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HEALTHIER BUILDINGS FOR PATIENTS AND PROVIDERS



The COVID-19 pandemic has forced us to look at the world through fresh eyes – and question our preconceptions. Shoppers, office workers and patients who previously walked past hand sanitizers without a second glance started queuing to clean their hands, all the while wondering what lingered in the air about them.

Nowhere was this more evident than in healthcare environments. Finding themselves on the front line, healthcare organizations had to deploy extraordinary sanitary measures and implement functional changes to convert non-clinical space into desperately needed treatment areas, without compromising safety, security or operational throughput. This wasn't a simple case of rolling in beds and medical procedure carts. Facilities had to examine their building controls for the sake of patients and staff alike from air sanitization and ultraviolet pathogen control, to negative pressure containment and antimicrobial solutions.

The success healthcare facilities management organizations have had in addressing the outbreak is admirable – and a testament to the critical role healthier facilities play in delivering positive patient outcomes. Healthier buildings complement the work done within them, use data to optimize individual processes, deliver financial savings, and potentially even help save lives.

To meet this type of occasion, healthcare facilities properly equipped.

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NEW SOLUTIONS TO OLD PROBLEMS

The Spanish flu pandemic of 1918 to 1919 killed upwards of 50 million people, with the most pessimistic estimates capping the number of deaths at 300 million.

"Put simply, medics found that severely ill flu patients nursed outdoors recovered

better than those treated indoors," wrote Dr Richard Hobday of learnings from the 1918 pandemic. "A combination of fresh air and sunlight seems to have prevented deaths among patients; and infections among medical staff."

A similar focus on fresh air is still relevant today. Adjusting HVAC (heating, ventilation and air conditioning) systems to pull in more fresh air, improve ventilation and filtration, manage temperature, humidity, Co₂, and implementing pressure strategies can help improve indoor air quality. Adding UV technology can further enhance air quality as it has similar germicidal properties to sunlight.¹

Research by Honeywell found that 56% of workers² recognized the increased danger of airborne transmission of pathogens, and more than two fifths believed that buildings with outdated ventilation systems were more dangerous even than co-workers not following safety guidelines.

With 51% of employees surveyed by PWC stating that they would not return to work if they feared getting sick as a result, it is important to consider these factors for healthcare facilities. Efficient air exchange reduces chemicals, cuts levels of carbon dioxide, and avoids recycling inanimate particulates in the air. This can create a safer environment and when used in concert with filters and pressure control can help isolate designated areas.

MONITORING AIR SAFETY, IMPROVING AIR QUALITY

HVAC systems with UV air cleaning technologies play a key role in providing the right quality of conditioned air as well as removing hazardous contaminants in the air in critical care areas of the hospital. In addition, HVAC systems, generally, that service a whole building can be ineffective if they are not reliably optimized to follow guidelines set by organizations like the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) or Federation of European Heating, Ventilation

and Air Conditioning Associations (REHVA). For example, traditional variable air volume (VAV) terminal units are not an effective solution to provide reliable, directional flow. They are inconsistent and too hard to control with any degree of accuracy and their effectiveness over time can be reduced by debris that accumulates on their transducers. Precision airflow control is therefore a must, which is why hospitals, life science centers and research institutions are using products like the [Phoenix Controls Venturi Valve System](#) to more efficiently and precisely manage airflow in critical environments. In a healthcare setting, the venturian control and stabilize the air supply while maintaining exhaust, tracking the feed to guarantee an offset and provide directional flow. This allows for the creation of both positive and negative pressure spaces, with easy switching from neutral pressure when required, which can aid in the process of establishing and fitting out temporary isolation rooms and treatment areas and providing greater room-state flexibility which allows for areas to be rapidly repurposed to address other needs of the facility and increased flow of patients.

A [2019 study](#) by the Center for Health Design concluded that using Venturi control systems reduced the amount of contaminants passing from areas.

Combining accurate air flow controls with electronic air cleaners further demonstrates a building administrator's commitment to site safety and can help minimize risk.

BUILDING AND FACILITIES MAINTENANCE

Infection prevention and control is one of a healthcare organizations primary responsibilities and concerns. Yet the cost of keeping facilities clean must be balanced with the needs of those who directly interact with patients and require beds, machinery, drugs and consumables. Efficient systems for maintaining hygiene are therefore essential and implementing them can help reduce the need for the Environmental Services team to work in bio-secure areas, which can pose a risk to their own health and be disruptive to the treatment being delivered.

"Keeping hospitals clean is not just an aesthetic, but a patient safety issue," noted the [Healthcare Cleaning Forum](#).³⁴ Hospital environmental hygiene is complex because it is dependent on the pathogen present and the product used to remove it."

This is one area in which prevention is better than cure: avoiding the build-up of pathogens reduces the likelihood of facilities being taken out of use for deep cleaning and, frequently, this can be achieved through the permanent installation of passive cleaning systems using ultraviolet energy. UVC is a surface disinfection tool, which can help prevent or destroy viral, bacterial and fungal organisms.⁴

Systems come in a range of sizes. UV-C disinfection solutions that bathe an environment in ultraviolet light are capable of neutralizing viruses and bacteria within a specific area⁵. More focused disinfection is similarly available using UV battens, sanitization kits and UVC chambers which sanitize smaller medical implements by exposing them to ultraviolet light for an extended period.

Honeywell

Hello!
We are monitoring this building for
your safety and comfort!


Occupancy Level

● <45%


Temperature

● 72°F


Humidity

● 42%

SAFETY MEASURES IN THIS BUILDING


Temperature Screening


Video Analytics


Contact Tracing

HELP PREVENT THE SPREAD


Wear mask & maintain safe 6ft distance


Wash your hands frequently


Safety helpline
904-633-6114



Honeyw



INTELLIGENT ASSET TRACKING

Every asset matters in a healthcare organization. It's important to constantly review if an asset remains fit for purpose and continues to play its part in delivering positive clinical outcomes.

Centralizing the control and monitoring of assets and building systems through a unified user interface or dashboard simplifies this task, while also allowing stakeholders to identify issues before they become problems. Dashboards similarly enable the use of integrated real-time location systems (RTLS) to track both physical assets and people.

RTLS, which uses a range of radio frequency communications, beacons, and acoustic and optical sensors to gather live metrics, is key to reducing operational inefficiencies in a healthcare environment. It does this by building on traditional asset protection systems to include contact tracing, tracking wandering patients, identifying where incidents are initiated using automated camera and map call up and related functions. Sensors and video analytics can even detect whether a building's occupants are wearing masks and complying with social distancing regulations.

By providing a single, integrated system to help manage critical incidents, RTLS can improve response times for a better patient outcome, guide incident response, and track actions for post-incident analysis.

Integrating RTLS systems into the building management system can provide a single point of focus for the live management of systems, assets, patients and staff across the clinical estate. Detailed plans of individual floors provide better situational awareness, quicker analysis and more efficient operations, while delivering real-time alerts to building owners and operators.

Naturally, where information and control is focused on a single point, as in a dashboard, it must be designed in such a way that it's secure at the point of implementation — and remains secure as the system grows and evolves.

SECURITY: BOTH DIGITAL AND PHYSICAL

RTLS and related technologies are thus a key tool when it comes to securing sensitive areas within a healthcare environment. Their use can restrict access to sensitive areas, like operating theaters and recovery rooms, as well as securing pharmaceutical supplies, drugs and radiological material.

It is imperative, however, that such measures don't impede the movements of authorized staff. Biometric gatekeeper options, like IDEMIA MorphoWave address this issue. They can regulate access to sensitive areas and deliver identity confirmation in less than one second per user, while maintaining the flow of authorized personnel to provide approved access to any area in a timely manner.

Centralized access controls like MorphoWave are a key component in the architecture of connected hospitals, as they can be extended both quickly and easily by installing the biometric readers wherever they're required. Reading from the same unified database reduces the cost and complexity of installation, while the use of biometrics as an alternative to card- or tag-based pass can enhance security. Staff will no longer be locked out should they lose their access device, potentially putting patients at risk and lost cards are no longer a vulnerability that could grant access to unauthorized users.

For reasons such as these, connected hospitals are better equipped to address critical healthcare outcomes — both now and in the future — as they benefit from an agile infrastructure that extends core services across an entire healthcare campus. Non-

treatment areas can be rapidly reconfigured to cope with unpredictable clinical demands

Naturally, extending digital infrastructure this way also requires that the systems on which connected hospitals rely are hardened against an increased range of cyber threats and, where physical connections traverse both bio-secure and non-clinical areas, intelligent choices must be made. For instance, ducts, cabling and other hardware should be constructed with modernization in mind. Outlets and cables should be ISO 22196:2011 compliant and, wherever possible, infrastructure and surfaces should be scratch resistant, to avoid the build-up of bacteria and dirt.

FIRE SAFETY

Helping patients, staff, and visitors stay safe from fire and life safety events is important for healthcare facilities and is especially important for patients who may be incapacitated, or highly vulnerable, reducing their mobility and ability to react.

When a fire event occurs, an integrated system can provide crucial early warning to allow local control and mitigation. The priority is early and reliable detection and verification, avoiding the need to evacuate the building and create patient disruption. These systems also support the detection of other threats like oxygen and toxic gas leaks.

A good fire safety system can also stop false or nuisance alarms, preventing unnecessary panic and disruption that, in turn, affects patient trust and confidence.

Beyond detection and prevention, public address and voice alarm solutions can indicate, confirm, and communicate emergencies of all kinds, providing a service that extends beyond fire safety. Response instructions can be pre-recorded, or they can be communicated in real time by first responders – allowing patients, staff and visitors to receive clear and concise information at the right time.

HEALTHCARE AND HEALTHY BUILDINGS

Hospitals are designed as places of clinical care but without adequate sanitation, monitoring and management, they have the potential to become vectors of infection themselves.

Every day the world is better positioned to fight the latest pandemic, having the tools to effectively control environmental factors such as air flow and humidity and to design or retrofit healthier buildings, all of which can contribute to positive outcomes.

Measures like patient and asset tracking, access control to critical clinical environments and compartmentalized airflow management systems, deliver ongoing protection – while centralized monitoring and control dashboards present a unified view of the healthcare estate.

The result is a safer working environment for clinicians and support staff, and a positive patient experience.

NOTE:

The rollout of vaccines is already having a quantifiable impact on the spread of coronavirus, we can't afford to be complacent. The next pandemic could be just around the corner – and it may be even more virulent. Clearly, the advances we have made since the flu pandemic of 1918 have reduced the impact on our world but, as a species, we're still learning. Companies like Honeywell will continue to innovate new solutions and technologies, making buildings healthier, more comfortable and safer places to live, work and receive medical treatment.

1 Government of Canada, [What is Ultraviolet Radiation?](#), Modified 2017-11-07 [Accessed September 11, 2020]

2 Honeywell study [surveyed 2,000 workers](#) that typically work in buildings with 500 or more employees across the United States, United Kingdom, Germany and the Middle East.

3 Peters, A., Otter, J., Moldovan, A. et al. [Keeping hospitals clean and safe without breaking the bank: summary of the Healthcare Cleaning Forum 2018](#). Antimicrobe Resist Infect Control 7, 132 (2018).

4 U.S. Food and Drug Administration, [UV Lights and Lamps: Ultraviolet-C Radiation, Disinfection, and Coronavirus](#). Updated February 1, 2021 [Accessed July 8, 2021]

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WE
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Technologies**

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