Redefining Resuscitation: Dana Edelson, MD, and Mike Howell, MD, discuss inpatient cardiac arrests.

Patient Care Events: What We've Done

Leading by Example: Q&A with a clinical nurse educator

Awards & Recognition

January 2014
Welcome to the third edition of the University of Chicago Medicine’s Clinical Effectiveness Report. You will note some important changes with this release including enhancements to the look and feel of the Report. These changes are more than aesthetic. With our focus on transparency and communication, my team and I wanted to be sure that the Report is accessible and rich in content. I think you will agree that the change in format and style helps as well.

**SOME HIGHLIGHTS:**
- We have introduced a new recurring feature in which we discuss a key priority metric in detail. This month’s piece looks at the work and expertise of Michael Howell, MD, our Associate Chief Medical Officer for Clinical Quality. Dr. Howell is working in collaboration with Dana Edison, MD, and other clinical and administrative leaders to enhance and improve our already accomplished inpatient resuscitation program. This work, an integral part of our annual operating plan, showcases the interface between clinical performance improvement and the scholarly accomplishment that we value at the University of Chicago Medicine.
- In the “Patient Care Events” section, you will find brief descriptions of the kinds of safety events and near-misses that are common to all complex medical systems. We look at how these experiences are turned into success stories and improvements thanks to the work of our clinical effectiveness teams and front-line providers. I think you will agree that this provocative and engaging approach will help our entire medical community understand that we proactively address the issues that most challenge our patients and staff.
- In “Leading by Example,” we will have a Q&A with a staff member who is pivotal to our efforts to improve quality and safety. In this edition, we talk with Clinical Nurse Educator Valerie Bednar, BSN, CCRN, who trains new nurses on how to care for patients with central lines.

I invite you to leaf through this Report and welcome any feedback.

Sincerely,

Stephen Weber, MD
Chief Medical Officer
Vice President for Clinical Effectiveness

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RESELYCNI AND RESCUE CARE: Redefining Resuscitation

More than 200,000 people have cardiac arrests while in U.S. hospitals every year, and more than 80 percent of these patients do not survive, making this condition a major public health problem.

At the University of Chicago Medicine, preventing cardiac arrests is one of the top quality and safety goals of 2014. Considerable strides have been made in early detection and treatments of unstable patients in recent years, transitioning from a more reactive model of crisis management to one that focuses on prevention. To that end, professionals who have particular expertise in preventing and responding to cardiac arrest were added to UChicago Medicine’s Clinical Effectiveness team last year:

- Michael Howell, MD, MPH, joined as Associate Chief Medical Officer for Clinical Quality in July. As a critical care physician with expertise in sepsis and rapid response teams, one of Howell’s first goals was to focus on cardiac arrest.
- Dana Edelson, MD, MS, was named the first Medical Director of Rescue Care and Resiliency.
- Meredith Borak, RN, MSN, was named Manager of rescue Care and Resiliency. She manages a team of nurses whose ultimate goal is to prevent cardiac arrests from occurring outside of the ICU.

This team embodies a true partnership between physicians and nurses in preventing this devastating condition. The new structure also allows a melding of clinical care, quality and scholarship across the medical campus.

THE PAST: WHAT WE’VE DONE

Resuscitation has historically been focused on patients in cardiac arrest, for whom the mainstay of therapy is cardiopulmonary resuscitation (CPR), which includes chest compressions and defibrillation (electric shocks). Over the last decade, UChicago Medicine has been a pioneer in CPR research. It was the first hospital in the world to implement accelerometer-based CPR sensing to ensure compressions are deep enough to be effective and to demonstrate that real-time audiovisual feedback and post-event debriefing using CPR/ECG (electrocardiography) transcripts could improve CPR performance and patient outcomes.

Every adult defibrillator in the inpatient Medical Center is now outfitted with a CPR sensor and provides real-time feedback during CPR. The CPR quality that our patients receive is second to none, and the outcomes from cardiac arrest are significantly better than national norms (Figure 1).

THE PRESENT: WHAT WE’RE DOING

Borak oversees the Critical Care Outreach Team, a cadre of six expert nurses who respond to all rapid response calls around the clock and engage in proactive rounding on high-risk patients.

Under her watch, the number of rapid response calls has gone up dramatically, as our clinicians are increasingly better trained at identifying signs a patient is deteriorating. As a result, there has been a decrease in cardiac arrests (Figure 2). This is consistent with data from other institutions.

THE FUTURE: WHERE WE’RE GOING

Until now, the identification of critically ill patients outside the ICU has relied entirely on clinicians, resulting in significant activation threshold variability not driven by the patient. However, recent research conducted at UChicago Medicine has shown that cardiac arrest, ICU transfer and mortality can be predicted with good accuracy — often as early as 24 hours before.

This has led to our development of a risk-prediction algorithm that utilizes vital signs, demographics and laboratory data to predict clinical deterioration of adult inpatients throughout their hospital stay.

With support from Chicago Biomedicine Information Services (CBIS), the Medical Center has recently completed pilot testing of a near real-time data feed and calculation and is in the process of moving it into clinical production. This will enable dynamic reporting of the composite risk score with automatic notification of clinical providers when patients’ risk of cardiac arrest goes up.

Figure 3 shows how this real-time risk prediction looks for an individual patient who was hospitalized on the floor, received a Critical Care Outreach Team call and was subsequently transferred to the ICU. Automatic notification would have activated the RRT about 12 hours earlier.

The University of Chicago Medicine’s Clinical Effectiveness work protects patients, but the team and their colleagues also aspire to having a broader impact across the country. Some ways this impact is seen: in scientific publications, textbook chapters, and national guidelines and consensus statements. To see some examples, visit uchospitals.edu/clinical-impact.
At the University of Chicago Medicine, patient care events are analyzed to identify opportunities for improvements in safety and clinical quality. In the past five months, about 3,125 potential events and near misses were reported — that’s about 20 per day. Of these, 19 rose to the level for a full root cause analysis (RCA). Here is a sampling of some cases and the outcome of the Medical Center’s proactive work as well as what was learned.

WHAT IS ROOT CAUSE ANALYSIS?

Root Cause Analysis, or RCA, is a comprehensive and systematic methodology to identify any gaps in systems and processes that may not be apparent and that could have contributed to an occurrence or event.

The analysis occurs during root cause meetings with the front-line clinicians, during task force meetings called to address specific safety concerns, and through the routine review by the risk management, safety and quality teams. The goal is to identify any improvements that can decrease the chances of such an event or occurrence from reoccurring.

UNINTENDED BLOOD TRANSFUSION

BACKGROUND:
During surgery, an anesthesiologist ordered a unit of blood to be administered to the patient but later determined the blood wasn’t necessary. Due to inconsistent work flows and breakdowns in communication, the order was not canceled and the blood was administered to the patient.

WHAT IT DEMONSTRATED:
The need to standardize the blood ordering process.

PLAN OF ACTION AND OUTCOME:
A multidisciplinary task force comprising Anesthesiology, Blood Bank, Epic, Nursing, Patient Safety and Surgery created an operating room “Blood Transfusion Order Set” in Epic, the electronic medical record system. This new order set eliminated a workaround consisting of paper-based forms and several handoffs among clinicians.

DELAYED PROCUREMENT OF BLOOD DURING OBSTETRIC EMERGENCIES

BACKGROUND:
A series of near-miss events occurred across the Medical Center where clinical care teams faced challenges in immediately obtaining massive quantities of blood as patients were experiencing significant blood loss.

WHAT IT DEMONSTRATED:
Challenges in quickly ordering, issuing and transporting large amounts of blood products.

PLAN OF ACTION AND OUTCOME:
A Massive Transfusion Protocol Task Force was created, identifying short- and long-term solutions. In the short term, the blood refrigerator par levels were increased from 6 units to 8 units of O negative packed red blood cells. When the pneumatic tube system is down, the hospital operations administrator will assist in transporting blood products. Also, mobile blood refrigerators will be deployed to deliver a large volume of product. Ongoing work continues using high fidelity human simulation and a simulated patient in Epic to test the system. In the long term, the pneumatic tube system is being expanded, with completion expected in February 2014. The Task Force will continue to provide ongoing oversight.
**Equipment-Related Damage/Magnetic Resonance Imaging (MRI) Safety**

**Background:**
During preparation for a patient’s arrival in a radiology suite, a ventilator was pulled into the magnet core in one of the MRI machines in the Center for Care and Discovery. This resulted in damage to the ventilator and downtime for the MRI.

**What it Demonstrated:**
Inconsistent implementation of safety measures in MRI suites.

**Plan of Action and Outcome:**
MRI safety measures were immediately reviewed and standardized. Examples include marking the floors in the magnet room with a line to indicate the minimum safe distance for MRI/conditional equipment, and signage to alert staff to Zone III (an area where MRI/safety screening is required) and Zone IV (an area restricted to authorized personnel only).

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**Emergency Response to Aortic Dissection**

**Background:**
A post-surgical patient suspected of alcohol withdrawal received an overdose of Ativan. The patient required only supplemental oxygen and close monitoring to treat the overdose.

**What it Demonstrated:**
Safety tools created to help guide treatment were not widely accessible to the staff. The tools include an Alcohol Withdrawal Algorithm and Pharmacotherapy Protocol and Order Set in Epic, which were not widely known to the medical staff and house staff physicians.

**Plan of Action and Outcome:**
To facilitate access to the alcohol withdrawal order set that links to the pharmacotherapy protocol called “Treatment Goal for Alcohol Withdrawal,” the synonym list was expanded to include different search parameters, including AWS, EtOH, Alcohol Withdrawal, CIWA, CIWA, CAGE, cage, WD and W/D.

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**Drug Overdose**

**Background:**
A sudden change in patient condition coupled with worker fatigue can affect a procedure.

Surgeons have begun to use the Glassman Viscera Retainer, which replaces the need for laparotomy sponges, during abdominal cavity closure. Also, new policies for intra-operative X-ray triggers were added: organ transplant/procurement and surgical cases when the OR nursing staff have worked 18 hours or more within a 24-hour period.

**What it Demonstrated:**
That a sudden change in patient condition coupled with worker fatigue can affect a procedure.

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**Retained Foreign Object (RFO)**

**Background:**
The RFO Task Force conducted a review of an unintentionally retained laparotomy sponge. Policy and procedural changes, such as criteria to trigger an X-ray to look for a foreign object, already were in place to prevent such occurrences during invasive procedures. However, this case did not meet the criteria. The routine protocol of sponge-counting was instituted, and the care team falsely correlated the number. What led to the RFO was a sudden hypotensive episode during cavity closure coupled with workplace fatigue for the nurses involved in the case.

**What it Demonstrated:**
A post-surgical patient suspected of alcohol withdrawal received an overdose of Ativan. The patient required only supplemental oxygen and close monitoring to treat the overdose.

**Plan of Action and Outcome:**
Safety tools created to help guide treatment were not widely accessible to the staff. The tools include an Alcohol Withdrawal Algorithm and Pharmacotherapy Protocol and Order Set in Epic, which were not widely known to the medical staff and house staff physicians.

**Plan of Action and Outcome:**
To facilitate access to the alcohol withdrawal order set that links to the pharmacotherapy protocol called ”Treatment Goal for Alcohol Withdrawal,” the synonym list was expanded to include different search parameters, including AWS, EtOH, Alcohol Withdrawal, CIWA, CIWA, CAGE, cage, WD and W/D.
The University of Chicago Medicine formed a Central Line Associated Blood Stream Infection (CLABSI) Task Force in fiscal 2011. Since then, the Task Force has been part of a campus-wide effort to significantly reduce central line infections, a closely watched national metric used to measure patient safety. In a large database of more than 115 U.S. academic medical centers, we have the second lowest rate of central line infections in the country.

Our achievements in reducing the risk of CLABSI are not just attributable to the expertise and experience of those in the infection control program. Key to our success has been the engagement of front-line clinicians and other leaders who have embraced the challenge to help disseminate best practices in support of all patients. One such person is clinical nurse educator Valerie Bednar, RN, BSN, MA, CCRN.

**Q&A with a Clinical Nurse Educator**

**What is the goal for fiscal 2014?**

A: The goal is to reduce the CLABSI rate to 0.5 per 1,000 days. This goal requires renewed vigilance among staff across the Medical Center, which I think is achievable.

**How important is it to lower central line infections?**

A: Bloodstream infections can seriously affect someone whose immune system is already compromised, and leads to thousands of deaths throughout the country each year. I think we have a strong program in preventing CLABSI. We invest a lot of time and effort into keeping our patients safe. It’s a very effective program, and teaching is something I can do to help nurses take care of patients across the Medical Center.

**How important is it to lower central line infections?**

A: From fiscal 2009 to fiscal 2013, CLABSIs in the Adult Intensive Care Unit have decreased from 27 incidents to 1 incident. Overall, the Medical Center’s numbers have dropped significantly in just the last two fiscal years, from 45 incidents in fiscal 2011 down to 26 in fiscal 2013.

**How much has the Medical Center improved in reducing central line infections?**

A: The continued success is attributed to standardized training across the medical campus. All nurses are required to view a computer-based training led by nurse educators who demonstrate the mandatory steps of cleaning and dressing a central line. Each nurse must then perform the required steps successfully to pass the course. Home health care service providers are trained on this standard for placing a central line. And physicians complete simulated training and observe real-time catheter insertions. Trained observers monitor and document insertions, and case reviews are conducted on each central line associated bloodstream infection.

**How has the Medical Center achieved this success?**

A: The Cardiology and ED group that cares for heart attack patients was recognized with the American Heart Association’s Mission: Lifeline Bronze Receiving award, which recognizes hospitals that meet treatment criteria for heart attacks, also known as STEMI, which is short for ST-segment elevation myocardial infarctions.

**Certifications & Accreditations**

- The University of Chicago Medicine maintained its “A” safety grade in Leapfrog Group’s survey of more than 2,500 U.S. hospitals. The Hospital Safety Score rates how well hospitals protect patients from accidents, errors, injuries and infections. The University of Chicago Medicine has received the highest grade from Leapfrog, a prominent hospital ranking group, since the regular survey began in June 2012.

- The bariatric team was re-designated as an Aetna Institute of Quality for having high volumes and producing clear clinical results.

- The Cardiology and ED group that cares for heart attack patients was recognized with the American Heart Association’s Mission: Lifeline Bronze Receiving award, which recognizes hospitals that meet treatment criteria for heart attacks, also known as STEMI, which is short for ST-segment elevation myocardial infarctions.

- The National Multi Sclerosis Society has named the University of Chicago Medicine a Multiple Sclerosis Center of Excellence.

**Awards & Recognition**

- The National Cancer Institute (NCI) re-designated the University of Chicago Medicine as a Comprehensive Cancer Center, one of only two in Illinois and one of 41 nationwide to receive this designation. In 2011, the Commission on Cancer of the American College of Surgeons gave the uChicago of the american College of Surgeons accreditation with commendation. accreditation: a three-year
The University of Chicago Medicine Clinical Effectiveness (CE) Program was established in 2011 under the leadership of Chief Medical Officer Stephen Weber, MD. The CE Program incorporates already-established and successful UChicago Medicine strategies in patient safety, risk management and infection control. The Program collaborates with clinical and administrative leaders to oversee clinical practice across the medical campus to ensure patient safety, clinical quality, efficient and rational practice, and outstanding patient experience. Under CE, the quality program has been completely redesigned with a focus on rigorous analytics and performance improvement. In 2013, the Office of Patient Experience was integrated into CE.