

# Nurse Leaders as Disruptive Innovators in Cardiopulmonary Resuscitation Competency

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Improving the rate of survival among the 209,000 patients with an in-hospital cardiac arrest (IHCA) each year in the United States<sup>1</sup> depends on the provision of high quality cardiopulmonary resuscitation (CPR). Leading health care advisories, such as those of the Institute of Medicine<sup>2</sup> and the American Heart Association (AHA),<sup>3</sup> suggest that the current survival

rate of 22.3% from IHCA<sup>4</sup> can be improved through organization- and systems-level continuous quality improvement initiatives. As a result of the high number of arrests with low survival rates and new initiatives focusing on continuous improvement, likely cardiac arrest and the provision of high quality CPR will be a Centers for Medicare & Medicaid core measure.

Improving the care of patients experiencing cardiac arrest begins with training providers to effectively deliver high quality CPR. Even with sophisticated simulation- and voice-assisted manikins, the variability in survival rates between and among health care organizations suggests that the quality of CPR education needs improvement. Over the past decade, the AHA has added new and innovative methods for training CPR providers. Before the development of the AHA HeartCode™ programs, CPR providers attend classroom-based training courses consisting of lectures, video modules, skill practice, and testing with a CPR manikin. The fast-paced nature of the basic life support (BLS) renewal course allows for minimal differentiation of instruction to meet the diverse needs of all learners and levels of skill performance.

Development of the AHA HeartCode programs removed the didactic component of life support training from the classroom and placed it online for providers to complete at their own convenience and pace. The incorporation of game-based case scenarios with avatars provides a method of engaging the learner with the educational material in an active manner. Following completion of each scenario, the provider receives individualized feedback on correct and incorrect actions. For those requiring extensive feedback, the scenario is repeated until the provider achieves a passing score. An additional advantage is that the provider can review case scenarios at any time over a 2-year period.

After successful completion of the traditional classroom-based training course, or the HeartCode program, providers register for an instructor-led skills practice and testing session conducted by a certified AHA BLS instructor. Alternatively, the provider may complete the skill practice and testing session on a manikin that provides real-time feedback to the provider on the quality of skills. After successful skills demonstration, the provider receives a CPR card valid for 2 years.

CPR skills begin to decay quickly following initial training without on-going reinforcement; however, research is inconclusive as to the exact point at which skill decay begins. What research does suggest is that more frequent provider training is required for competence in high quality CPR skill performance.<sup>5,6</sup> Further, the 2015 AHA Guidelines for CPR and Emergency Cardiovascular Care noted that current 2-year training intervals are suboptimal.<sup>3</sup> Combined with evidence suggesting the need for more standardized evaluation of provider skills,<sup>7,8</sup> the newest AHA innovation, the Resuscitation Quality Improvement (RQI)™ program, incorporates both standardized real-time evaluation of CPR skill performance with training on a more frequent basis to improve CPR provider competence in skill performance during an actual resuscitation.

## THEORY TO PRACTICE: TRANSLATION

As a twice-designated Magnet® organization, innovation and new knowledge are embedded as part of our culture throughout the organization. The professional practice model (based on Joanne Duffy's Quality Caring Theory)<sup>9</sup>, the competency model (based on Donna Wright's Competency Model)<sup>10</sup>, and Ray's theory of Bureaucratic Caring<sup>11</sup> framed the decision to pursue an innovation in the context of quality, efficiency, financial and

high reliability outcomes as part of a dynamic conversation between humanistic caring and its antithesis. The theory recognizes that nursing is a part of an ecosystem that includes legal, economic, political, and technology components, making them complex systems that are driven by multiple stakeholders, dynamics, cultures, and bureaucracy.

Ray's theory acknowledges the paradoxical struggle of nurses in meeting the needs of patients and the need to balance that with modern health care system economic pressures like never before. The triple aim has challenged nurses to be a part of transforming the health care system to provide better outcomes for patients and populations while achieving lower cost per capita. However, the overarching moral imperative of providing care that is evidence based, cost efficient, equitable, and patient centered has not changed. It does, however, produce new challenges to executives in the current transformation of the health care system driven in large part by the Affordable Care Act and the triple aim.

The professional practice model and nursing theory can, if acculturated in the organization, assist in valuing and prioritizing financial and human resources. The common language of Duffy's Quality Caring Model allows for the vetting of proposed programs and related practice changes. The model allows for the integration of evidence-based practice with caring in order to produce the best outcomes. Reviewing new technology proposals or changes in practice through this lens allows for a clearer understanding of the effects on the nurse-patient relationship, which is sacred in the model and the foundation upon which outcomes are achieved. Technology should enhance the patient-nurse relationship by allowing for a deepening of the caring behaviors and actions that milieus create for maximal healing, which require the authentic presence of the nurse.

In addition, the organization's competency model that empowers clinicians to select and control their own competencies provided additional alignment as the future state of the program and technology allowed for real-time staff management of the agreed-upon collaborative CPR competency. The model also allowed leaders to create the conditions for success through the design of the program that encompass, not only the competency component, but the commitment component as well, related to integrating into daily work and self-accountability for performance.

Our journey to becoming a high reliability organization provides a framework for the selection of assistive technology that can better produce reliable quality outcomes. The understanding of skill-based areas in the practice of nursing as it relates to physical performance of high quality compressions could not realistically be assessed without bias until the development of the Resuscitation Quality Improvement (RQI) program. One characteristic of highly reliable organizations is that they are resilient and relentless in their pursuit of excellence. Additionally, a preoccupation with failure drives the organization forward to constantly seek innovative solutions by listening closely to frontline staff and a deference to experts. Lastly, avoiding the temptation to oversimplify the causes or reasons, actively questioning the obvious and accepting the complexity of the problems and solutions are tenets of a highly reliable organization. Considering

the RQI program from the perspective of high reliability framework made clear the need for the adoption of the innovation and to deploy the innovation to more than 2000 clinicians.

## CURRENT STATE—DISRUPTIVE INNOVATION

The Texas Health Resources Fresh A.I.R. philosophy focuses on affordability, innovation, and reliability. The RQI program is a pioneering approach to CPR maintenance and an inspired disruptive innovation. Disruptive innovation is described as an “innovation that transforms an existing market or sector by introducing simplicity, convenience, accessibility, and affordability, where complication and high cost are the status quo.”<sup>12</sup> Changing the way we practice to provide the highest quality care and decrease cost is imperative in today’s health care environment, or “Do Good, Save Money.” As health care professionals, we must re-examine what has always been and use evidence-based practices to achieve the best possible patient outcomes.

The introduction of the program into our organization was the first step in transforming this competence for providers—disrupting the status quo. With increased accessibility to training and evaluation, nurses are able to refine practice and improve their skillsets. The days of long classes with inattention to detail are over. The program is reliable and provides immediate feedback, which in turn improves quality and drives successful patient outcomes. As health care moves to reimbursement based on performance, every organization’s imperative is to discover and implement such disruptive technologies.

## FUTURE STATE—THE RQI PROGRAM

Essentially 2 programs in 1, the RQI program consists of quarterly low-dose training on the critical psychomotor skills required for optimal resuscitation of a patient experiencing cardiac arrest. Included in the RQI program subscription is an RQI Skills Station containing a computer and adult/child and infant manikins. Skill sessions include chest compressions, ventilation, and combined compressions and ventilation for the adult, child, and infant. Before attempting the skill, the provider receives brief (<3 minutes), just-in-time training on how to perform the skill. As the rescuer performs the skill, the RQI program provides audio and visual feedback that coaches the provider to high quality CPR performance based on the most current AHA algorithms for CPR. Following the skill session, the provider receives a summative score based on how far the performance deviated from the recommended AHA algorithms. If a passing score is not achieved, the provider reviews a visual dashboard for debriefing on both correct and incorrect actions and then attempts the skill again. For every quarter that the provider completes required skills successfully, the CPR card forwards 3 months, which eliminates the need for renewal CPR training. The low dose, high frequency training methodology effectively moves providers from the traditional maintenance of CPR certification to the ongoing maintenance of CPR competence.

The second component of the RQI program is an annual curriculum designed to maintain provider knowledge on the BLS and advanced cardiac life support (ACLS) algorithms of care. Although the performance of high quality CPR is certainly

the most critical component for patient survival from a cardiac arrest, the provider must also have the foundational cognitive knowledge in BLS and ACLS. Researchers suggest that the decline in knowledge that occurs following CPR training does not occur as rapidly as the decline in skills,<sup>5</sup> but starts to decay approximately 1 year following initial training. The curriculum consists of the HeartCode BLS course, and for those who are ACLS providers, the combined HeartCode BLS and HeartCode ACLS courses. As described previously, these courses use avatars and game-based case scenarios, along with multiple-choice test questions to evaluate the provider’s knowledge.

## IMPLEMENTATION OF THE INNOVATION

Implementation of the RQI program occurred through a multi-step process coordinated by a team of stakeholders including human resources (HR), clinical managers from both nursing and non-nursing areas, clinical nurses and interprofessional providers, life support instructors, and information technology (IT) services. The chief nursing officer (CNO) provided oversight on the entire process of implementation, and the RQI program coordinator was responsible for actual implementation across the organization. The first task was to gain buy-in from HR for oversight and enforcement of the new quarterly training methodology. Following buy-in from HR, we conducted a pilot test to ensure that the program integrated into the organizational IT infrastructure and to evaluate any potential problems that might occur during house-wide roll-out, and to informally gauge clinician satisfaction with the new program.

The implementation team felt that developing a team of superusers at the department and unit levels would be critical to the success of the RQI program. The program coordinator, along with approval from the CNO and the AHA, transitioned current life support instructors into their new role as superusers to support staff. Clinical nurses, working on their career advancement program portfolios, and interprofessional providers interested in participating in the program were also invited to become RQI superusers. Following extensive training on the RQI program, the superuser team began working with staff at the unit level and assisting the unit manager and program coordinator to ensure staff compliance with the quarterly activities.

Following pilot testing, the RQI program was deployed house wide. A total of 15 RQI Skill Stations were deployed to diverse clinical units and departments within the organization. The program coordinator worked with unit and department staff to identify the best location for the stations, and the life safety officer approved the final locations. The careful development of an implementation plan with evaluation of the process at every step is crucial to successful program deployment. The level of attention to every detail throughout the process ensured that minimal problems occurred during house-wide roll-out. In fact, the multistep implementation plan ensured a first-quarter completion rate of 99.7%.

## NURSE MANAGER PERSPECTIVE ON INNOVATION

As a manager, it is essential to have confidence in the unit team’s ability to respond effectively, especially during emergency situations. Having an understanding of the strengths and oppor-



tunities can assist in the creation of optimal conditions to achieve the best possible outcomes for patients, as well as to provide knowledge of how to best develop the team of interprofessional caregivers. The RQI program provides the opportunity for on-going training and feedback on CPR skills. Each quarter, as a manager, I (Josh Tippy) can count on this training to fine tune the skillset of the team in effectively maintaining their competencies over time.

Change is always difficult, and this was a major change for many of the nurses. The majority of health care professionals are accustomed to renewing their BLS/ACLS every 2 years. At first glance, it was hard to see the benefits in “renewing each quarter,” as one nurse described it, but with each quarter, the abundant rewards of the program were evident. Each nurse was able to self-identify which parts of their skillset required improvement and were able to strengthen these areas to maximize their skill and competence in CPR. As a result of the RQI program, nurses’ confidence, patient care, and interprofessional team leadership improved. In addition, the RQI analytics provided information that could be used to assess, plan, and ultimately, strengthen both individual and team performance. Further, the RQI program is financially sound. Rather than requiring staff to be off of the unit to gain CPR certification, they are able to train right on the unit to improve their practice. The program was a win-win for everyone, including the unit team, leadership, and especially the patients and families who trust us with their care.

In addition to the growth in CPR skills, the program allows for developing leaders to emerge. Unit champions are assigned to act as superusers. They help members of their team, ensure accountability for completing quarterly RQI assignments, and troubleshoot any problems. The RQI program fosters innovation and creativity, and has proven effective in spotlighting those with leadership skills. As an example, one nurse created an entire system to hold peers accountable that utilizes a visible timeline to chart everyone’s participation. This not only illustrates engagement with the program, but also inspires with an iterative reward system.

## OUTCOMES AND SUSTAINABILITY

Following the organizational implementation, CPR providers continue to complete the program at rates well over 98%. Staff voice increased confidence since starting the program 2 years ago, and feel that the program has improved their competence in CPR skill performance. Staff now embrace the RQI program and express little desire to return to the classroom-based training as the program meets their needs for maintaining competence in CPR. Further, the organization noted a significant 21% increase in survival rates following cardiac arrest based on a pre- and post-implementation study. Financially, the organization continues to benefit with a savings of over \$250,000 per year in training costs.

Perhaps most importantly is the ability of the organization to meet its mission of improving the health of people in the communities served while meeting the standards and outcomes of the Magnet Recognition Program® by being aligned with the professional practice model and the competency model. Nurses are innovators as demonstrated time and time again, and as leaders, must be positioned to innovate existing care and create new

models of care with competencies to support improvements. Of equal importance is the role of the nurse in dissemination of innovations beyond their organizations and professions to influence health care at a national and international level. Since the implementation at Texas Health, 2 facilities in Australia and 10 American hospitals have fully implemented the program, many supported by the lessons learned, site visits, and consultations provided by the authors.

Modern health care demands innovations that span the spectrum of incremental to revolutionary and the organizations adoption of the AHA RQI total program meets that demand in addition to the triple aim of health care.

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