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BAPTIST MEMORIAL HEALTHCARE CASE STUDY
MIDWEST HEALTHCARE ENGINEERING CONFERENCE
IMPROVED STAFF EFFICIENCY AT GALION COMMUNITY HOSPITAL

Case study

Baptist Memorial Health Care

Memphis, Tennessee



Wireless system helps transform patient care through mobility and reliability

Baptist Memorial Health Care is an award-winning healthcare system dedicated to providing compassionate, high-quality, patient-focused care. With this dedication and in an ongoing effort to transform care at the bedside, Baptist contacted Johnson Controls, who has assisted Baptist with its technology needs for years, to install an in-building wireless distribution system in seven of its facilities. The system provides complete, reliable wireless coverage throughout facilities, enabling the use of wireless medical devices that enhance the patient experience and patient care.

For Baptist, mobility and reliability were key drivers in the decision to pursue a wireless distribution system and key to the success of its clinical documentation project, which included implementation

of an electronic medical record (EMR) keeping system. “We knew that going paperless required transforming care at the bedside, which in turn meant we needed mobility that didn’t exist,” says Stuart Mitchell, market leader for Baptist Memorial Health Care’s metropolitan market. “We also knew that when it comes to electronic documentation, even if we bought the very best system, it would not be successful if we didn’t have reliable connectivity at the point of care,” adds Beverly Jordan, vice president and chief nursing officer at Baptist Memorial Health Care.

Johnson Controls proposed an engineered wireless infrastructure involving a distributed antenna system designed for each of seven Baptist facilities. Unlike discrete antenna systems, which rely on overlapping fields of coverage often resulting in weak signals and dead spots, this integrated system uses multiple layers of coverage that are equal in size, providing redundancy, complete

mobility and guaranteed availability of a signal. “The number one reason we bought the system is because it provides clinicians with reliable access to information, when and where they need it,” says Mitchell.

Technology planning paves way for success

As Baptist embarked on its clinical documentation project it made a significant investment in research, vendor site visits and in getting the appropriate people engaged with the project. Studies were conducted on workflow, patient flow, how clinicians practiced medicine, and how information was recorded and exchanged during the course of caring for patients. The need for mobility to allow documentation at the bedside or wherever the patient was located became even more apparent. “It was obvious we couldn’t continue to be tied to stationary computers or rely on memorization for accurate recording,” says Mitchell. “Similarly, retrieving up-to-date information such as formularies and other critical information at the point of care would help ensure patient safety and quality of care,” notes Jordan.

With the decision made to go wireless, Johnson Controls Innovation Services facilitated a planning session with departmental personnel throughout the Baptist Memorial Health Care system. Personnel rated technologies that they considered most valuable to the organization and the importance of each one being wireless. “This was an important step in establishing a vision of what the wireless infrastructure would look like and be capable of,” says Keith Scarbrough, administrative director of IT at Baptist Memorial Health Care. “Johnson Controls responded very positively to our design challenges and assisted in executive level presentations necessary to gain confidence in the infrastructure.”

Because it is an engineered wireless infrastructure, consideration could be given to clinical versus non-clinical environments, to the required degree of saturation and capacity, to whether areas such as stairwells and elevators should be included, and what is



Physicians may access medical records using tablet computers.

“In order to provide the best clinical outcomes that we can, we’re looking for access to medical information from anywhere using a variety of devices, and the Johnson Controls wireless system provides that access.”

KEITH SCARBROUGH
ADMINISTRATIVE DIRECTOR OF IT
BAPTIST MEMORIAL HEALTH CARE



Clinicians use wireless carts to document patient information.



Personal communication devices are supported by the wireless infrastructure.

“Johnson Controls provided proof sources and helped key stakeholders to understand how the wireless system worked. This was especially important to a successful launch because we knew they would be there to support us.”

STUART MITCHELL
MARKET LEADER –
METROPOLITAN MARKET
BAPTIST MEMORIAL HEALTH CARE



Nurses stations incorporate wired and wireless devices such as two-way radios, digital pagers, and stationary and laptop computers.

the right thing to do for patients overall. “The process also allowed for concerns to be addressed as not everyone was completely comfortable with relying on a wireless system. It was critical to walk through potential points of failure with these key stakeholders and vendors to prove that the system could work,” says Jordan.

“Every patient encounter is absolutely vital to the success of that patient, the hospital and our industry. That’s why we strive for transparency and brutal honesty between our own departments and with our vendors. When you can find vendor partners like Johnson Controls that really do understand the need for this type of communication – you can do great things together.”

Having seen the wireless infrastructure in action, Mitchell understood it could not have a single point of failure. “Johnson Controls demonstrated this to key stakeholders as well by providing proof sources and helping them understand how the infrastructure works. This was valuable during the launch because it made us take the equipment riding on the wireless infrastructure into consideration as potential failure points,” says Mitchell. “In addition, Johnson Controls had established a level of trust within our organization through a longstanding relationship.”

Improving patient safety, quality of care, operational efficiency

“In order to provide the best clinical outcomes that we can, we’re looking for access to medical information from anywhere using a variety of devices, and the Johnson Controls wireless infrastructure provides that access,” says Scarbrough. “We did consider traditional discrete deployment, which has overlapping circles of signal distribution versus duplicate layers, but we were concerned about dead spots as well as leakage of signal beyond our facilities. And, because the wireless infrastructure is passive and components are not actively sending out signals they should last longer, resulting in minimal maintenance.”

The infrastructure supports voice and data systems such as personal communications/cellular carriers, local area networks, two-way radios, digital paging, handheld clinical devices, medical telemetry and the EMR system among others. Physicians and other clinicians are also able to bring in their personal equipment. As clinical equipment manufacturers continue to push more devices out on wireless, the infrastructure will accommodate them. From an IT perspective, this enables Scarbrough's team to provide more turnkey solutions to its internal customers.

"Because of the system's built-in redundancy, we know that our various clinical devices and communications equipment will be online so we can record and retrieve information, monitor and administer care where and when it's needed. This ensures the quality of care and the safety of the patient. It's really a matter of form and function. If we didn't have the ability to be mobile, we wouldn't have been able to accomplish our clinical documentation goal," states Mitchell. "There is no defined return on investment for the electronic medical record system other than what's most important, and that is improved patient safety and quality outcomes. By providing reliable connectivity – the wireless infrastructure augments those outcomes," adds Jordan.

Increased freedom and increased efficiency also equate to better care, according to Jordan. "The wireless infrastructure enables clinicians to do real-time documentation and more easily access information. The result is they have more time to do what they do best, and that's providing care." A bedside barcoding project is already in the works, which will further leverage mobility while increasing efficiency.

The design of the wireless infrastructure significantly reduces the need to breach the hard ceiling within facilities when a closet is not available for access points, which is extremely beneficial due to the importance of preventing and controlling infections. Johnson Controls and Baptist worked together to design and procure



Keith Scarbrough, administrative director of IT, Baptist Memorial Health Care.

"I feel it is important for us to share our wireless story with others in the industry. What we've learned from this may help others who may shy away from wireless. We believe it's something we've done well, we know it can work and it is a huge push forward for the industry."

BEVERLY JORDAN
VICE PRESIDENT AND
CHIEF NURSING OFFICER
BAPTIST MEMORIAL HEALTH CARE



Stuart Mitchell, market leader – Metropolitan Market and Beverly Jordan, vice president and chief nursing officer, Baptist Memorial Health Care.

enclosures for access points that are inserted into the drop ceiling. Once in place, access points can be maintained without breaking the ceiling barrier by simply unlocking the enclosure. “This is an excellent example of the difference between the typical deployment of a wireless system and the engineered deployment Johnson Controls provided,” states Scarborough.

Longstanding service and controls relationship brings trust

Baptist began its relationship with Johnson Controls through a contract to service and maintain a variety of brands of building automation and fire/life safety systems at Baptist Memorial Hospital - Memphis. “This relationship with Johnson Controls allowed us to maximize the life of those existing systems while creating a pathway to newer technologies,” says Gary Fowler, director of facility services for Baptist Memorial Hospital - Memphis. Johnson Controls helped Baptist assess which systems to keep, maintain or replace, regardless of manufacturer. One system that was replaced eventually was the building automation system, allowing Baptist to achieve better control of its environment. A Johnson Controls Metasys® building management system was installed to provide monitoring and control of HVAC equipment and controls throughout Baptist’s facilities.

In this process, Johnson Controls reviewed Baptist’s mechanical systems in their entirety, retrofitted specific equipment and designed the Metasys system to improve operational efficiency and minimize energy use through the use of new programming and control strategies. For example, variable air volume controls, variable frequency drives, actuators and CO2 sensors are integrated with the Metasys system to allow for improved airflow and better use of outside air while driving down energy costs. Nighttime setback programming is also used for select buildings. The existing fire system from another manufacturer, which was identified as being appropriate to keep, is maintained by Johnson Controls and integrated with the Metasys system.

The service contract with Baptist remains in place. Johnson Controls provides daily operational support, maintenance, monitoring and identifies additional opportunities for operational improvement and energy efficiency. The agreement includes Johnson Controls and other manufacturers’ building controls, fire/life safety systems and the Metasys building management system.

Humanizing Healthcare

The wireless infrastructure can also be used by patients and family members to communicate with others and access information. When an expectant mother needed to remain in the hospital for a lengthy period in order to deliver a healthy baby, the time apart for her and her husband was extremely difficult. “We asked the couple if they would like to be the first to test an Internet launch over the wireless system. They agreed to what became a source of mobility, freedom and communication for them both, and a successful way for Baptist to humanize the healthcare experience for our patients and their families going forward,” says Beverly Jordan, vice president and chief nursing officer.





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Improved Staff Efficiency at Galion Community Hospital

Improved staff efficiency at Galion Community Hospital (Galion, OH) by streamlining code reporting and therefore reducing the response time of the nursing staff

OPPORTUNITY

While striving for continuous improvement, Galion Community Hospital expanded its facility by adding a new surgical center with four surgery suites. The existing hospital building was utilizing Dukane's nurse call system. The nurse call system was integrated to an overhead paging system for code reporting purposes. This limited the paging code call system to external speakers only. The IT staff did not want to run analog speakers to the surgical center, so they choose to explore alternative solutions.

When researching potential solutions, the IT staff looked for a system that could leverage their Cisco VoIP infrastructure, and that could be expanded over time to include other types of awareness alerting functions.

RESULTS

"With the new technology, we were successfully able to tie together and seamlessly integrate old and new technology, therefore allowing our existing facility and new surgical area to work together," comments Andrew Daniels, Director of Information Systems at Galion Community Hospital.

HIGHLIGHTS

- Expansion project; new surgical center
- Integration to Dukane nurse call
- Streamlined code reporting between existing and new facility
- Directly ties alarms and alerts to hospital's communication systems

Improving Operations in an Acute Care Environment

Some ways to improve your facility can include:

- Two-way patient/ nurse communication
- Broadcasting emergency codes
- Environmental monitoring via sensors (i.e.. labs, server rooms, restrooms, pharmacies)
- Device tracking
- Monitoring of patient devices such as IV pumps

A hospital or an acute care facility is a complex environment that contains multiple systems that must efficiently work together. This obviously requires some level of integration between these systems which may include nurse call, security, fire panels, access control, paging, etc.

Efficiency Delivered by SARA

The Situational Awareness and Response Assistant (SARA) is an automated alerting system that sends voice and text alerts via phone, email, etc. SARA provides a wireless sensor network, integration tools (to existing systems and devices) and broadcast communication/ mass notification in a single solution.

This rich set of capabilities resides on a single technology platform, allowing your hospital or acute care facility to utilize one system to turn all of your alarms into managed alerts.

- One powerful alerting system
- The unique Voice of SARA
- Integration to current systems
- Safety and activity alerts
- Remote uptime supervision and disaster recovery

SARA can serve as the eyes and ears of the entire hospital and give every system and person including patients, a voice. Alert messages can be delivered anywhere, anytime, and in any order or method. With wireless capabilities, pull cords, fixed panic buttons and mobile panic buttons can be utilized or provided that push the alert to the

appropriate caregiver. The SARA software can send the response in a pre-programmed format and track and report on the response. SARA also has the ability to deliver an alert from video cameras in any area of the hospital by integrating to the video server.

Leveraging Current Infrastructure

Unlike other solutions, SARA was designed with an open systems or non-proprietary philosophy, allowing best-of-breed hardware platforms to be leveraged in order to build powerful solutions that meet customers' unique requirements.

For example, SARA can integrate with patient monitoring systems that monitor a patient's blood pressure, heart rate, pulse rate, etc. When an alarm occurs signaling attention is required (for instance the pulse rate has gone above or below a certain threshold), an alert can be sent to the appropriate personnel.

SARA can also monitor environmental functions such as the temperature level in refrigeration units. The temperature of samples, like blood for instance, is critical in a hospital facility. SARA can efficiently monitor temperature thresholds and report any deviations by sending an alert to the concerned individuals using its 'modes and actions' rules engine.

Establishing Two-Way Communication

In a healthcare environment, patients require the ability to communicate the need for assistance to their caregivers and to receive an immediate response. This is typically achieved by an intercom device in the patient's room. These intercom devices are configured as part of the nurse call system. The telephony handsets that are used by the nursing staff are connected to the patient telephone system. For seamless, two-way communication to occur there not only needs to be integration between the nurse call system and the telephony system, but also a 'talk-back' path must be established.

This can be accomplished by the "call bridging" feature of SARA as part of the nurse call integration package. As a result of the integration, when a patient requests help by activating the appropriate device (pull cord or pendants), the data which includes the intercom station number associated with the patient is sent to SARA. SARA will communicate to the wireless handset either by placing a call with the caller-id or by sending a text message with a soft key depending on the type of handset used. Faster response from the caregiver can equate to improved staff efficiency.

Broadcasting Emergency Codes

Emergency codes are used to convey essential information quickly and clearly to the staff to take the necessary action. Typically these code alerts are communicated to a group of people over a PA or radio network through the PBX switch board operator. This introduces unwanted delay in the notification process and can be avoided if the respective code alerts are directly communicated to the staff members on their mobile devices.

Broadcasting emergency codes can be easily and more effectively accomplished by SARA. Within SARA, each of the monitored devices (pull cords, wall buttons etc.) that generates code alerts can be tagged. Then the corresponding alert devices that need to receive the code alerts can be assigned to an alert group. When a monitored device is activated, SARA understands the corresponding code information that needs to be transmitted to the respective alert group on the corresponding alert devices (cell phones, wireless handsets, pagers etc.). This method ensures the accurate delivery of information to the staff for better communication and quicker response times.

Contact Information: Status Solutions, 1180 Seminole Trail, Suite 440, Charlottesville, VA 22901, p: (434) 296-1789, e: info@statusolutions.com, w: www.statusolutions.com



INDIANA SOCIETY FOR HEALTHCARE ENGINEERING
P.O. Box 40727
Indianapolis, IN 46240-0727

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