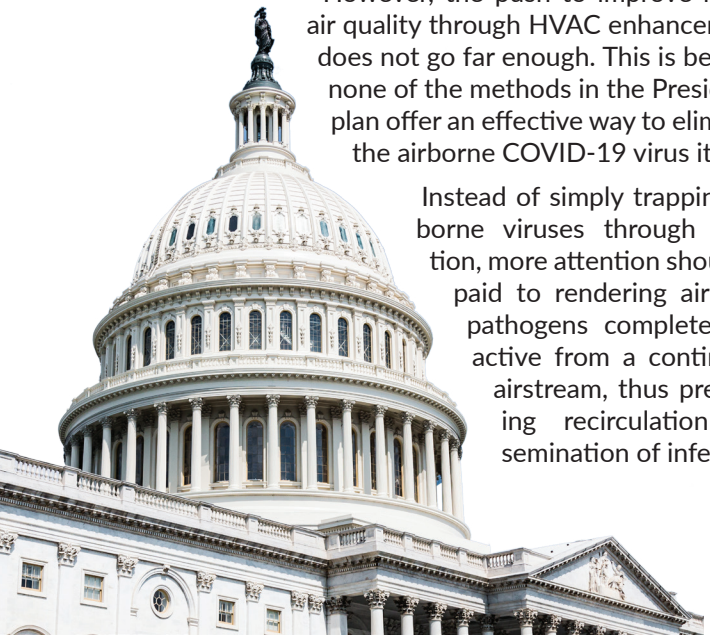


The White House recently elevated clean air in buildings as a top priority in the fight against COVID-19. The Administration's latest initiative urges leaders, building owners, and facility managers to improve indoor air quality in buildings through upgrades to their current ventilation systems.

The White House's shift to focus on air quality in buildings is an encouraging, albeit long overdue step forward in preventing airborne transmission of COVID-19 indoors. With the widespread availability of vaccines, rapid testing, N95 masks, and new antiviral treatments, a similar focus on improving air quality stands as the final piece of the puzzle to combat the spread of the virus.

However, the push to improve indoor air quality through HVAC enhancements does not go far enough. This is because none of the methods in the President's plan offer an effective way to eliminate the airborne COVID-19 virus itself.

Instead of simply trapping airborne viruses through filtration, more attention should be paid to rendering airborne pathogens completely inactive from a continuous airstream, thus preventing recirculation dissemination of infection.



Standard air handling systems integrated with HEPA filtration can pose a continued risk to building health. Outdated HVAC systems contribute to poor air quality and adequate ventilation, while HEPA filters require frequent maintenance and pose a risk of recontamination during maintenance and filter replacement.

The emergence of innovative technology amid a global pandemic is one of the few positives to come out of the pandemic. The "new normal" calls for new standards in air quality, and SteriSpace will be what carries us through the next phase of the pandemic.

SteriSpace air sterilization technology uniformly sterilizes the air in one pass while continuously recirculating sterilized air. In addition to little to no required maintenance, there are no drawbacks to buildings investing in our air sterilization technology.

As the pandemic marches on, the need to adopt a comprehensive airborne viral prevention strategy has never been more apparent. SteriSpace air sterilization technology is both the key to this strategy and a path to healthier buildings.

SARS- COV2 Pandemic-Conflict Between Human and Microbe Brief Review and Some Thoughts

Satish Sharma MD, FACS

We have experienced the devastating impact of the current pandemic as numerous lives have been lost worldwide. Since the declaration of this pandemic, the SARS-CoV-2 virus has affected a significant number of people, created uncertainty and inflicted stress and trauma. The unbelievable potential and capability of these microscopic pathogens to inflict an unimaginable health blow to the humans and animals has been there to see. Countries worldwide have faced unparalleled medical and economic situation. Governments all around the globe enforced strict and impactful measures to implement quarantines on a scale never seen before for the protection of their constituents. Individual and organizational financial security has been drastically threatened. Quarantines, closures and other such restrictions however led to significant fiscal implications. No one has remained immune to unpredictable impact of the disease

Globalization has led to unparalleled human mobility and interaction along with increased health risks. While to some, the fall of the Berlin wall sparked globalization, to others, it was much earlier synonymous with the occurrence of plague in numerous cities all over the world around the beginning of the 19th century. With rapid transport of the microbes, once confined to isolated geographical areas in some part of the world, no nation is immune to the growing global threat. Pathogens can rapidly spread from anywhere to anywhere to facilitate the distribution, and spread of the diseases. Healthcare institutions are another significant source of infections to a large number of patients and these are termed as nosocomial infections. Healthcare associated infections (HAI's) are a significant cause of morbidity and mortality and a great economic burden to the health care system in general. Infectious diseases have remained prominent killer worldwide. It has been reported that for every one-hundred patients admitted to hospital, seven patients in high-income economies and ten in emerging and low-income economies acquire at least one type of HAI's. In the United States at any one time, 4 % of the hospitalized patients are affected by an HAI. A large majority of acute illnesses that occur in USA every year are respiratory infections caused by common flu and viruses. In the United States, each year on average 3% to 11% of the population gets the flu. CDC estimates that flu has resulted in 9 million–41 million illnesses, 140,000–710,000 hospitalizations and 12,000–52,000 deaths annually between 2010 and 2020. Influenza is therefore a serious concern for the healthcare providers. In terms of mortality, infectious diseases closely follow cardiac diseases and cancers.

Nature's' most elegant creation, the Humans, have to live in a complex relationship with nature's least, the microbes in this ecosystem. Microbes, the invaders, with their potential and virulence may be a threat to the existence of the humans and maintain the ability to survive and dramatically flourish at radiation levels a thousand times higher than those that would kill humans. Similarly, microbes are also essential for the survival of the humans as they help in the development of immune defense and strengthen the digestive system. Their unique role at the end of life by helping in the decomposition of the remains of dead animals and plants is vital. A deep insight into this unique relationship depicts the fascinating balance maintained by nature.

Microbes can affect us or our children and loved ones at any given opportunity and this fear has been further strengthened with emergence of this pandemic. Little more than a century ago, death in childhood from infectious disease was common even in wealthy countries. Given the complexity of the medical science, the advancement in the field is a slow process. Medical science continued to chart a new course and the knowledge gained by earlier generations through assumptions and observation of the disease process in humans and animals became the foundation for future development. Organized scientific enquiry eventually established the existence of disease causing pathogens. Girolamo Fracostoro wrote about contagious diseases in 1546 and was the very first person to hypothesize that diseases could be transmitted by tiny agents too small to be visualized with the naked eye and defined them as seminaria or seeds of disease. Antoni Van Leeuwenhoek in Holland and Robert Hooke in England hundred years later established the existence of seminaria by using a newly developed microscope. For the first time, scientists glimpsed the building blocks of life through microscope. Fracastoro's theory was substantiated in the late 19th century when Louis Pasteur from France, Robert Koch from Germany and others eventually identified specific disease causing germs tracing their transmission and invented vaccines. All this breakthrough work led to the discovery of Penicillin, world's first truly potent antibiotic to destroy the germs when a British bacteriologist first noted the antibacterial properties of the blue mold Penicillium notatum also now known as P.chrysogenum. Similarly some other highly effective drugs were discovered.

Microbes may spread by direct contact, airborne spread, and vector borne spread, fomite spread, oral ingestion or zoonotic (animal diseases) transmission. Since the announcement of the COVID-19 pandemic that spread across world, there has been a need to understand the scientific basis of this dreaded disease. Continued research efforts showed promising results and numerous publications have established the airborne spread of the SARS COV 2 virus. Airborne spread implies the spread of pathogens over a distance of more than several feet between the source and the affected and can be lethal and difficult to control due to their small size. Aerosolized particles are generated by coughing or sneezing. Virulence of the pathogen and environmental factors like temperature, sunshine, wind and humidity influence the spread of airborne infections. Dreaded diseases like Tuberculosis and Anthrax are classical examples of air borne transmission. Tuberculosis is the leading infectious disease killer in the world. Other examples may include Legionellosis, Bordetella pertussis, Severe acute respiratory syndrome (SARS) Middle East Respiratory Syndrome (MERS) etc.

Innovations and technologies constantly shape the world. With enhanced information about the pathogens through medical research, we have to protect our communities, prioritizing particularly the vulnerable groups including our children, elderly, pregnant women and immune compromised with the tools in hand while developing more for an effective disease control. Most of the Healthcare associated infections are preventable. Vaccinations are a great tool. Vaccination campaigns are designed to protect general masses. Once a sufficient number of individuals in a community have been vaccinated, even those too vulnerable to receive the vaccine can get some safety cover. As we seek to improve and save lives, we have to develop strategies to combat the pathogens at home, school, work and places including but not limited to hospitals, community centers, libraries. Protecting our children effectively and decisively will help them improve their performance and have regular attendance in the classes. WHO–UNICEF–Lancet Commission report published in February 2020 focused on the future for the world's children with a clarion call to prioritize the children and adolescents health at the forefront of all endeavors to achieve sustainable development.

As we spend major part of the day (approximately 20 hours) indoors, healthy environment is essential. Unhealthy indoor environment could lead to a medical condition called Sick Building Syndrome. Healthy buildings will be associated with less worker absenteeism due to illness and better cognitive function. Reports emerging in media about the increasing number of cases and hospitalizations in places reported to have the highest vaccination rates further reflect that much more has to be done. The virus spreads through the air, continues to return with its contagious variants and therefore the indoor air quality has to be par excellent with placement of scientifically proven credible

technologies. Protected indoor environment with safe and efficient technologies, vaccinations with boosters, rapid tests and delivery of N95 masks, all have to be implemented as a synergistic response to fight with this pandemic in a coordinated way.

Federal and state agencies have put in substantial efforts and funding to reopen our schools and other organizations nationwide. The current Federal administration has now recognized that clean buildings matter for health. Effective plans will not only provide protection during the current pandemic, but will also provide protection for other airborne diseases and biological threats to the daily lives of our population. "Earlier this month, President's administration released the National COVID-19 Preparedness Plan to face COVID-19. Clean Air in Buildings Challenge was launched that calls on all building owners and operators, schools, colleges and universities, and organizations of all kinds to adopt key strategies to improve indoor air quality in their buildings and reduce the spread of COVID-19. The Office of Science and Technology Policy (OSTP), in coordination with other partners through the Pandemic Innovation Task Force, is identifying opportunities to drive innovation and implementation of technologies to support clean indoor air in buildings and reduce disease transmission" (Quoted lines- See Ref).

This period of crisis has placed us in a reshaped environment where development and application of science will play a defining role to help us be prepared in future. Continued education in context to disease control measures, rationale planning and effective strategies will enable us to fight with these small lethal microbes and control the spread of emerging and reemerging diseases.

References

1. Estimated Range of Annual Burden of Flu in the U.S. from 2010 – 2020. Disease burden of Flu. CDC estimates. https://www.cdc.gov › flu › about › burden
2. Mainul Haque, Judy McKimm, Massimo Sartelli. Strategies to Prevent Healthcare-Associated Infections: A Narrative Overview. Risk Manag Health Policy. 2020; 13: 1765–1780.
3. Nehad J.Ahmed, Abdul Haseeb, Emad, M. et al. Incidence of Healthcare-Associated nfections (HAIs) and the adherence to the HAIs' prevention strategies in a military hospital in Alkharj. Saudi Pharmaceutical Journal. 29:10, 1112-1119
4. Heneghan C, Spencer E, Brassey J et al. SARS COV-2 and the role of airborne transmission. A systematic review. F1000research 2021. https://doi.org/10.12688/f1000research,52091.1
5. Prather KA, Wang CC, Schooley RT. Reducing transmission of SARS- COV-2. Science 2020; 6498:1422-24
6. Trisha Greenhalgh, Jose L Jimenez, Kimberly A Prather et al. The Lancet. Ten scientific reasons in support of airborne transmission of SARS-COV-2. 397:1603; 2021.
7. The Secret Life of Germs. Philip M. Tierno. 2001
8. Sarah L Dalglish, Anthony Costello, Helen Clark, Awa Coll-Seck. Children in All Policies 2030: a new initiative to implement the recommendations of the WHO–UNICEF–Lancet Commission. Lancet, 2021. 1; 397(10285):1605-1607
9. Healthy Homes Barometer (2017), Buildings and their impact on the health of Europeans, VELUX. https://velcdn.azureedge.net/~/ media/com/health/healthy-homebarometer/507505-01 barometer_2017.pdf.
10. Biden administration elevates healthy buildings as part of national covid strategy. Joseph G. Allen. March 18, 2022. https://www.statnews.com/2022/03/18/biden-administration-finally-elevates-healthy-buildings-as-part-of-national-covid-strategy/
11. FACT SHEET: Biden Administration Launches Effort to Improve Ventilation and Reduce the Spread of COVID 19 in Buildings. https://www.whitehouse.gov/briefing-room/statements-releases/2022/03/17/fact-sheet-biden-administration-launches-effort-to-improve-ventilation-and-reduce-the-spread-of-covid-19-in-buildings/
12. Let's Clear The Air. OSTP Blog on COVID March 23, 2022• By Dr. Alondra Nelson, Head of the White House Office of Science and Technology Policy. https://www.whitehouse.gov/ostp/news-updates/2022/03/23/lets-clear-the-air-on-covid/

Overcoming Biofilm-Associated Resistance

John F. Gibbs, MD, MHCM

In the United States (U.S.) approximately 3 million antibiotic infections occur yearly and are associated with more than 35,000 deaths[1]. It is estimated that 65-80% of human infections are due to biofilms[2]. The 5th ASM Biofilm Conference defined biofilms as "aggregated, microbial cells surrounded by a polymeric self-produced matrix, which may contain host components"[3]. Römling et. al. (2014) estimated the total U.S. annual cost for biofilm infections at $94 billion 4. In 2050, it is estimated that the economic burden of antimicrobial resistant with amount to $100 trillion U.S. dollars and approximately 10 million deaths[4].

Biofilms pose a serious population health threat because of microbials ability to evade lethal external damage acquired over many millennia[5]. Regardless of the microbial species, biofilms possess the same basic features that can be exploited as putative therapeutic targets. Biofilm formation is a multistep process consisting of i) surface attachment, ii) microcolony formation, iii) biofilm maturation, and iv) cellular detachment/dissemination[2]. Razdan et. al. (2022) describes the biofilm matrix acting as a cocoon for microbials[2]. The matrix composed of an extracellular polymeric substance (EPS) consisting primarily of polysaccharides are secreted by the microorganisms themselves[6]. The EPS accounts for much of the biofilm matrix. During this multistep process, microbials gain the ability to crosstalk through cell-cell communication[3,6]. This cellular crosstalk, referred to as quorum sensing (QS), is unique to biofilm[2]. Biofilms may be associated with a wide spectrum of that medical device- and tissue-associated infections (Exhibit 1).

Exhibit 1. Examples of Biofilm-Associated Infections

Medical Device-Associated	Tissue-Associated
Breast Implants	Bacterial Vaginosis
Central Venous Catheters	Biliary Tract Infection
Endoscopes	Chronic Otitis Media
Endotracheal Tubes	Chronic Tonsilitis
Intrauterine Devices	Chronic Wounds
Mechanical Valves	Cystic Fibrosis/Lung Infection
Pacemakers	Dental Plaques
Peritoneal Dialysis Catheters	Endocarditis
Tympanostomy Tubes	Kidney Stones
Urinary Catheters	Osteomyelitis
Venous Access Devices	Urinary Tract Infections

Approximately 20 million chronic infections such as chronic wounds, surgical-site infections, and infected implants has been estimated to be associated with 550,000 deaths in the U.S.[7]. An expert panel attributes "the heterogeneous distribution of chronic biofilm-associated wounds to the presence in both the deep and surface tissue" representing the biggest challenge to diagnosis and management as well as the opportunity for ongoing research. The biofilm's intrinsic ability to evade the effect of antimicrobial therapy is most commonly due to several factors[8,9]. Antimicrobial agents must diffuse through the EPS matrix to inactivate the organism. Biofilm-associated organisms

may minimize the rate that antimicrobial agent can enter the cell and affecting its inactivation. The environment immediately surrounding the cells within a biofilm may provide protective conditions for the organism.

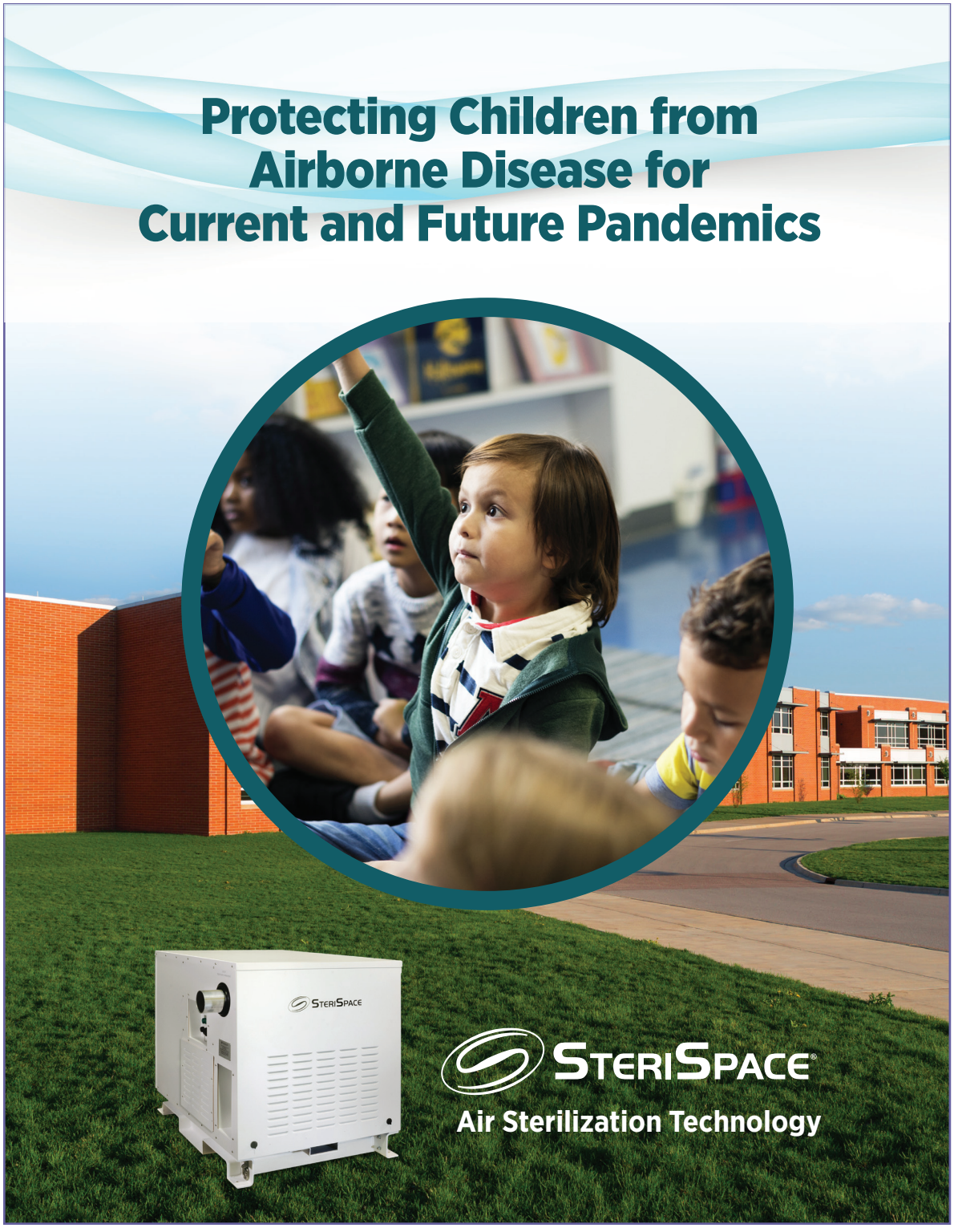
Focusing on anti-biofilm strategies that disrupt the biofilm matrix and enhancing the efficacy therapeutic agent delivery are under varying phases of investigation[9,10]. These include nanotechnology (e.g., nanocarrier), surface-modification, novel antimicrobial peptides, photodynamic therapy, anti-EPS enzymes, and engineered biological biofilm inhibitors to deter cell attachment or biofilm removal[10]. Nanotechnology-based strategies is particularly promising for biofilm control and treatment[11]. Nanotechnology has shown promise as either by the intrinsic antimicrobial properties of nanoparticles or their function as drug carriers. For example, nanoparticles embedded within bioactive wound dressing could serve as carriers into chronic wounds[12,13].

Improved understanding of the mechanism of biofilm formation and function as expanded the use of novel therapeutic approaches towards the eradication of biofilms in the future. Nanotechnology-based therapy can become a complementary game changer in preventing and managing chronic wound infections. Nanoparticle research aimed at the modulation of microbial colonization, biofilm formation and drug delivery are a promising area of investigation.

References

1. CDC Antibiotic Resistance Threats in the United States 2019. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2019. Doi: http://dx.doi.org/10.15620/ced:82532
2. Razdan K, Garcia-Lara J, Sinha VR, Singh KK. (2022). Drug Discov, Doi: https://doi.org/10.1016/j.drudis.2022.04.020
3. Wi YM, Patel R. (2018). Understanding Biofilms and Novel Approaches to the Diagnosis, Prevention, and Treatment of Medical Device-Associated Infections. Infect Dis Clin North Am 32(4): 915-929. Doi: 10.1016/j.idc.2018.06.009
4. Römling U, Kjelleberg S, Norwark S, Nyman L, Uhlin BE, Åkerland B. (2012). Microbial Biofilm Formation: A Need to Act. J Internal Medicine Doi: 10.1111/joim.12242
5. Wolcott R, Dowd S. (2010). The Role of Biofilms: Are We Hitting the Right Target? Plast Reconstr Surg 127(No. 1S). Doi: 10.1097/PRS.0b013e3181fca244
6. Wilson M. (2001). Bacterial biofilms and human disease. Sci Prog 84(3). 235-254
7. Wolcott RD, Rhoads DD, Bennett ME, Wolcott BM, Gogokhia L, Costerton JW, Dowd SE. (2010). Chronic Wounds and the Medical Biofilm Paradigm. J Wound Care 19(2). https://doi,org/10.12968/jowc.2010.19.2.46966
8. Koo H, Allan RN, Howlin RP, Hall-Stoodley L, Stoodley P. (2017). Targeting Microbial Biofilms: Current and Prospective Therapeutic Strategies. Nat Rev Microbiol 15(12): 740-755. Doi: 10.1038/nrmicro.2017.99
9. Malone M, Goeres DM, Gosbell I, Vickery K, Jensen S, Stoodley P. Approaches to Biofilm-associated Infections: The Need for Standardized and Relevant Biofilm Methods for Clinical Applications. Expert Rev Anti Infect Ther 15(2): 1145-156. Doi: 10.1080/14787210.2017.1262257
10. Zhang K, Li X, Wang Y. (2020) Promising Therapeutic Strategies Against Microbial Biofilm Challenges. Front Cell Infect Microbiol 10: Article 359. Doi: 10.3389/fcimb.2020.00359
11. Ramasamy M, Lee J. Recent Nanotechnology Approaches for Prevention and Treatment of Biofilm-Associated Infections on Medical Devices. Biomed Res Int, Article ID 1851242, http://dx.doi.org/10.1155/2016/1851242
12. Mihai MM, Preda M, Lungu I, Gestal MC, Popa MI, Holban AM. (2018). Nanocoating for Chronic Wound Repair-Modulation of Microbial Colonization and Biofilm Formation. Int J Molec Sci 19, 2019; doi: 10.3390/ijms19041179
13. Yeh YC, Huang TH, Yang SC, Chen CC, Fang JY. (2020). Nano-Based Drug Delivery or Targeting to Eradicate Bacteria for Infection Mitigation: A Review of Recent Advances. Front Chem 8: Article 286. Doi: 10.3389/fchem.2020.00286

SteriSpace Community Involvement



Prosthetic Infection is a Serious Healthcare Concern

David B. Lillie, MD

The first credible description of penile anatomy and the concept of erection was made by Ambriose Pare in the 16th century[1]. Since then, continued research has helped establish a comprehensive understanding of the penile structure and mechanism of erection. With multiple medical issues contributing towards its occurrence, erectile dysfunction (ED) has emerged as a significant health hazard. Cigarette smoking, diabetes, high blood pressure, heart disease and numerous medications have been directly associated with erectile dysfunction. In 1973, Dr. F Brantley Scott performed the first inflatable penile prosthesis implantation[2]. Penile prosthesis implantation was considered to be the most effective method to treat ED prior to 1983. Medical management of erectile dysfunction has now become a preferred initial alternative. Prosthesis insertion has evolved as a viable option if the medical or minimal invasive management fail. However higher treatment dissatisfaction has been noted with medical management as compared to the penile implant surgery[3].

Prepandemic, approximately 24,000 penile prosthetic implants were being done each year in the United States. In spite of innovative advancements in the prosthetic implants care, 7% to 20 of patients may experience complications related to mechanical malfunction, infection and erosion[4,5]. The issue of infections associated with penile implant surgeries continues to remain a challenge with an infection rate of 1-3% with initial implantation. Infection will usually end up with removal of the prosthesis. The estimated cost of removal of penile prosthesis is about ten thousand dollars. Surgical site infection is the most feared complication and may lead to pain, abscess and sepsis that may require prompt hospitalization and surgical revision6. The prosthesis removal leads to fibrosis of the corpus cavernosum and reduction of penile length and girth, making a new prosthesis insertion much more difficult[6]. Factors known to contribute to increased risk of infection include but not limited to smoking, immunosuppression, substance abuse and homelessness. There is evidence of a three-fold higher risk of penile prosthesis infection in diabetics as compared to nondiabetic patients[7]. Patients with diabetes are more prone to infection because of leucocyte function and microangiopathy. Most infections are evident within eight weeks of the implantation and often are to be seeded by contamination of the device with skin organisms. Therefore, careful surgical technique to limit this contamination may help in minimizing the infection rate[8]. These include vigorous irrigation with antiseptic solution, frequent glove changes and surgical field isolation.

Contamination of the implant during the penile implant surgery can serve as the main mode of entry of microorganisms into the surgical field. Different ways to decrease the infection rate may include preoperative measures such as home showers with chlorhexidine and avoiding home genital shaving for at least two weeks prior to surgery. Careful preoperative examination for evidence of infection including urine culture and nasal MRSA testing and, if positive, treatment with mupirocin have demonstrated a drop in the infection rates[9]. Staphyloccus species, especially Staphylococcus epidermidis are the most common organisms identified in penile prosthesis infection and have been

isolated from 35% to 56% of infected patients. Henry et al[10] reported a multicenter study of culture from all parts of prostheses removed for mechanical failure. In this carefully done study, 70% of removed prostheses were colonized and the pathogens were usually S. epidermidis or S.lugdunensis. S. Epidermidis and S. Aureus have been shown to have a greater adherence to prosthetic surfaces[11]. These species have demonstrated an enhanced ability to produce glycocalyx biofilm that potentiates their infectious activity and capacity.

Factors that may contribute towards control of prosthesis infection may include but not limited to preoperative clipper hair removal, good personal hygiene and perioperative insulin management of patients with blood glucose more than 200 mg/dl. Post-operative drains have been shown not to increase risk of infection and may be used at the surgeon's discretion to avoid hematomas. Vigorous irrigation with or without antibiotic helps as does frequent glove changes and surgical field isolation. Latent infections up to a year or more probably from hematogenous sources have been noted. Implant manufacturers like Boston Scientific coats its devices with a rifampin/minocycline film and Coloplast coats its devices with an absorbent layer designed to bind to antibiotics used in an intraoperative irrigation solution. These measures may drop infection rates by half although it has been suggested that the infections then seen are caused by more resistant organisms such as staphylococcus aureus or gram-negative bacteria[12,13,14]. Perioperative antibiotic recommendations now include gentamicin with vancomycin or a third generation cephalosporin. Fluconazole may also be considered since 10% of the infections are yeast. Postoperative antibiotics seem to have little effect.

Resistant Prosthetic infection is more often managed by removal of the device and delayed reimplant. However, delayed reimplantation still carries a significant risk of infection in 20% of such cases. Subsequent infections have been noted in prosthesis replacement secondary to existing infection or replacement of the device for a mechanical failure without existing infection. There is even an increased risk of infection in replacing an overtly uninfected malfunctioning prosthesis. Biofilms have a significant role to play in occurrence of infections and are mostly resistant to all efforts aimed at its removal[11,12]. Biofilms are constituted by cells irreversibly attached to a surface or to each other and embedded in a matrix of extracellular polymeric substances. Biofilm presence may provide protective environment to the bacteria by decreasing the antibiotic and host defense penetration, leading to clinical infections which may require penile implant removal[15,16,17,18]. Biofilm-forming pathogens include Staphylococcus epidermidis, Staphylococcus aureus, Klebsiella pneumonia, Pseudomonas aeruginosa, Escherichia coli, and Candida albicans. Prosthetic encapsulation with scar tissue that while not colonized per se will act as a nidus for de novo postoperative infection.

References

1. Bernot PH: Male impotence- a historical perspective. L'Esprit du Temps, France 1994
2. Scott FB, Bradley WE, Timm GW. Management of erectile impotence. Use of inflatable prosthesis. Urology 1973; 2:80-2
3. Tiefer, L., Pederson, B. and Melman A.: Psychological follow up of penile prosthesis implant patients and partners. J Sex Marital Ther. 1988, 14:184.
4. Natali, A., R. Olianas, and M. Fisch, Penile implantation in Europe: successes and complications with 253 implants in Italy and Germany. The journal of sexual medicine, 2008. 5(6): p. 1503-1512.

5. Li, K., et al., Trends in penile prosthesis implantation and analysis of predictive factors for removal. World Journal of Urology, 2019. 37(4): p. 639-646.
6. Carson, C., Antibiotic impregnation of inflatable penile protheses: effect on perioperative infection. 2004, Taylor & Francis. p. 165-167.
7. Angulo, J., et al., Diabetes exacerbates the functional deficiency of NO/cGMP pathway associated with erectile dysfunction in human corpus cavernosum and penile arteries. The journal of sexual medicine, 2010. 7(2): p. 758-768.
8. C C Carson. Diagnosis, treatment and prevention of penile prosthesis infection. International Journal of Impotence Research. 2003, 15:139–146.
9. Kevin J. Hebert,Tobias S. Kohler. Penile Prosthesis Infection: Myths and Realities. World J Mens Health. 2019, 37(3): 276–287.
10. Gerard D. Henry,* Culley C. Carson, Steven K. Wilson. Revision Washout Decreases Implant Capsule Tissue Culture Positivity: A Multicenter Study. 179: 186-190.
11. Takayuki Shida,Hironobu Koseki,Itaru Yoda. Adherence ability of Staphylococcus epidermidis on prosthetic biomaterials: an in vitro study. Int J Nanomedicine. 2013; 8: 3955–3961.
12. Lokeshwar, S.D., et al., A surgeon's guide to the various antibiotic dips available during penile prosthesis implantation. Current urology reports, 2019. 20(2): p. 1-6.
13. Chiang, H.-S., C.-H. Liao, and M.-L. Chang, Benefits of antibiotic-impregnated inflatable penile prosthesis (InhibiZone®) in patients at high risk of infection in Taiwan. Urological Science, 2016. 27(3): p. 144-147.
14. Carson, C.C., Efficacy of antibiotic impregnation of inflatable penile prostheses in decreasing infection in original implants. The Journal of urology, 2004. 171(4): p. 1611-1614.
15. Wilson, S.K. and J.W. Costerton, Biofilm and penile prosthesis infections in the era of coated implants: a review. The Journal of Sexual Medicine, 2012. 9(1): p. 44-53.
16. Costerton, J., L. Montanaro, and C.R. Arciola, Biofilm in implant infections: its production and regulation. The International journal of artificial organs, 2005. 28(11): p. 1062-1068.
17. Herati, A.S. and E.M. Lo, Penile prosthesis biofilm formation and emerging therapies against them. Translational Andrology and Urology, 2018. 7(6): p. 960.
18. Dawn, L.E., et al., Biofilm and infectious agents present at the time of penile prosthesis revision surgery: times are a changing. Sexual Medicine Reviews, 2017. 5(2): p. 236-243.

Teeth Chatters Podcast Offers Continuing Education Courses

TEETH CHATTERS PODCAST

Host Sara Juliano, RDH
You First Services Educator

The Oral Healthcare department is proud to announce the growth of the Teeth Chatters Podcast. The Teeth Chatters Podcast is positioned for our most significant target market, the dental industry and other professionals and consumers. Teeth Chatters focuses on producing episodes to educate listeners on the connection between oral and systemic health issues and topics.

Since its launch in October 2021, we have released eight podcast episodes about the correlation between oral and systemic health. The podcast has over 300 plays and a growing following on Instagram, Facebook, and LinkedIn. We have begun collaborating with other dental professionals to be guests on Teeth Chatters, and in some cases, host Sara Juliano, RDH, will be a guest on their podcast.

We are happy to share that we have been accredited by AGD's Program Approval for Continuing Education (PACE) to offer continuing education credits for healthcare professionals with podcast episodes. We will offer ten episodes per year on the platform CE Zoom for professionals to earn CE credits after completing a test on the respective podcast material.

Upcoming Teeth Chatters Guests:

Dr Tarryn MacCarthy, Host of The Business of Happiness Podcast

Colette Murray, RDH, AUTHOR of Get Your Spit Together

Dr. Charles Reinertsen, DMD, Dentistry Practitioner, Ted Talks presenter

Jill Meyer- Lippert, Founder and CEO of Side Effect Support LLC

Hal Stewart, DDS, FACD, Host of Health & Harmony Beyond the Teeth podcast

A New Standard of Care for Indoor Air Quality Control

Ashley N. White, PhD
Research Scientist, You First Services INC.

Introduction

Over the last two decades, there have been increased efforts made by the scientific community in hopes to improve poor indoor air quality (IAQ) and to reduce the harmful effects that airborne biological contaminants can have on human health (1, 2). Airborne biological contaminants or "bio-contaminants" are pollutants of biological origin (3). Such contaminants are, or are produced by living organisms such as bacteria, viruses, fungi (including molds and mildews), allergens (including pet dander, insect debris, dust mites, and pollen), as well as biological byproducts such as mycotoxins released from fungi and endotoxins released from bacteria (4-6). Airborne biological contaminants within indoor air often exist in the form of bioaerosols. Bioaerosols are very small airborne suspended particles (less than 5 microns in diameter) that are living or are released from living organisms (7, 8). They are present virtually anywhere in the environment, and due to their small size and light weight, they can easily travel from one environment to another (9). Bioaerosol exposure has been shown to cause numerous adverse health effects including but not limited to asthma, pneumonia, influenza, tuberculosis, and severe acute respiratory syndrome (10). Additionally, there is also ongoing concern for the possibility of the intentional release of lethal levels of bioaerosols as bio-warfare agents (11). Due to the small nature of these particles, they are able to remain suspended in the air for long periods of time (12-15). Additionally, because of their prolonged suspension, they have been shown to travel farther distances than respiratory droplets (13-15). Thus, bioaerosols are most often responsible for long-range airborne transmission. Long-range airborne transmission can involve direct human to human exposure of contaminants, or indirect exposure through circulating air through ventilation systems. Increased build-up of biological contaminants in ventilation systems often results in re-distribution of the contaminants back into the circulating air within that space (16).

Current Methods of IAQ Control

The following are examples of the current and frequently used methods in indoor air quality control: HEPA filtration, bipolar ionization, and ultraviolet germicidal irradiation (UVGI) (17-19). Although these methods have made improvements to indoor air quality, it has become increasingly more evident that each of these methods possesses undeniable limitations that require addressing.

HEPA Filtration

Today, HEPA filtration is considered the gold standard for air treatment. The acronym, HEPA, stands for high efficiency particulate air and is a type of pleated mechanical air filter (20). HEPA filters are theoretically able to remove at least 99.97% of airborne particles that are 300 nanometers or larger (20, 21). The greatest limitation of this type of air treatment is that it is essentially just filtration, meaning that the system merely traps airborne pathogens, it does not have the ability to kill them (22). Additionally, the filtration is quite limited by size of the particle (22). In regard to almost all viruses including SARS-CoV-2, their size is less than 300 nanometers. In fact, the SARS-CoV-2 virus is between only 90 and 125 nanometers, meaning it would likely be able to pass directly through a HEPA filter (23, 24). Unfortunately, HEPA filters also create an optimal breeding ground for harmful contaminants (25). In the absence of proper replacement protocols or when the current load on the filter has become too high, contaminants such as mold and

bacteria can grow on and through the filter membrane and eventually be released back into the circulating air (18, 25). Due to the build-up of particles and contaminants collected, HEPA filters also require frequent replacements which can cause high operating costs and unsafe exposure of biohazards to working technicians (18). With all the mentioned limitations in mind, along with the current state of the pandemic, it is becoming increasingly clear that HEPA filtration is not a complete solution to indoor air quality control. Thus, in order to compensate for the limitations of HEPA, the use of new and innovative technology must be considered. Indoor air quality control has an increasing need for a mechanism of "air sterilization" rather than mere air filtration, meaning that the airborne biological contaminants will not be merely trapped on a filter but will be effectively killed, leaving no way to be re-introduced back into the indoor circulating air.

Knowing that HEPA filtration must be augmented, alternative technologies have recently come to the forefront such as bipolar ionization and Ultraviolet Germicidal Irradiation. There has been a great deal of excitement in the media about these technologies, however, we rarely hear about the limitations associated with them.

Bipolar Ionization

Bipolar ionization (also called needlepoint bipolar ionization) cleans the air inside buildings by using an electrostatic charge to create a plasma field filled with ions (26). These charged ions then surround the airborne biological contaminants and subsequently break them down. Unfortunately, this technology has hazardous environmental effects associated with it. Ionizers generate potentially dangerous levels of carbon dioxide (CO2) and ozone which could be harmful to both humans and the surrounding environment (27). Furthermore, long-term CO2 buildup negatively impacts cognitive abilities (28). This adverse effect is of particular concern for k-12 school districts due to children being more vulnerable than adults to the adverse effects of breathing in CO2 (29). Studies have also shown that particle deposition increases with charge, meaning that the use of ion generators may not be effective at reducing the dose of particles to the lungs (30-32). Overall, the safety and effectiveness of bipolar ionization is questionable.

Ultraviolet Germicidal Irradiation (UVGI)

UVGI emits short-wavelength ultraviolet (ultraviolet-C or UV-C) light to kill or inactivate microorganisms by destroying nucleic acids and disrupting their DNA material, so they can no longer perform their cellular functions (33). This technology requires "exposure time" which could be up to several minutes (19). Microorganisms require direct exposure to the UV-C in order to be rendered inactive. Microorganisms that pass-through UV-C light with some velocity may not get enough exposure time to be affected. Attachment of microorganisms to suspended dust particles can also allow them to easily escape from UV-C treatment. UV-C is also known to degrade certain materials, such as plastic, polymers, and dyed textiles, so its use may not be applicable in certain settings. Similar to bipolar ionization, UVC lights generate ozone, and some lights also contain toxic mercury (19, 34). Additionally, the room must be unoccupied when the UV-C lights are illuminated. UV-C rays also disinfect by line of sight, meaning that only areas that UV-C light shines on directly will be treated and the shadow areas excluded. Thus, here as well, the efficacy and safety are quite questionable.

Along with the limitations described above, both bipolar ionization and UVGI are only able to achieve disinfection (killing/removal of vegetative microorganisms), not sterilization, which is defined as the complete killing of all forms of microorganisms, including bacterial spores. Sterilization is also often characterized by at least a 6-log reduction of microbial growth (99.9999% efficacy) (35). Both technologies display only around a 3-log reduction in microbial growth (99.9% efficacy) (36, 37).

Air sterilization Through Compressive Heating Technology

The term "air sterilization" was unheard of up until recently because there was no mechanism that

existed to effectively sterilize airborne particles. Now, a novel patented compressive heating technology is proving to make air sterilization a reality. This technology emerged from the University at Buffalo (UB), from modeling technology typically used for spacecraft airflow testing. You First Services then partnered with UB to continue the development of this novel technology in hopes to apply its capabilities to the growing concern with indoor air quality and the spread of airborne disease. The technology has been successfully proven to eliminate biological contaminants from continuous large volume air flows and is not limited by the size of the pathogen. It has also proven to provide sterile air back into circulation within a space that is free from airborne biological contaminants including viruses, bacteria, and hardy spores. Independent testing on the compressive heating technology funded by the U.S. Department of Defense has demonstrated a kill effectiveness greater than 99.9999%, which is equivalent to a 6-log reduction.

The concept of the compressive heating technology is based on the use of an electrically powered blower (or compressor) to move and compressively heat the incoming air flow to high enough treatment temperatures to kill the airborne biological contaminants. The kill mechanism is a function of temperature and residence time allowing the basic technology to scale to a broad range of flow rates using different compressor technologies including positive displacement blowers and superchargers for smaller units, and centrifugal fans for higher volume air flows. At a treatment temperature of 240°C (464°F), it has been shown to consistently kill greater than a 6-log kill (99.9999%) of microorganism including bacterial spores, vegetative bacteria, an anthrax simulant, and virus simulant.

Conclusion

Overall, the increasing concerns associated with current IAQ control make it clear that conventional ventilation systems and current filtration technology, on their own, are not sufficient for proper IAQ control of airborne biological contaminants. Ongoing advancements in technological capabilities present an opportunity for the development of solutions to effectively improve IAQ control. It is critical for current ventilation technology to be augmented with the use of new and innovative technologies that can effectively kill airborne biological contaminants, such as compressive heating. Due to the strong correlation between indoor air quality and human health, these improvements in IAQ control are imperative in order to promote long-term health and well-being. Compressive heating technology has been shown to effectively eliminate nearly all airborne pathogens it takes in from a given space and releases only sterile air back into circulation. Currently, the same cannot be said of any other existing air purification technology. Due to this ability of air sterilization, compressive heating technology presents a turnkey solution to effectively mitigate the spread of pathogens within indoor air and as such represents a new standard of care for indoor air quality control.

References

1. Jones AP. 1999. Indoor air quality and health. Atmospheric Environment 33:4535-4564.
2. Cincinelli A, Martellini T. 2017. Indoor Air Quality and Health. Int J Environ Res Public Health 14.
3. Kumar P, Kausar MA, Singh AB, Singh R. 2021. Biological contaminants in the indoor air environment and their impacts on human health. Air Qual Atmos Health doi:10.1007/s11869-021-00978-z:1-14.
4. Anonymous. 1988. Indoor air quality: biological contaminants. Organization WH, Regional Office for Europe,
5. Moldoveanu AM. 2015. Biological Contamination of Air in Indoor Spaces. Current Air Quality Issues 489-514.
6. Anonymous. Biological Pollutants' Impact on Indoor Air Quality, on United States Environmental Protection Agency https://www.epa.gov/indoor-air-quality-iaq/biological-pollutants-impact-indoor-air-quality. Accessed January 3.
7. Georgakopoulos D, Després V, Fröhlich-Nowoisky J, Psenner R, Ariya PA, Pósfai M, Ahern H, Moffett B, Hill T. 2009. Microbiology and atmospheric processes: biological, physical and chemical characterization of aerosol particles. Biogeosciences 6:721-737.

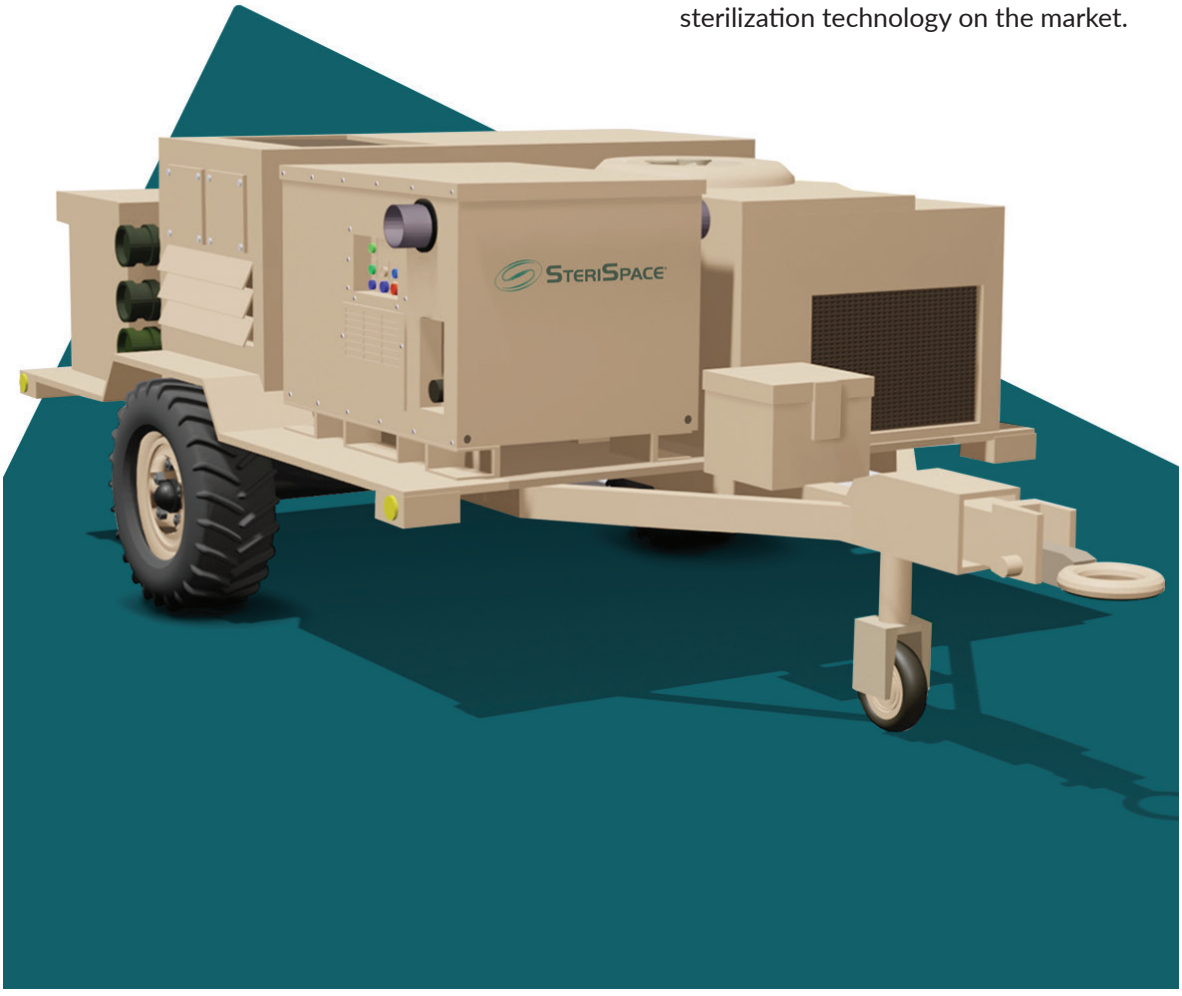
8. Seltzer JM. 1994. Biological contaminants. J Allergy Clin Immunol 94:318-26.
9. Van Leuken J, Swart A, Havelaar A, Van Pul A, Van der Hoek W, Heederik D. 2016. Atmospheric dispersion modelling of bioaerosols that are pathogenic to humans and livestock–A review to inform risk assessment studies. Microbial Risk Analysis 1:19-39.
10. Srikanth P, Sudharsanam S, Steinberg R. 2008. Bio-aerosols in indoor environment: composition, health effects and analysis. Indian J Med Microbiol 26:302-12.
11. Das S, Kataria VK. 2010. Bioterrorism : A Public Health Perspective. Med J Armed Forces India 66:255-60.
12. Tang JW, Li Y, Eames I, Chan PK, Ridgway GL. 2006. Factors involved in the aerosol transmission of infection and control of ventilation in healthcare premises. J Hosp Infect 64:100-14.
13. Pepper IL, Gerba CP. 2015. Aeromicrobiology. Environmental Microbiology doi:10.1016/B978-0-12-394626-3.00005-3:89-110.
14. Gralton J, Tovey E, McLaws ML, Rawlinson WD. 2011. The role of particle size in aerosolised pathogen transmission: a review. J Infect 62:1-13.
15. Bahl P, Doolan C, de Silva C, Chughtai AA, Bourouiba L, MacIntyre CR. 2020. Airborne or droplet precautions for health workers treating COVID-19? J Infect Dis doi:10.1093/infdis/jiaa189.
16. Ager BP, Tickner JA. 1983. THE CONTROL OF MICROBIOLOGICAL HAZARDS ASSOCIATED WITH AIR-CONDITIONING AND VENTILATION SYSTEMS *. The Annals of Occupational Hygiene 27:341-358.
17. Anonymous. 2005. Evaluation of ionic air purifiers for reducing aerosol exposure in confined indoor spaces. Indoor Air 15:235-245.
18. Anonymous. 2005. Air cleaning technologies: an evidence-based analysis. Ont Health Technol Assess Ser 5:1-52.
19. Reed NG. 2010. The history of ultraviolet germicidal irradiation for air disinfection. Public Health Rep 125:15-27.
20. Anonymous. What is a HEPA filter?, on United States Environmental Protection Agency https://www.epa.gov/indoor-air-quality-iaq/what-hepa-filter-1. Accessed January 4.
21. Heumann WL. 1997. Industrial Air Pollution Control Sysytems McGraw Hill Publisherd, Inc., Washington, D.C.
22. Do V. January 4 2017. Pros and Cons of HEPA Filter Air Purifiers, Dissected. Molekule. https://molekule.science/pros-cons-hepa-filter/.
23. Laue M, Kauter A, Hoffmann T, Möller L, Michel J, Nitsche A. 2021. Morphometry of SARS-CoV and SARS-CoV-2 particles in ultrathin plastic sections of infected Vero cell cultures. Sci Rep 11:3515.
24. Kumar S, Saxena SK. 2021. Structural and molecular perspectives of SARS-CoV-2. Methods 195:23-28.
25. Anonymous. 2011. Survival of Microorganisms on HEPA Filters. Applied Biosafety 16:163-166.
26. Zeng Y, Manwatkar P, Laguerre A, Beke M, Kang I, Ali AS, Farmer DK, Gall ET, Heidarinejad M, Stephens B. 2021. Evaluating a commercially available in-duct bipolar ionization device for pollutant removal and potential byproduct formation. Building and Environment 195:107750.
27. Anonymous. Can air cleaning devices that use bipolar ionization, including portable air cleaners and in-duct air cleaners used in HVAC systems, protect me from COVID-19?, on United States Environmental Protective Agency https://www.epa.gov/coronavirus/can-air-cleaning-devices-use-bipolar-ionization-including-portable-air-cleaners-and-duct. Accessed January 4.
28. Sayers JA, Smith RE, Holland RL, Keatinge WR. 1987. Effects of carbon dioxide on mental performance. J Appl Physiol (1985) 63:25-30.
29. Bogdanovica S, Zemitis, J., Bogdanovics, R. . 2020. The Effect of CO2 Concentration on Children's Well-Being during the Process of Learning. MDPI Energies.
30. Offermann FJ, Sextro RG, Fisk WJ, Grimsrud DT, Nazaroff WW, Nero AV, Revzan KL, Yater J. 1985. Control of respirable particles in indoor air with portable air cleaners. Atmospheric Environment (1967) 19:1761-1771.
31. Melandri C, Tarroni G, Prodi V, De Zaiacomo T, Formignani M, Lombardi CC. 1983. Deposition of charged particles in the human airways. Journal of Aerosol Science 14:657-669.
32. Anonymous. 2018. Residential Air Cleaners: A Technology Summary Division EIE, United States Environmental Protection Agency epa.gov. https://www.epa.gov/sites/default/files/2018-07/documents/residential_air_cleaners_-_a_technical_summary_3rd_edition.pdf.
33. Martin Jr. SBea. 2008. Ultraviolet Germicidal Irradiation: Current Best Practices. ASHRAE Journal
34. Byrns G, Barham B, Yang L, Webster K, Rutherford G, Steiner G, Petras D, Scannell M. 2017. The uses and limitations of a hand-held germicidal ultraviolet wand for surface disinfection. J Occup Environ Hyg 14:749-757.
35. Rogers WJ. 2012. 2 - Steam and dry heat sterilization of biomaterials and medical devices, p 20-55. In Lerouge S, Simmons A (ed), Sterilisation of Biomaterials and Medical Devices doi:https://doi.org/10.1533/9780857096265.20. Woodhead Publishing.
36. Sahay R. 2021. Bipolar Ionization and its Contribution to Smart and Safe Buildings. CABA Intelligent Building Council.
37. Anonymous. Results for Aerosol Treatment Technology Evaluation with Cold Plasma Bipolar Ionization Device, on United States Environmental Protection Agency https://www.epa.gov/covid19-research/results-aerosol-treatment-technology-evaluation-cold-plasma-bipolar-ionization. Accessed January 4.

SteriSpace In Action

The GETTS Trailer System

At This Month's CBRNe Convergence Canada Event In Ottawa, SteriSpace Debuted The New GETTS (Generator ECU Trailer Tent SteriSpace) Expeditionary System.

The GETTS turnkey system combines the fastest tent set-up and strike cycles in the industry with the only air sterilization technology on the market.



Connecting with Industry Leaders

Joint Civil & DoD CBRN Symposium in National Harbor, MD

This event provided members of the DoD, Federal Government, State and Local Government, Private Industry, Academia, and other relevant CBRN stakeholders to discuss the latest updates in advancing a government wide approach to improving CBRN defense, readiness and response strategies and capabilities.

AUSA 2021 Meeting & Exposition in Washington D.C

This event largest land power exposition and professional development forum in North America and draws more than 30,000 attendees and 650+ exhibitors. This gave our team the ability to meet with some of the premier shelter manufacturers and build buzz about the SteriSpace technology within the US military.

IAQA 2022 Annual Meeting & Expo

Our team had the privilege to present SteriSpace's many applications as an indoor air quality solution. This event also provided a great opportunity to network with industry experts and provided a chance to learn more about other technologies through exhibitors.

CBRNe Convergence in Ottawa, Canada

Our team was co-exhibitors with Eureka!, allowing for many connections with other bright minds in the CBRN industry. With over 40 exhibitors and 25 guest speakers, the two-day conference gave our team unique insights into the world of CBRNe defense.

MATRA Tent Show

This was a great chance to meet the brightest minds in the tent manufacturing and rental industry, and we made some great connections including Erueka! Military Tents.

SteriSpace News

You First Services Partners With Camel Expeditionary

Sterispace Air Sterilization Technology Integrated Into Military Shelter Systems

Partnership with tent manufacturer intended to revolutionize air handling systems for rapid deployment shelters in the U.S. armed forces.

SteriSpace & Eureka!

SteriSpace working with Eureka! Develop a Ground-based Turnkey System

Our SteriSpace team is partnering with Eureka! Expeditionary Systems to adapt our an all-in-one, GETTS system for ground-based military shelter environments.

Geofencing as a Digital Marketing Strategy for YFS

Geofencing – What You Need to Know

Geofencing is a commonly used ad tactic that targets an audience based on their location, as opposed to the type of content that they engage with. This means that if someone goes to the location you're targeting within a specific range of time, that person will be eligible to be served your ads.

Once someone is served an ad, they become a part of that target audience even when they're no longer in the geofencing range. For business-to-consumer marketing (B2C), geofencing can increase foot traffic for any brick-and-mortar store. For business-to-business (B2B), it can increase website traffic and leads and ideally lead to sales conversions. Overall, geofencing contributes to a well-developed inbound marketing strategy.

The Advantages of Using Geofencing

More than 50% of consumers visit stores after receiving location-based ads, according to Salesforce. This shows us that the more targeted an ad is, the more impactful it will be on your audience. Location-based targeting helps by gathering crucial information on your audience. Learning where your audience goes, what ads work with them and where, as well as what keywords resonate with them is crucial to an effective geofencing strategy.

Geofencing is easy to implement and its targeting frequency can have a powerful influence on buying decisions. The more a message is kept in front of an audience, the more likely it is to resonate with them and drive them to purchase.

Creating an Effective Geofencing Marketing Strategy

Crafting an effective geofencing strategy involves a number of factors. In order to determine your target market, you should be considering who you're trying to reach, what industry you want sales conversions from, and who the primary stakeholders are in that industry. Incorporating these elements into your geofencing strategy will allow you to adjust your tactics accordingly and maximize your ad's impact.

Determining the location of your markets is another key piece of a successful geofencing strategy. If the stakeholder you're trying to reach is in a specific building location such as a business office's headquarters, you'll want to ensure that you're targeting that exact address. Additionally, when targeting your desired location be sure that you are not overlapping your locations, as this can cause you to bid against yourself and waste money.

Using Geofencing for YFS

Geofencing is an essential part of a highly effective marketing strategy as it gives you a competitive advantage when targeting your audience. Using this location-based marketing tactic will help you reach your target audience much more efficiently while helping you to gather important data on your audience.

You First Services, Inc. is using geofencing in all aspects of our marketing efforts on top of all other inbound marketing tactics.

Glotran Making Strides

Welcome Dr. Deliberato, DDS

Dr. Deliberato joins our GloTran team as our latest key opinion leader.

As a part of our team, Dr. Deliberto will present and highlight YFS products during in-person and virtual education course to dental professionals. Dr. Deliberato will also support our sales and marketing efforts through digital and written testimonials, discussing our technology and his planned uses for our products in professional settings.

Dr. Deliberato is a prosthodontist in Westlake, Ohio. He provides advice on proper dental prosthetics, such as crowns and bridges.

> **"Our favorite feature of GloTran is its ability to disinfect a variety of items in a way that reduces staff time and is effective and thorough."**
>
> *Dr. Deliberato*

GloTran Awarded Contract by General Services Administration (GSA)

The five-year medical equipment and supplies contract allows federal customers easily to purchase GloTran to help VA hospitals prevent Hospital-Acquired Infections (HAIs).

GloTran Sponsoring Roe Dental Laboratory Event

This June, GloTran will both sponsor and attend the Roe Dental's Teeth Today CE course, featuring GloTran key opinion leader Dr. Anthony Deliberato as an course instructor .

Lubricity and MetaQil Gaining Momentum

Easy Accessibility for Our Valued Customers Find Us in Tops Friendly Markets

Lubricity and MetaQil are now readily available at 75 Tops Friendly Markets locations for consumers who have health needs or concerns that include dry mouth or an altered taste.

Lubricity & MetaQil Now Available at ECMC

Starting officially on April 18, YFS products are now on display and available in ECMC's dental clinic. YFS intends to work closely with the ECMCC staff to support patients in different hospital departments, including dental, speech pathology, and oncology.

Get to Know Your Customer Day

In January, to celebrate Get to Know Your Customer Day, Lubricity and MetaQil hosted a giveaway was for returning customers to share their experience with the product. We received many amazing reviews from customers and have been incorporating them into several different marketing strategies.

Lubricity Review:

"After having radiation treatment for oral cancer I experienced extreme dry mouth and tried many different OTC products. Lubricity has been the only product that allows me to sleep through the night without having to repeat the application. My dentist recommended trying it and I couldn't be more grateful that he suggested it!!! I'm def a huge fan!"

-Carol, Jan. 2021

MetaQil Review:

"I have used MetaQil for almost 2 years now. I have been to six different doctors for a terrible taste in my mouth and no one has been able to help me. MetaQil is the only product that works for me. It's the only thing that keeps me sane on a daily basis."

-Kimberly, Jan. 2021

Welcome New Employees

Nicholas Liberati
Pharma Operations Manager

Joe Healy
Inside Sales Representive
Sterilization & Disinfection

Ken Moulin
Product Specialist
Sterilization & Disinfection

James Cashatt
Purchasing Agent

Randy Coons
Account Manager

Nachiket Aradhye
Mechanical Engineer

Xuan Lin
Jr. *Mechanical Engineer*

Mitchell Kucia
Inside Sales Representive
Oral Health Care

James Stoyle
Sr. Electrical Engineer