ZEBRA

Passive Smart Pump Management is More Productive, Reliable and Cost-Effective

ZEBRA'S PASSIVE RFID SYSTEM HELPS UNIVERSITY HEALTH SYSTEM IN SAN ANTONIO INCREASE SMART IV PUMP UTILIZATION RATES FROM LESS THAN 45% TO 70%

Nurses are essential to patient recovery and care. What's essential to nursing? Quick thinking and decisive action. A nurse's job description includes assisting doctors, monitoring and caring for patients, advising families, administering medications and much more. What doesn't it include? Serving as IV pump managers. One large Texas hospital found this out the hard way.

MAGNET HEALTHCARE FACILITY

University Health System's Hospital in San Antonio, Texas (UHS) cares for the sickest and most seriously injured patients in Bexar County and throughout South Texas. For the past four

years, U.S. News & World Report has ranked UHS and its network of outpatient healthcare centers the best in the San Antonio region. Its emergency department is the busiest in the area, with nearly 70,000 visits each year, serving as a trauma center for a vast, 22-county region of South Texas—one of only 15 Level I trauma centers in Texas.

As a teaching hospital, a referral hospital, a Level I trauma center and a center for innovation, UHS is a place where the best care is available to all. It is also a place where smart IV pump availability was becoming more and more of a problem.

SUMMARY

University Health System

Customer
University Health System
San Antonio, Texas

Industry
Healthcare

Challenge
Broken workflow management of smart IV pumps was impacting patient care. Nurses had to wait up to two hours before receiving a pump and were resorting to hiding pumps to ensure availability when needed.

Solution
- Zebra FX7500 Fixed RFID Readers
- Confidex UHF RFID Tags
- Mainspring Hospital Operations Management software

Results
Wait time for pumps has been reduced to just 8 to 12 minutes. Nurses are happy to have more time to spend on patient care. UHS is operating more efficiently. Equipment utilization has surged to 70%

Where are the Smart Pumps?

Smart IV pump devices play a critical role in today's patient care and treatment. What are smart IV pumps? A smart IV set-up features a large volume pump, called a channel, as well as a patient controller unit, called a brain, that run on a software system.

At UHS, smart IV pumps are in constant demand – from emergency departments and patient treatment areas to surgical units and patient rooms. To ensure that these IV pumps were readily available when needed, nurses were hoarding and hiding them in a myriad of locations. When one pump was discovered nestled in the ceiling tiles of a supply room, the hospital knew it had a problem. It also knew that the problem would only be exacerbated as it neared the end of construction of its new 420-bed Sky Tower addition, which includes 35 new surgical suites and an expanded emergency department.

LACK OF AVAILABILITY

After careful investigation by the hospital's technology service provider Mainspring Healthcare Solutions, UHS concluded that the issue was not a lack of equipment. In fact, the hospital had 7,000 IV pumps. The problem was better tracking and management of these critical resources to assure availability. UHS' IV pump equipment utilization rate was bottoming out at less than 45%.

The end result was diminishing patient care, with nurses spending too much valuable time either searching for or stashing equipment. At the same time, maintenance techs were spending as much time tracking down smart pumps as they spent fixing and cleaning them to get them back into the distribution cycle.

HIDE-AND-SEEK

The practice of hiding IV pumps is a nightmare scenario for everyone in a treatment setting, explains Gene Winfrey, director of information services in UHS' biomedical engineering department. "Patients aren't getting what they need in terms of care since devices are not available in real-time and nurses are hoarding or searching for equipment," he says, and that's worrisome when a hospital, such as UHS, employs over 1,300 nurses.

Hospital equipment maintenance techs were making daily 'fishing' expeditions, going room to room to seek devices needing decontamination or repair. In essence, smart pump management had been reduced to a process of hide-and-seek. In short, the UHS workflow in managing smart IV pumps was broken.

45%
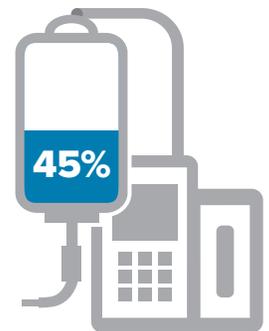
UHS' IV pump equipment utilization rate was bottoming out at less than 45%

WORKFLOW REPAIRS

The consequences were significant. Not only weren't clean pumps available when needed, dirty and broken equipment was being pushed out-of-sight and out-of-reach from those tasked with equipment cleaning and repairing. Fewer than 10% of all pumps were available at any given time.

That's not a situation any healthcare provider wants to be in given the increasing expectations, and the increasing costs, of delivering better care while operating as efficiently as possible. UHS knew their smart IV pump workflow was in need of repair. "We needed to get devices in reach of those who needed them, when they needed them and where they needed them," says Winfrey.

COST CONTROL

"Our whole objective was having the ability to place a particular device at the bedside when it's needed. It was not logical to just go purchase one for every room because the devices are very expensive," he said.

How expensive are they? Smart pumps can run $1,200 to $1,300; brains can cost between $2,000 and $2,500. One setup typically falls within a cost range of $3,000 to $4,000, including the software license cost. Of the 7,000

IV pumps in inventory, UHS had about 1,800 to 2,400 smart pumps and 600 to 700 brains in inventory. This level of inventory was even before UHS officially opened its new Sky Tower facility, which would double its footprint from one-million-square feet to two-million-square feet. The footprint expansion presented a prime opportunity for UHS to tackle its pump and equipment workflow management issue.

INCREASING TECHNOLOGY UTILIZATION

Residing within UHS' IT division, Winfrey's biomedical engineering department is tasked with directing maintenance for all medical equipment. Its main focus is patient safety while monitoring utilization of technology to promote predictive maintenance and improved utilization of mobile equipment.

Winfrey formed a project team—consisting of stakeholders from nursing administration to supply chain leaders, materials management staff and executive-level decision makers including the CFO, CIO and COO—to investigate a better way to manage smart pump workflow.

The goal, explains Winfrey, was simple: automate workflow around day-to-day availability and increase utilization of mobile medical equipment while enhancing patient care and staying mindful of additional costs.

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>
> Gene Winfrey
> Director of information services, UHS biomedical engineering department

| RFID | LOCATIONING | POWER-OVER-INTERNET | HOSPITAL OPERATIONS MANAGEMENT SOFTWARE | MOBILE TASK MANAGEMENT APPLICATION |

SMART PUMP WORKFLOW SYSTEM COMPONENTS

ACTIVE AND PASSIVE RFID

The team decided it was time to add a passive RFID strategy to their already existing active RFID system, allowing Winfrey's department to manage the lifecycle of utilization and use data to drive an automated workflow process. The hospital needed a closed loop, end-to-end approach that started with clean equipment being made available to nurses and ended with alerting biomedical engineering technicians about dirty equipment requiring cleaning and repair teams." Using passive and active RFID together would enhance our capabilities and give us the flexibility and workflow required," explained Winfrey.

ZEBRA PASSIVE RFID READERS

After testing potential RFID tags, antennas and readers, the UHS project team chose Confidex Steelwave Micro passive RFID on-metal tags for the IV pumps. They then turned to Zebra Technologies' passive RFID real-time locationing system, deploying Zebra FX7500 fixed RFID readers to eliminate hoarding and get nurses out of the IV supply business.

The FX7500 is plenum rated for concealing installations behind ceiling tiles and taking advantage of its Power-Over-Ethernet (POE) capabilities thereby reducing the need for costly power line drops. However, the reader's attractive appearance with low profile and compact footprint enables it to blend well into the hospital environment when a ceiling installation is not available.

"The Zebra readers were deployed where we need to know the status of equipment, so they are located in bio med, decontamination rooms, clean equipment storage areas and in certain sites such as the emergency center,"

explains Winfrey. Based on the success of the deployment, the system was expanded to include large volume pumps, analgesia pumps used by patients, feeding pumps and drains.

AUTOMATING WORKFLOW PROCESSES

The University Hospital team deployed Mainspring's Hospital Operations Management (HOM) software platform to track and manage tagged pumps and automate workflow. The HOM software system includes data analytics that build on historical data by tracking trends and usage patterns and adjusts par levels accordingly.

Mainspring's system automatically inspects and logs in devices, sending clean equipment to a supply room and returning used equipment to a soiled utility room. Nurses simply pick up ready-to-use equipment from the clean equipment supply room on each floor. In most cases, a nurse can simply visit a supply room and count on a needed piece of equipment being available.

Maintenance workers can also monitor the comings and goings of devices. A Mainspring mobile task management application automatically alerts them when a critical mass of devices has arrived in a soiled utility room and needs to be picked up for cleaning and possible repairs, or when a supply area is running low on clean equipment. In addition, maintenance personnel receive service and restocking requests from nurses via the application. Whenever a request for equipment delivery, pickup or service is generated, it is automatically routed to the next available materials management technician.

MAINSPRING
Healthcare Solutions

Mainspring's operations solutions help thousands of health care facilities in seven countries improve quality of care and patient satisfaction, at a lower cost. As a pioneer in hospital operations management solutions, Mainspring aims to help its customers do more with less, in a way that makes their work more enjoyable.

mainspringhealth.com

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A SYSTEM THAT WORKS

The effort, from the initial workflow assessment kick-off to deployment of tags, antennas and readers, took about three months to become operational. Results are extremely positive. Thanks to the new system, equipment hoarding is no longer an issue, Winfrey says. Nurses previously had to wait for up to two hours before receiving a pump. Now the wait time is down to just eight to 12 minutes.

"Today not only are nurses spending more time on patient care efforts, they know they can easily get their hands on equipment, either by picking up devices at a utility site on their floor or by tapping the management system to order up equipment as needed," says Winfrey, adding "they're not spending time hiding them up in ceiling tiles or behind window curtains."

In short, nurses are no longer working as semi-equipment managers and supply chain participants. Biomedical engineers aren't wandering halls hoping to find devices stashed in hidden locations. Technicians are spending their time repairing and cleaning, instead of hunting for devices to fix.

With the new system in place, utilization rates have climbed to 70% and the hospital has won back the all-important trust of the nurses and technicians.

REWARDS, BENEFITS, FUTURE GOALS

Increased efficiency equipment use is just one benefit UHS is gaining from the smart IV pump management system, notes Winfrey. "It's hard to quantify impact on patient care but if you've got a patient, the family and a doctor standing in a room there is a lot of anxiety about what's going on. The doctor says we're going to get you all set lickety-split but the nurse is thinking 'oh boy I need to find a brain and channel and it's going to be two to three hours because everyone's hiding them,' and that's not a great care environment," reflects Winfrey.

Nowadays the patient room scenario is quite different. The nurse taps a PC to check on equipment availability and typically within eight to 12 minutes that equipment is getting set up. "The patient and family are happy, the nurse is happy. It's a game-changing transformational activity now going on every day," says Winfrey.

It also illustrates UHS' continued quest to deploy technology to enhance care while keeping a clear eye on costs. The health system was again named this year, for the seventh time, as one of the nation's Most Wired Hospitals and Health Systems by *Hospitals & Health Networks* magazine.

"Our mission is to provide excellent care to our patients, and we've found that smart investments in technology help us focus quickly on the individual needs of those patients, making their care safer, more effective and more efficient," states George B. Hernández Jr., president and CEO of UHS, in an announcement regarding the news.

EXPANDED EQUIPMENT MANAGEMENT

Moving forward, Winfrey expects more technology innovation as his team hopes to expand the pump equipment management strategy to other medical devices such as beds. "We're talking about tagging equipment to specific units and expanding the distribution model to gain greater transparency. Everything is on the table for discussion," he says.

His advice to healthcare providers and hospitals mulling an equipment management approach is straightforward. "It's important to start with an understanding of what you do and how you do it, and to be honest about it," he says, adding it takes time to develop an appropriate workflow and then make a technology work within that workflow.

For UHS, these equipment management changes already mean that the days of smart IV pump hide-and-seek are over.

HealthCare's
most wired ®

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