

SAFETY AND SAVINGS IN LAS VEGAS: Nurses Have Decision Support at UMC

As

one of the country's fastest-growing cities in the early 21st century, Las Vegas, Nevada, has had to shoulder all the demographic challenges that

distinction entails. Through it all, University Medical Center (UMC) has steadfastly maintained its role as the safety net for the sickest and neediest patients in this metro area of nearly two million people. UMC, a 565-bed facility affiliated with the University of Nevada School of Medicine, combines the role of county hospital with that of Nevada's only Level 1 Trauma Center, only burn-care unit, and a world-class children's hospital.

Founded in 1931 to serve workers building nearby Hoover Dam and operated by Clark County, non-profit UMC has never been deterred from its mission despite red-hot competition from several new for-profit hospitals built during the burgeoning growth of the early 2000s. While 10 large hospitals now compete for the local market, the recession has dramatically curtailed that growth—at least one new hospital stands empty today—and further accentuates UMC's charitable role. Each year it admits about 30,000 inpatients and treats nearly 70,000 adult patients in its emergency department and more than half-a-million ambulatory patients.

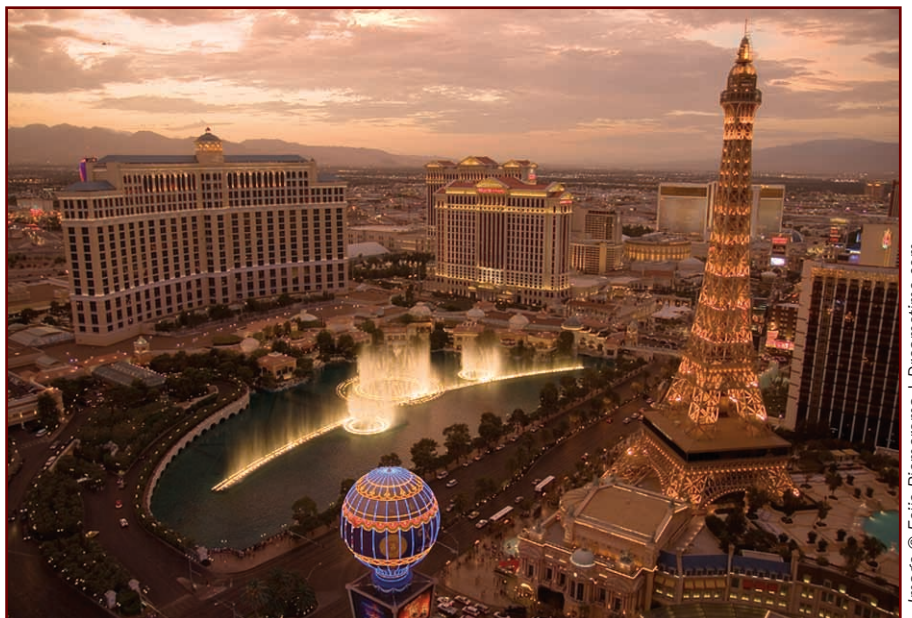


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By
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In keeping with its mission, UMC has focused its 4,000 employees, including 1,550 nurses and 1,400 physicians, on patient-centered care emphasizing quality and patient safety, including core measures, a “patient safety net” system to report medical errors in a non-punitive manner, as well as aggressive infection-control and medication-safety programs.

A key piece of UMC’s patient-care strategy is a closed-loop medication management system that uses automated dispensing cabinets and barcode scanning at nursing stations to ensure accurate medication dispensing. Now UMC is advancing that strategy by becoming the first hospital in the nation to adopt software that integrates clinical data from multiple sources and delivers alerts to nurses at their automated medication dispensing cabinets when potential adverse drug reactions are detected.

Improving Patient Safety

UMC implemented this unique software in December 2009 on its cardiac care unit (CCU) and cardiovascular care unit (CVCU), where 24 beds support patients with some of the highest needs in the hospital. The innovative system assists clinical pharmacists in identifying patients for adverse clinical events and tracks laboratory results for any changes requiring potential intervention.

Previously, the pharmacy or laboratory identified an adverse event (example: potassium levels being too high), and would place a call to the nurses caring for the patient for corrective action. Now with the Pyxis® Advisor technology, this same information is sent automatically to the automated medication dispensing cabinet on the patient’s floor triggering an alert that reports on out-of-range laboratory values. Nurses must respond to each alert before proceeding with medication dispensing for the patient. Through this connectivity, nurses are now getting the same kind of clinical decision support reported through their automated medication dispensing cabinet and nearer to the point of care where it can help nurses most in caring for their patients.

Anyone who visits a CCU or CVCU is immediately struck by the intense personal attention that patients there require and the critical role nurses and other caregivers on these units play in continually monitoring their patients’ conditions. That’s why critical care nurses are assigned to only one or two patients per shift and why IT-based tools have become so important in critical care. It’s also why the medical center’s CCU and CVCU developed even more stringent laboratory values as alert triggers than the hospital laboratory uses for med/surge floors, which treat less severely ill patients.

Using the automated medication dispensing cabinet, CCU nurses like Edna Jimenez, RN, call up critical medication information about their patients to guide them in the medication-monitoring process. If a patient’s lab value is out of range, such as a patient on warfarin with a high INR or whose potassium level is too low or too high, an alert is triggered on the automated medication dispensing cabinet. “It stops your workflow,” she says, “until appropriate action is taken.”

Patient alerts incorporated in the system display on the automated dispensing cabinet when the nurse selects a patient in automated workflow, the sequence of steps delineated on the computer for medication removal and administration. Once the alert blocks the nurse’s workflow, it presents the nurse with the patient name and identifier, the numbering of alerts, type of alert, lab value, date of alert, and the date of the lab test that triggered the alert. After reviewing the alert, the nurse can check the “Reviewed” box and then “OK” to suppress the alert and not be presented with it again. Alternatively, the nurse can simply check “OK” and will be presented with the alert on each subsequent selection of that patient until “Reviewed” is checked or until the alert is resolved. Selection of “Print Alerts” will print the alerts on the automated medication dispensing cabinet printer.

Giving Nurses the Tools They Need

“We have a significant focus on medication safety,” says Diana Bond, UMC’s director of pharmaceutical services. “It’s not just physicians and pharmacists who need timely information, but also our most active resource—nurses—need to be engaged. This new program gives us the opportunity to be more proactive and enhance communication between physicians, pharmacists, and nursing. Our intent is to give nurses the tools they need at the point of care.”

UMC was focused on medication safety even before the 1999 Institute of Medicine report (published in 2000), which famously estimated that 98,000 patients died each year from medical errors, many of which were medication errors. “The IOM report gave us fuel,” she says, to build a strong medication safety initiative throughout the enterprise. In 2006, the IOM published a report on medication safety, *Preventing Medication Errors*, which estimated that a hospital patient on average is subject to one medication error a day. Also, the report estimated that preventable adverse drug events (ADEs) in hospital patients increased length of stay by 4.6 days and total costs by \$5,857 (based on 1993 cost data) (Osherooff, et al., 2009).

“This new program has paid for itself in terms of safety and timely care,” says Bond, adding that sometimes that can mean knowing when to stop a therapy. “If you can get the patient the right drug faster you can also de-escalate drug therapy so we don’t run the risk of multi-drug-resistant bacteria—not to mention the extra cost,” she says. “I really see another huge win by reducing the amount of antibiotics we administer to patients, which accounted for 40% of our annual drug budget a few years ago and now is about 25% of our budget.”

Savings from de-escalation of therapy should become even more apparent when the service becomes deployed as part of UMC’s infection control system, notes Bond.

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“Good patient care invariably results in costs savings. I’d anticipate we’ll see our antibiotics budget decrease by having this technology implemented hospital-wide,” she says, noting that a 5% decrease alone translates to \$500,000 to \$1 million in annual savings.

UMC nurses view this as another vital piece in an integrated system aimed at eliminating medication errors. “Now I know I have a safety net,” says Christine Rumbold, RN, “and that is reassuring given that our patients are so critically ill.”

Initial alerts include adult patients having low potassium, low potassium with a drug (like digoxin or dofetilide), high potassium with a drug (ACE inhibitors, diuretics, for example) and patients on the blood thinner warfarin and an INR alert (INR measures how quickly a patient’s blood clots).

A key feature of this tool, notes Nina Carter, PhD, RN, director of nursing practice, clinical education and research, “is interconnectivity. Nurses love it. They find it a great adjunct to a busy day in case they were missing something. It makes it so much more convenient to get that warning.” One long-term return she hopes for is a reduction in patient length of stay and resulting cost savings. That’s especially likely under pay-for-performance (P4P) programs that will decline to pay for hospital days beyond specified limits.

Another long-term return she predicts will be a decrease in poor clinical outcomes related to the pharmaceutical agent, such as medications that are out of a patient’s therapeutic range. “Dosage, lab values—the list is endless,” she says. “It will alert us to patients who are on the wrong antibiotic based on myriad factors. It takes the guesswork out. You don’t want a single point of failure. I think it’s really going to link to a reduction in hospital-acquired infection. It facilitates quicker compliance to an appropriate treatment plan.”

Early Measures of Nurse Satisfaction

A key consideration when using any new technology is its acceptance by the nursing staff and its integration into their workflow. In early February, 2010, CareFusion (the software vendor) conducted a survey of nurses who were using the new product. Nurses responded from two hospitals (UMC and Princeton Baptist Medical Center in Birmingham, Ala., site of the second pilot) representing three critical care units, and one medical surgical unit.

The survey’s purpose was to measure feedback from nurse users regarding the impact on workflow and patient safety as well as to obtain general feedback from these initial users. Nurses responded to several questions on a 1-to-6 rating scale with 1 being strongly disagree and 6 being strongly agree.

While many of these nurses had only been using the program for a relatively brief time and may still have been in a learning curve, the survey results were revealing:

- 86% indicated that the alerts assisted them in the clinical decision-making process.
- 84% felt the alerts had increased the level of patient safety for their patients.

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While these are early findings, the data indicates that these nurses believe that these alerts do not change nurse workflow while improving patient care and patient safety. Importantly, about 4 out of 10 believed the alerts had already “prevented an adverse drug event for my patient.” This becomes important from a patient safety, cost, and quality-of-care perspective given the high costs of treating patients who experience adverse drug reactions.

Conclusion

While the journey toward improved patient safety and quality of care has made strides in the decade since release of the IOM study, it’s clear much more progress is needed. Patient safety will not be delivered through a single device, technology, or process. It will result from multiple initiatives throughout the care continuum. Many of these solutions will tap information technology and provide alerts and an early warning system to better monitor and report on a patient’s condition before it worsens.

Critical to this journey are transparency, open communication and the ability to modify workflow processes when needed to bring clinical decision support ever closer to the point of care. **IPSQH**

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TECHNOLOGY OVERVIEW

University Medical Center in Las Vegas, Nevada, uses CareFusion products for closed-loop medication management, including Pyxis® MedStation 4000 and Pyxis® Advisor, which delivers alerts directly to automated dispensing cabinets.

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