

# OpenBlue

## Healthy Buildings

## Safe space: This AI preps hospital rooms, allowing busy clinicians to focus on their patients

The average hospital calls on a wide cast of clinicians when providing critical healthcare to their sickest patients. Doctors, nurses, care technicians and their assistants all play a big role in treating inpatients, who are often confined to their beds. But there is another protagonist that can positively influence patient outcomes: the room itself.

Take a code blue medical event, when a patient suffers an emergency such as cardiac or respiratory arrest, a stroke or a sudden drop in blood pressure. Clinicians rely on excellent light, good ventilation, privacy and minimal background noise to assist their lifesaving efforts, which often include intubation, chest compressions, and defibrillation. But responders can lose valuable time preparing the room, whether it's turning up the lights, boosting the airflow, rolling down the blinds, or scrabbling for the TV's off button. That's time they can't afford, because if medical intervention doesn't begin within several minutes of a code blue, it could be too late.

That's why Johnson Controls has developed technology that uses an advanced network of digital controls to automatically alert clinicians during code blue events, direct them to the room, and prepare the clinical environment. This ensures that clinicians arrive on the emergency scene as quickly as possible and frees them up to fully focus on saving the patient's life as soon as they walk through the door. Clinicians have welcomed the technology, saying that they are likely to be more focused, prepared and calm when they arrive at the scene of a code blue if they don't have to worry about the room environment.

Similar automated technology can also alleviate the workload on nurses and environmental services staff who are shuttling between hospital rooms providing routine inpatient care. Johnson Controls is rolling out software that allows patients



to control their room environment without moving an inch. OpenBlue Patient Room Optimization harnesses virtual assistant artificial intelligence (AI) technology and mobile apps, which allow patients confined to their beds to safely adjust their room's temperature, lighting and media with a simple voice command or swipe of their finger. The technology should prove popular with healthcare providers, who are increasingly keen to provide amenity-rich environments that anticipate a patient's needs to provide an optimal patient experience.

The term "code blue" was coined in the Bethany Medical Center in Kansas City, Kansas, in the early 1990s and is now a common term in English-speaking countries. Most of the world's major hospitals have some sort of procedure to alert hospital staff to medical emergencies, such as cardiopulmonary arrests. These arrests are an everyday occurrence in tertiary or quaternary care facilities, which usually offer specialized consultative treatment for cardiac, cancer and neurosurgery inpatients, and regularly carry out medical and surgical interventions. Cardiopulmonary

arrests are also a high risk for patients who are critically ill with COVID-19. Many hospitals saw inpatient numbers soar during the worst weeks of the COVID-19 pandemic, with many people critically ill and requiring intensive care.

In such cases, the Code Blue system is the resuscitator's invisible ally. The system leverages real-time location services (RTLS) and mobile device alerts to ring and flash up notifications on hallway displays, staff phones and nurse call systems. While notifying the nearest qualified responders, it triggers overhead signage to help them find their way to the room. It can also call and hold elevators, if a clinic is arranged over several stories. The system then automatically prepares the room. This can involve pre-cooling the space, upping airflow in anticipation of additional staff, setting light levels, and closing outside blinds.

The result is that clinicians aren't rushing into a hot, dark or chaotic environment and wasting time on room adjustments such as hunting for a TV remote or turning up the HVAC - they can begin resuscitation immediately. Those seconds might make all the difference, as the faster and more efficiently that doctors and nurses can administer critical care, the higher the chances of the patient's survival.

The system also displays critical patient information, such as patient height, weight, any new medications and dosing instructions, on a digital whiteboard. Clinicians agree that better communication would save time, contribute to better patient outcomes, and reduce medical errors during busy periods.

The same principles are hardwired into Patient Room, which allows patients to control their surroundings such as temperature, lighting and media by voice or by app safely from their beds. This decreases the risk of falls, injury and wandering, and allows them to focus on their priority: getting well. Clinicians have welcomed the ability of Patient Room to pre-select patient room settings prior to hospital admission. For example, an expectant mother arriving for a Cesarean section procedure, one of the most common major surgeries, would already have established her lighting, temperature and sound preferences during a prenatal visit.

Patient Room should also help boost the efficiency and job satisfaction of nurses. The majority of beds at the average city hospital are occupied by non-critical inpatients, which means that caregivers are in perpetual motion. But with adjustments

to temperature, lighting and media either automated or in the patient's own hands, or their family's, staff can stay focused on what matters most: the clinical aspects of care.

This is crucial for many healthcare organizations, who have been seeking to improve engagement and satisfaction among their clinicians and other care providers and renew the sense their work is rewarding during COVID-19 and beyond. Even before the pandemic, [as many as half](#) of the country's doctors and nurses were reporting substantial "burnout" symptoms. Patient Room technology reduces rework and non-critical task redundancy, which can contribute to improved clinician experiences, which in turn can provide improved patient experiences. These Patient Room benefits can help an entire facility boost its performance in publicly reported patient satisfaction surveys, such as [HCAHPS](#).

The system is also in tune with many clinics and systems that are now looking beyond HCAHPS to measure their real-time operational efficiency and predict future performance. Several hospitals are now collecting mountains of data in real time about patient experiences across their facilities. These touchpoints allow them to monitor the patient experience everywhere from the emergency department to retail in the hospital pharmacy. Some hospitals are gathering hundreds of thousands of responses per year. The objective is to find effective "leading indicators," or precursors of things to come, that allow them to fine-tune the future patient experience.

Senior hospital managers say that Code Blue and Patient Room provide an edge when developing and fine-tuning this future patient experience. That's because Johnson Controls is a specialized technology firm with a healthcare focus, with deep experience producing a range of purpose-built apps for cloud-based platforms. Johnson Controls has also ensured that both applications, which are low-voltage products, are easy to integrate with existing in-room services, helping the organization manage costs while providing improved high functionality.

It won't be long before these apps are lightening the load on clinicians, boosting patient comfort and improving outcomes in hospitals across the country. As several healthcare providers have noted, the systems are a glimpse of the hospital of the future. OpenBlue Patient Room Optimization and OpenBlue Code Blue brings the hospital of the future into reality - today.