

SAVING LIVES AT CENTURA

A Colorado System Has Developed a Rapid-Response Team for Critically Ill Patients

BY JANE BRAATEN, RN, MS; SANDRA LEVIN, RN, MBA; P. TERRENCE O'ROURKE, MD; DEBORA SMITH, PhD; & BERYL VALLEJO, DrPH, RN

In July 2005, Centura Health, Englewood, CO, implemented a new, systemwide process that enables staff members to identify patients likely to go into cardiac arrest before such arrest happens. Because the process has been shown to save lives that otherwise would be lost, we, the authors of this article, who work in cardiac care and patient safety/quality at Centura Health, decided that we should share the method with others.

THE RAPID RESPONSE CONCEPT

Most hospitals in the United States have "code blue" teams that respond to inpatient episodes of cardiac arrest. However, the survival rate after a cardiac arrest is poor, especially in patients outside intensive care units (ICUs).¹ Studies indicate that many patients show subtle clinical changes eight to 24 hours before a cardiac arrest.² To improve survival rates, hospitals have developed "rapid response teams" (RRT) to work with hospital staffs in non-ICU settings to identify and treat patients before a cardiac arrest occurs. Hospitals that have instituted RRT programs report declines in non-ICU cardiac arrests and

hospital mortality.

The RRT concept was pioneered at Austin & Repatriation Medical Centre, a teaching hospital in Melbourne, Australia. A research team there analyzed outcomes of surgical patients admitted before and after the development and implementation of an RRT. That study showed significant reduction in the deaths of surgical patients, fewer cardiac arrests on medical-surgical units, and a reduced length of stay after the RRT was in place.³

In this country, the Cambridge, MA-based Institute for Healthcare Improvement (IHI) is sponsoring a 100,000 Lives Campaign to improve patient care and prevent avoidable deaths. IHI, which recommends that all U.S. hospitals implement RRTs, has included this initiative in its campaign (for more information, see www.ihl.org/ihl/programs/campaign/).

RRTs AT CENTURA HEALTH

Centura Health, comprising 12 Colorado hospitals, is the largest health care system in the state. When clinicians throughout the system learned about the RRT concept in 2004, they enthusiastically embraced it as a means of reducing hospital mortality. Since staff and physicians often work in more than one system hospital, they recommended that the RRT composition and functions be standardized across all facilities. The clinicians, wanting to see an immediate impact on mortality, chose to implement the program rapidly and simultaneously in all 12 hospitals.

In this article, we intend to describe the method that Centura used to develop and implement its systemwide RRT program over a 90-day period and to describe the initiative's early outcomes.



Ms. Braaten is director, cardiovascular services, Porter Adventist Hospital, Denver; and Ms. Levin is director, quality and patient safety, Parker Adventist Hospital, Parker, CO. Dr. O'Rourke is chief medical officer and Dr. Smith is vice president, process improvement, Centura Health, Englewood, CO. Dr. Vallejo was formerly vice president, quality, safety, and outcomes management, Centura Health.

RAPID DECISION MAKING

The decision to implement RRTs was easily made because clinicians recognized in the program an opportunity to improve patient care and reduce mortality. The more difficult task involved getting 12 hospitals to commit themselves to developing and implementing a standardized protocol in a short time. To accomplish this, we chose to use the Rapid Decision-Making Process (RDMP).

RDMP, which is taught by a Six Sigma "master facilitator," enables swift, team-based problem solving.* During the course of a single RDMP session, team members systematically scrutinize a process or problem and develop solutions for it. Once team members have developed the new process, they present it to a "sponsor/champion" who will accept or reject the proposal or refer it back to the team for improvements. Implementation of the new process generally occurs within 30 to 60 days of the RDMP session. RDMP is unlike the work done by a traditional committee or task force in that its participants not only design new processes; they also take responsibility for implementing the processes and ensuring the outcomes.

Once Centura had decided to develop RRTs, representatives were invited from all 12 hospitals to participate in a RDMP session at Castle Rock, CO, in April 2005. The 50 participants thus became an RDMP team. During the session, team members identified six priority areas and formed subcommittees to address each one. The six priority areas were:

- Criteria
- Policy and procedure
- Communication
- Measurement/outcomes
- Regulatory/legal matters
- Education

Every subcommittee included at least one representative from each of the 12 participating facilities and from each of the disciplines pertinent to that subcommittee (the disciplines were nursing, medicine, respiratory care, education, quality, and process improvement). To identify "best practices" associated with their respective priority areas, the subcommittees solicited ideas from physicians and nurses and reviewed information from various sources (IHI, journal articles, and others). Many of the ideas, policies, procedures,

and forms the subcommittees developed were adapted from the IHI's 38-page *Getting Started Kit: Rapid Response Teams*.†

Once the subcommittees had gathered ideas and made recommendations, the RDMP team began the work of creating RRTs. The team was given 90 days to have the RRTs fully operational across the system.

SUBCOMMITTEE RECOMMENDATIONS

The work of the six subcommittees can be summarized as follows.

Criteria The Criteria Subcommittee borrowed recommendations from the *Getting Started Kit* and developed additional criteria that were based on outcomes at Centura hospitals. The group also established basic RRT composition and the competencies expected of RRT members. In each hospital, the group decided, a critical care registered nurse (RN) and a respiratory therapist would form the core of the RRT. At some facilities, the team would also include a physician and a chaplain.

The subcommittee determined that RRTs would respond to these situations:

- Concern on the part of the RN (including "gut feeling") or the patient's family
- An acute change in the patient's respiratory status (i.e., fewer than eight breaths a minute; more than 28 breaths a minute)
- An acute change in the patient's heart rate (i.e., fewer than 40 beats a minute; more than 130 beats a minute)
- An acute change in the patient's blood pressure (i.e., a systolic reading of less than 90 millimeters)
- An acute change in the patient's urine output (i.e., less than 50 cubic centimeters in four hours)
- Acute mental status change
- Acute chest pain
- Rapidly increasing oxygen requirements
- An acute loss of pulse, color, or ability to

*Six Sigma is a method for eliminating defects in processes. For more information, see www.isixsigma.com/sixsigma/six_sigma.asp.

†The *Getting Started Kit* can be found at www.ihl.org/NR/rdonlyres/6541BE00-00BC-4AD8-A049-CD76EDESf171/0/RRTHowtoGuideKathyUpdatev19postedtoweb60806.doc.

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move extremities

- Acute stroke symptoms
- Acute significant bleeding
- Seizures
- Failure to respond to treatment

Policy and Procedure The Policy and Procedure Subcommittee created a systemwide RRT policy and developed a generic procedure for it that could be tailored to individual hospital needs. All 12 hospitals agreed to implement the policy with no more than minimal changes. The generic procedure comprised these four steps:

- The primary RN activates the RRT when she or he assesses a patient and identifies specific symptoms.
- The RRT responds to the RN's call within five minutes, assesses the situation, and activates standing hospital emergency protocols as needed to stabilize the patient.
- The RRT collaborates with the primary RN to assess the patient's condition and determine the appropriate care setting and treatment.
- The RRT collaborates with the primary RN to communicate with the attending physician, receive appropriate orders, and either effectively treat the patient or transfer him or her to a higher level of care. The RRT and primary RN communicate their findings, clearly and concisely by using the SBAR (situation, background, assessment, recommendations) technique, to all caregivers.

Communication Communication is crucial to the success of any initiative. In this case, hospital staff and physicians needed to understand the purpose, expectations, and timing of the RRT program, as well as how it might affect existing care processes.

The Communication Subcommittee developed various tools with which physicians and staff

members could be informed about the new program. These tools included such traditional means as newsletter articles, "blast" e-mails, and posters; as well as innovative ideas, such as balloons with the RRT phone number printed on them, RRT fairs, and laminated cards (listing the criteria for calling the RRT, as well as the phone number) that could be attached to name badges. The communication tools were customized to fit each facility, depending on the preferred communication method of the facility's staff and physicians.

Measurement/Outcomes The Measurement/Outcomes Subcommittee identified the data needed to monitor program effectiveness and developed data-collection and -reporting methodologies. The subcommittee decided that the data to be collected were:

- The number of RRT calls
- The number of non-ICU "code blue" calls
- Crude mortality*

Regulatory/Legal Matters The Regulatory/Legal Matters Subcommittee met with legal counsel and risk managers to identify any potential regulatory and legal concerns involving the RRT and its processes and forms.

Education The Education Subcommittee included an educator from each of the 12 hospitals. The educators developed staff- and physician-education tools and defined the process to be followed in educating staff members. Each hospital customized the education tools according to its preferred education method. The subcommittee also developed a competency-assessment program for RRT members.

EARLY RESULTS

Centura's RRT program "went live" in July 2005. In the following six months, RRTs were activated in the system 247 times. Anecdotal feedback from staff and physicians has been very positive. Although some people worried that participation on an RRT would take clinicians away from their regularly assigned patients for long periods of time, this has not happened. In fact, Centura RRTs can generally assess and treat (or transfer) patients within five to 45 minutes of

*The crude mortality rate is the rate of death from all causes in a given population in a given period of time. It is calculated by dividing the total number of deaths by the total population and then multiplying by 100,000.

ABOUT CENTURA HEALTH

Colorado's largest health care provider, Centura Health comprises 12 hospitals, eight senior living residences, medical clinics, Flight for Life Colorado (an air ambulance service), home care, and hospice services. A not-for-profit, faith-based organization, Centura Health is a joint-venture organization formed in 1996 by Catholic Health Initiatives-Colorado and Adventist Health System. Centura Health provides care for more than a half-million people each year and is Colorado's fourth largest private employer with more than 12,000 associates. For more information about the system, see www.centura.org.

being activated.

Best of all, the system's total number of non-ICU "code blues" fell 22 percent after implementation of RRTs. Its crude mortality rate declined from 1.85 percent to 1.68 percent (a 9.25 percent improvement). The change in crude mortality was statistically significant ($P < 0.032$) and equated to 75 lives saved over a six-month period (see Table).

AN EFFECTIVE SERVICE

Based on early systemwide and facility-specific data, RRTs appear effective in preventing adverse outcomes, including mortality, associated with cardiac arrests in non-ICU settings. RRT members, as well as non-ICU nursing staff, express high levels of satisfaction with this new service. Centura found RDMP a valuable way to focus planning and development activities and to successfully drive a standard implementation throughout 12 acute care hospitals simultaneously.

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For further information, contact P. Terrence O'Rourke, MD, at 303-804-8221 or terryo'rourke@centura.org.

Table

Measurement	July-December 2004	July-December 2005	Change
Non-ICU "code blues"	70	55	22%
Crude mortality rate*	1.85%	1.68%	9.25%

*Fisher Exact one-tailed test

NOTES

1. A. C. Cohn, et al., "Analysis of Outcomes Following In-Hospital Adult Cardiac Arrest," *Journal of Internal Medicine*, vol. 34, no. 7, July 2004, pp. 398-402.
2. J. Nurmi, et al., "Observations and Warning Signs Prior to Cardiac Arrest: Should a Medical Emergency Team Intervene Earlier?" *Acta Anaesthesiologica Scandinavica*, vol. 49, no. 5, May 2005, pp. 702-706.
3. R. Bellomo, et al., "Prospective Controlled Trial of Effect of Medical Emergency Team on Postoperative Morbidity and Mortality Rates," *Critical Care Medicine*, vol. 32, no. 4, April 2004, pp. 916-921.