

A light at the end of the tunnel?

We are all looking forward to life getting back to some kind of normal, but the reality for those responsible for safety and wellbeing will be anything but. As those in the public safety sphere try to keep up with virus variants, seasonal changes, vaccine supply and take-up and the natural tendency for people to relax their own social distancing and hygiene measures, they will still be prioritising health and safety.

While the roll out of vaccination programmes is moving ahead around the world, we have already seen the arrival of different variants with greater transmission rates that may require existing vaccines to be tweaked to maintain effectiveness.

It is clear that we are going to have to live with this pandemic for the foreseeable future, but if we have learnt one thing, it is that human beings are social. Whether at work or play, how we prevent further outbreaks is a cause of concern not only because of the economic impact, but also for the state of our mental health.

Over the past year, Optimal Risk has been investigating the safest ways for people to return to work and play as part of its risk planning. Out of all the safety and hygiene systems the organisation looked at, such as ultra-violet light, deep cleans, vaporised cleaners with volatile organic compounds (VOCs) and antimicrobial metals and coatings, a US system called Synexis stood out for the simple and effective way it works around the clock to kill all bacteria and microbes in the air and upon surfaces.

It was originally introduced to counter epidemic and pandemic bioterrorism and developed over many years by scientist and former US Army Major, Jim Lee. During 2020, it has been demonstrating its value and effectiveness in combatting Covid-19 and was really put to the test when Tom Brady gained his seventh Super Bowl victory and led the Tampa Bay Buccaneers to their 31-9 win over the Kansas City Chiefs in February this year.

The organisers at Tampa Bay did everything they could to ensure a safe Superbowl Final and fears that it could become a superspreader event were unfounded.

Last year, both teams were looking to reduce the levels of bacteria and viruses in the air and on surfaces within their indoor environments. So they installed the Synexis Biodefense System in their training facilities and stadium. Major league baseball teams, including the Tampa Bay Rays and LA Dodgers, are also using this technology. Field trial data from the latter revealed the effect that Synexis can have on workplace health. Comparing the year 2019 against a three-year average showed a 40 per cent reduction in all illnesses, a 95 per cent reduction in days missed owing to all illnesses and a 77 per cent reduction in written prescriptions. Its versatility is so appealing that many players have it installed in their homes and many of the teams take the system with them when travelling.

Elsewhere, not one Covid-19 case has been reported on more than 75 offshore oil and gas platforms where Synexis has been installed.

The Synexis technology is patented and works by creating the gas form of hydrogen peroxide, a natural substance produced by the human body, from ambient oxygen and humidity. This is known as dry hydrogen peroxide (DHP). All microbes require water from the environment to survive and, as the DHP molecule is similar in structure to water, the microbes attach themselves to it. The DHP then breaks down the microbe's outer cell membrane, which effectively destroys it.

The system ensures the DHP flows in the air throughout buildings and settles on all the furthest surfaces. It has no adverse effect on plants or electrical equipment, including smoke detectors. Most importantly, DHP is non-toxic, green, has no effect on food and drinks and is incredibly safe for humans and animals. The USA's Occupational Health and Safety

Administration's current regulations allow for exposure to hydrogen peroxide at one part per million over a 40-hour week. The Synexis system produces a maximum of five to 25 parts per billion; this is 1,000 times less than the maximum exposure.

The system operates effectively between 15 and 95 per cent humidity. Healthy indoor humidity levels are between 30 to 60 per cent. This means it can be a continuous presence; it helps to reduce mould, bacteria and yeast and it kills insects as well.

The systems are bespoke and designed using floor plans to work out what is needed and where. The units come in stand-alone plug and play versions or as a 'blade' that can be easily fitted into existing air conditioning systems and can be used in any indoor location – even private homes.

During the SARS outbreak, a major financial institution in the Far East brought in teams to work around the clock to clean every flat surface, handrail, banister and door grip. It found that with the additional cleaning, the normal absentee rate owing to minor illness was halved from two per cent of the workforce to one per cent. However, the constant interruptions to work and the ongoing daily costs of the extra personnel became a real issue. In contrast, Synexis is easy to use. The units have an estimated lifespan of ten years, operational costs are low and there is very little disruption to normal routine. The DHP also gets into places that regular cleaning cannot reach. The bigger the space, the more cost effective it becomes in terms of cleaning staff and other precautions.

Synexis works best in closed environments, but recent tests show that even with windows open, the air is still being changed and it is effective in killing microbes. It is already being successfully installed in hospitals, restaurants, major league sports venues, food production facilities, casinos, hotels, schools, daycare centres, office buildings, retail stores, places of worship, residential blocks and animal hospitals. The town of Vail in Colorado is currently installing the system in all of its municipal buildings.

Flexible system

The system is flexible. Hotel operators, for example, have the choice of fitting standalone systems or relying on current deep clean protocols for the bedrooms and just installing Synexis in the public areas within the air conditioning system. Either way, guests will be immersed in DHP when they come out of their rooms into hallways and other public areas, which will reduce the risk of cross-contamination when they mingle.

Research is now under way to see how to incorporate Synexis into aircraft and other mass transport systems – especially on buses, trains and underground networks that have closed environments.

Even in difficult environments such as NGO field operations, utilising this system in a closed area will ensure that the DHP will kill off any virus microbes on someone entering the building.

All the early indications are that systems like this operating in the background will have to become the norm, even in private homes. Used in conjunction with existing precautions, people can be confident that the environment will be as safe as possible. It has the potential to be a long-term solution to fears over subsequent pandemics – which we will inevitably face.

This is an exciting development, the only requirement being that everyone goes about their normal business. The system is unobtrusive, cost effective, safe and most importantly – it works. 

Author



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Mike O'Neill describes a technology developed in the USA – with its origins in US Army biowarfare labs – that is yielding excellent results in preventing Covid-19 transmission in occupied spaces and which could become a global standard