

Healthcare Campus Smartphone Apps

Access to and control over many of the patient and visitor-accessible systems in “smart hospitals” should be supported by an app on the patient’s or visitor’s smartphone. An overall unifying platform that incorporates the clinical portal (such as Epic’s MyChart app) with other comfort and control applications will provide enhanced patient and family member engagement.



As smartphone usage continues to proliferate, providing an overall umbrella app that provides access to clinical information, patient-controlled hospital systems, and other amenities and services becomes a must-have for “smart hospitals.”

—PHIL CROMPTON, PARTNER

NEED

As new technologies and systems are deployed in the next generation of smart hospitals, providing multiple ways for patients and visitors to interact, control, and respond to these technologies becomes more important. Smartphone apps are becoming more prevalent and accepted as we use them to order food, arrange transportation, control our environment, and provide other quality of life improvements. A new smart hospital building should have a complementing smartphone-based app that provides access to the various technologies.

BENEFIT

Patient and family member satisfaction will increase as visitors to the hospital can interact with its technologies using their own device, providing a level of comfort and familiarity. Staff satisfaction will increase as patients and visitors become more self-sufficient and rely less on staff to support their needs, while they are also able to access the app and take advantage of its capabilities.

RISK

Not every patient and visitor will want to, or be able to, use the app. Alternative methods of interacting with the building technologies (where appropriate) will be required. These may include interactive digital signage and information kiosks, integration with the patient room television system, and providing volunteer and staff assistance.

Value



Staff Satisfaction



Patient Engagement



Clinical Outcomes



Risk



Intelligent Safety and Security

The next generation of campus video surveillance systems augment existing system capabilities with analytics and machine learning capabilities that offer additional safety and workflow improvements.



As the quantity of security cameras increases, the ability of security staff to actively monitor those cameras exponentially reduces. The use of machine-learning systems to review all camera feeds 24/7 increases campus safety and allows the camera system to be used proactively rather than forensically.

—ALEXIS FULLER, SENIOR STRATEGIC CONSULTANT

NEED

Video surveillance systems augmented with analytics and other workflow-support machine learning applications provide additional functionality and improve staff and patient safety on a campus. These systems can be configured to detect predetermined scenarios and alert security staff to potential issues so they can be proactively addressed.

BENEFIT

Analytics and machine learning systems enhance staff, patient, family, and visitor safety by providing continuous monitoring of all camera feeds throughout the hospital and alerting security staff to any detected situations. Staff satisfaction will improve as a result of the improved safety measures being provided, while the additional analytics and machine learning systems will provide workflow improvements that automate low-value tasks and manual reporting.

RISK

Industry-wide concerns regarding facial recognition include accuracy (the technology has not historically been 100% accurate) and diversity (the technology has shown inherent biases with ethnicity, race, and age) perspectives. In addition, facial recognition tends to generate “Big Brother” concerns for staff. This technology is improving and should continue to be monitored.

Value



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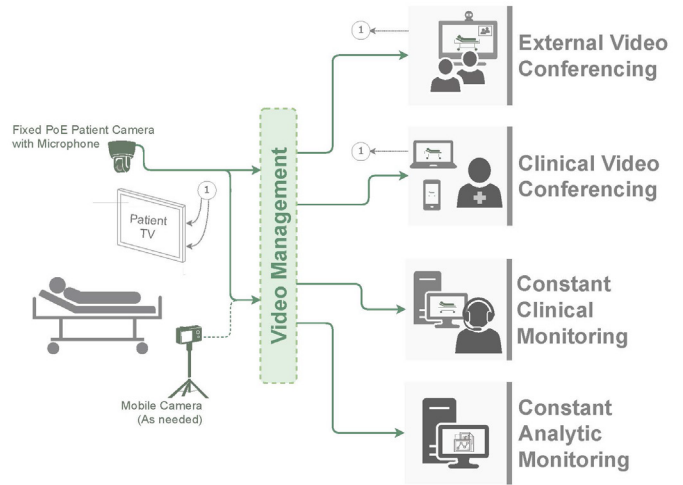


Risk



Patient Room Cameras

A multi-function camera in every patient room provides integrated telehealth between staff and patients and video visiting with family members while improving patient safety and staff workflows using artificial intelligence (AI) and machine learning systems.



As cameras become integrated with AI systems, support for clinical/patient safety monitoring increases in promising ways and results in tangible safety benefits for both patients and staff.

—ALEXIS FULLER, SENIOR STRATEGIC CONSULTANT

NEED

Health care delivery is increasingly incorporating communication beyond in-person interaction. Many acute care facilities have escalated their deployment of telemedicine/telehealth and patient video monitoring in an effort to provide more effective, efficient, and informative patient care, better utilize hospital staff while reducing burnout, enhance patient and family engagement, and increase both patient and staff safety. Use of AI technology optimizes staff workload while reducing potential errors due to overloaded staff.

BENEFIT

A camera in the patient room optimizes staff member workflow by reducing travel time for quick check-ins, enabling more rapid access to patients for both clinical specialists and non-clinical staff, providing telehealth and video translation capabilities, and eliminating the need for some patients to have dedicated in-room staff care. In-room patient cameras

increase the patient's family connection by providing video visiting capabilities, while providing automated monitoring for falls, stroke, sleep, confusion, and other relevant conditions.

RISK

Provision of a camera in the patient room creates potential privacy and loss of dignity concerns for patients related to surveillance and loss of privacy. This can be somewhat mitigated by having obvious on/off capabilities on the camera. If used to record video, there are significant privacy and HIPAA compliance concerns associated with the storage and potential access of this recording and the need for obtaining patient and family members' consent prior to recording.

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Risk



Patient Room Control

Patient control of the patient room environment including temperature, lighting, window shade position, and ambient audio improves patient satisfaction, reduces staff workload for mundane activities, and increases patient safety by providing both comfort and control.



Comfort and control of their environment is a significant patient satisfier. Being able to adjust the systems in their room reduces the feeling of helplessness that many patients feel when in a hospital.

—PHIL CROMPTON, PARTNER

NEED

Traditionally, the patient room environment is controlled via light switches and thermostats with rudimentary controls for lights (on/off) offered by the pillow speaker. Modern building automation systems allow the patient to adjust (within code limits) the temperature, lighting, shade position, ambient audio, and other systems within the patient room using the patient television and/or the patient's smart device.

BENEFIT

Giving a patient and their family the ability to control the lighting, shade, temperature, and ambient audio in their room increases patient satisfaction and provides comfort and control of their environment. Patient room control also reduces the number of mundane calls made to nursing staff, in turn saving staff time and increasing staff satisfaction. Automated configuration of the room's settings in response to an alarm/code in the room improves patient safety and supports clinical staff.

RISK

Room environment control is limited by code requirements and other factors –the temperature can only be adjusted by a few degrees, lighting can only be so bright, etc. – and these limitations may be a source of dissatisfaction to patients. In addition, increasing the sophistication of the room may confuse or irritate certain patients. Simple default controls must be in place for those patients who cannot or do not wish to control their room environment through a sophisticated interface.

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Risk



Patient Room Signage

A interactive digital room sign outside of each patient room displays patient information, noted alerts, infection control information, and (for credentialed staff) patient vitals and other electronic medical record data.



Live updating of the patient room sign increases staff and patient safety by ensuring the information is always current. During the pandemic, clinical staff reviewed this information before deciding if they needed to don PPE to enter the room.

—ALEXIS FULLER, SENIOR STRATEGIC CONSULTANT

NEED

In clinical environments without digital patient room signage, clinical staff frequently utilize paper or other physical materials to indicate patient-specific information outside of patient rooms. These methods rely heavily on clinical staff to manually update and are prone to error.

BENEFIT

Interactive digital signage outside of patient rooms increases staff satisfaction by providing access to real-time data and increases safety by providing live updates on a patient’s condition including real-time patient information, alerts, and warnings for staff. It increases patient satisfaction by allowing staff to view real-time patient vitals without having to enter the room and disturb the patient, and it supports room utilization alerts and integrations, such as maintenance or room turnover requests.

RISK

Displaying patient clinical information could inadvertently share patient data with nearby individuals, so patient clinical information should only be displayed for an authorized member of staff. Because staff will refer to the patient room displays for real-time information, any interruption in connection to real-time data will require that the display indicate prominently that it is “offline” so that staff are made aware that the information shown could be out of date.

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Patient Room Voice Charting

Speech recognition systems augmented with AI/machine learning technology support doctor and nurse interaction with the electronic medical record and other clinical software systems via the spoken word. Doctors and nurses use their voice to navigate through display screens and transcribe text directly into the electronic medical record.



Speech recognition technology has significantly advanced in the last few years, with context-aware AI systems providing an additional layer of error checking and correction.

—PHIL CROMPTON, PARTNER

NEED

In most clinical environments, medical staff interaction with the electronic medical record (EMR) and other clinical software applications is through a computer, keyboard, and mouse in or near the patient room. These traditional mouse and keyboard data entry methods are slow, subject to error, and offer poor user-interface design. The use of speech-recognition technologies allow clinical staff to interact with the EMR and transcribe notes directly into the record in a more natural way by using their voice.

BENEFIT

Voice charting systems, whether independent or as a supplement to traditional interfaces, increase staff satisfaction by improving workflow, speed, and convenience. Patient safety increases as the use of real-time transcription reduces the likelihood of a medical error due to a delay in data entry. Artificial Intelligence (AI)/machine-

learning systems will continue to improve voice recognition technologies, providing context-sensitive assistance to improve accuracy and reduce potential errors.

RISK

The voice charting system must be able to confirm that the individual speaking to it is authorized to do so. Patient privacy and HIPAA compliance must also be considered, because using the spoken word to enter data means that those nearby may be able to overhear. The voice charting system must be able to accurately understand spoken commands and data entry.

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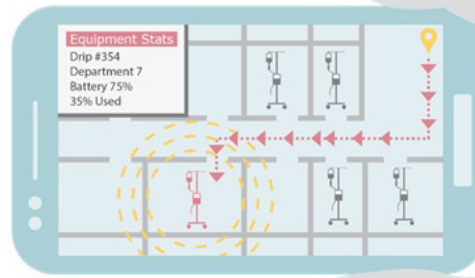


Risk



Real Time Location Systems

A campus-wide Real Time Location System (RTLS) with room-level resolution and granular tracking capabilities offers significant value by improving hospital operations, including enhanced workflows, improved staff safety, increased staff satisfaction, and elevated efficiencies.



RTLS is helpful on its own—locating assets, staff, and patients provides value – but the real magic happens when you integrate RTLS with other technologies and building systems to create a real “smart hospital!”

—ALEXIS FULLER, SENIOR STRATEGIC CONSULTANT

NEED

Hospital staff often spend significant time on “hunting and gathering” activities; when high-value equipment, important consumables, and staff are provided with RTLS tags, they can find what they need when they need it.

Integration of RTLS with other systems provides significant value by leveraging location-based contextual data to support building safety and smart hospital systems. This allows for the automation of low value tasks, improved understanding of the current state of the hospital, and, in the future, predictive analytics to streamline workflow and processes.

BENEFIT

Staff satisfaction is increased as they quickly locate equipment, consumables, other staff members, and patients. Safety is increased as the “help” button on their tag provides specific location information to responders.

Hospital operating costs are reduced as RTLS tagged equipment and supplies can be quickly located, reducing the

need for additional equipment, quickly locating equipment that requires maintenance, and demonstrating to regulatory bodies that specific equipment can be quickly located.

Patient and family member satisfaction is increased as RTLS integration provides additional value-added capabilities (such as the patient television displaying the name and purpose of hospital staff when they enter the patient room).

RISK

Deploying RTLS creates an imbalance in hospital services if coverage is not extended across the entire healthcare campus.

RTLS tags require batteries to function. A comprehensive battery replacement strategy will ensure the viability of RTLS services.

RTLS can generate negative connotations concerning the “tracking” component of the service. A comprehensive education program on the benefits to staff, patients, and visitors and the actual uses that the RTLS will address can help overcome this resistance.

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Wayfinding

Wayfinding can be challenging and a major source of patient and visitor complaints. A comprehensive wayfinding solution that offers multiple options to help patients, visitors, and staff find their way through various campus buildings can address these concerns.



As healthcare campuses have grown organically, finding one's way through the maze of buildings has become challenging for many patients and visitors. An interactive wayfinding solution helps address these concerns.

—PHIL CROMPTON, PARTNER

NEED

Wayfinding at existing hospitals can be challenging due to the organic nature of how the campus has developed over time. Floor numbers are not consistent as patients, families, and visitors transition between buildings and signage can only provide limited directions due to the plethora of potential destinations. A comprehensive wayfinding solution that addresses the needs of patients, families, visitors, and staff reduces frustration and improves both patient and staff satisfaction.

BENEFIT

An interactive wayfinding system will significantly improve patient, family, and visitor satisfaction by providing clear, real-time directions that update as needed to facilitate movement through the hospital and reduce doubt and concern about losing one's way. Personalized wayfinding from car to destination and back again (a major issue in many hospitals) can also be provided.

RISK

Unless it is backfilled into existing hospital buildings, an interactive wayfinding system will not be available in those areas. This has the potential to be a major dissatisfier for all campus visitors.

Interactive wayfinding systems will not be used by all patients, families, and visitors and so must be complemented by more traditional wayfinding and signage systems.

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Risk

