Supplementary air filtration systems, such as these specialized purifiers from SCA, can work in tandem with existing resources to boost air quality. Photo Credit: Surgically Clean Air

What's on the Air? COVID Necessitates Better Purification for Healthcare Venues

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By Marshal Sterio

We often think of buildings, especially major projects like hospitals, as being created ready to serve their purpose forever. But as futurist Stewart Brand said, "buildings learn over time as they adapt to their real-world uses." This is by no means a slight directed at builders and architects, but rather an acknowledgement that there is no perfect way to design and construct a building that will remain unchanged for eternity. Even Paris's timeless Louvre now sports its glass pyramid — not to mention air conditioning and disabled access. But not all of these evolutionary steps are visible to the public, and one of the biggest changes that takes place behind closed doors is the augmentation of ventilation systems, which has become especially important in the era of the COVID-19 pandemic.

Air quality is far more important in healthcare facilities than just about any other kind of building. If an office is a little stuffy, it's uncomfortable. But significant problems can arise if a medical center doesn't have proper ventilation. It's no accident that the earliest tuberculosis hospitals built in the United States (such as in New York City's East Side and on nearby Roosevelt Island) featured large windows and narrow profiles to maximize airflow. These structures long preceded modern HVAC systems, but the same principle that guided architects in the 18th and 19th centuries remains unchanged: fresh air keeps patients and medical professionals healthy.

Modern ventilation systems do an amazing job of keeping buildings in the proper temperature range, and they include sophisticated filtration systems that keep air clean.

Unfortunately, that's not always good enough – for example, outbreaks of Legionnaires Disease, a particularly virulent pneumonia infection, are often traced to the very systems that were designed to purify the air in large buildings. That's because cooling towers used in many HVAC systems can actually harbor harmful microbes.

Today we are dealing with a disease that makes these problems with air filtration especially important: COVID-19 can live on tiny particulates in the air for hours. These particulates are too small for a standard HVAC system to filter, and since hospitals are where people with COVID-19 go for treatment, without proper air filtration your standard hospital is filled with coronavirus-laden particles. Previously, well-enforced universal masking mandates made hospitals relatively safe, but the rise of the more infectious Omicron Variant has rendered most masks less effective (if still useful.) And with people refusing necessary procedures for fear of COVID exposure, hospitals must up their game in cleaning harmful particulates from the air.

Standard climate control systems can harbor dangerous microorganisms like COVID-19, but getting rid of heating and air conditioning isn't really an option. So what is the best way for healthcare facilities to take advantage of their existing ventilation resources while also maximizing safety and comfort? The answer is supplemental air filtration systems that work in conjunction with existing equipment. These specialized purifiers can scour the air in an enclosed space and clean the tiniest particles and particulates of any microbes, making the air inside a facility clean enough for any sort of medical procedure and ensuring the safety of patients and hospital staff alike. When installed correctly, these devices can ensure that any building's air supply is clear of dangerous microbes, helping people feel safe visiting the hospital, even in times like these.

The trick, of course, is figuring out exactly what each facility needs. In some cases, a very small filtration system is more than adequate to improve air quality. A local dental office doesn't need to invest hundreds of thousands of dollars in a massive supplementary air system when a portable system with robust technology can be purchased for a fraction of that cost. On the other hand, a series of tiny air filters scattered throughout a public medical facility isn't really going to make a difference. Unfortunately, most of us have walked into doctors' offices to see exactly that approach in play, and while it may make people feel marginally better about the air quality, those devices simply don't move enough air to be effective. Bigger facilities simply require more robust air filtration.

It's also important to consider factors like power usage, size, and noise. A lot of supplemental air systems can be incredibly loud, which is fine for places like health clubs and arenas but not ideal for patients receiving care. They can also be bulky, which can create problems in tight spaces such as MRI labs. Savvy operators of healthcare facilities need to weigh the need for clean air against noise and space considerations. Since patient wellness is a premium, hospital directors must instill proper filtration without making a hospital stay more stressful for patients, and may even want to consider retrofitting to incorporate stronger filters into hospital infrastructure.

If this sounds like overkill, consider that just about every other system in a modern hospital or medical office – from entry doors to gurneys – have been modified or improved over time. Again, this is no criticism of the original teams who designed and built our medical centers.

It's simply that over the course of many years or decades, technology improves, needs change, and buildings that are meant to remain in use must adapt these technologies to fill these needs. For example, most older hospitals did not have wheelchair ramps, but the advent of the Americans with Disabilities Act (ADA) forced medical facilities to modify their existing amenities.

Ventilation is just another upgrade in a never-ending list that grows as technology and challenges evolve, and we cannot plan our buildings for every eventuality. The next generation of hospitals will likely include advanced air-filtration systems, but will still need a round of upgrades for whatever public health, economic, or social changes require after these hospitals are built. By taking swift action and installing high-powered air filtration, hospitals can face down this pandemic-era problem, and be ready for the next challenge the world throws our way.

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