2017 Full Submission

Title: Implementing an Interprofessional Hospital Emergency Response Training Team

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Focused Question: Can educational and operational initiatives spearheaded by an interprofessional emergency response training team (ERTT) improve care for critically ill patients, foster communication, build resilience and provide consistent education with real time feedback for learners, staff and faculty at Duke Regional Hospital?

Background: Hospitals utilize Emergency Response Teams to ensure prompt response to a critical situation. At Duke Regional Hospital (DRH), a Code Blue alert signifies a cardiac or pulmonary arrest, a Rapid Response Team (RRT) indicates a deteriorating patient, and a Code Stroke signals acute neurologic changes that may represent a stroke. While responses to different Emergency Response Team calls vary, the calls themselves are infrequent, high stress, fast paced, and emotionally charged events. The 2013 Consensus Statement from the American Heart Association, extrapolated only about 200,000 in-hospital cardiac arrests occurred annually in the US. At DRH, from July 2016 through April 2017, 66 code blues were called (excludes the Intensive Care Unit, Emergency Department and Operating Rooms). The "100,000 Lives" Campaign at the Institute for Health Improvement National Forum in 2004 included the deployment of rapid response teams (RRT) to improve patient outcomes as one of its six key interventions. At DRH, from May 2016-May 2017, 650 rapid responses were called. While more common, RRTs encompass a wide range of clinical conditions and are less algorithmic, leading to gaps in communication, unclear expectations of roles, and creating more stress for staff.

Simulation based education plays a key role in airline and military training and in recent years has become a key component of healthcare provider training. The success of a code blue, code stroke, or rapid response is dependent on teamwork and effective communication. Simulation training allows staff to ask questions while strengthening their clinical skills in a low stress and safe learning environment that serves to reduce burnout, build resilience, promote confidence and foster educational development as a team. Furthermore, simulation of these rare events can even improve patient outcomes. In a study of a pediatric code simulation program at the University of Michigan, researchers showed an improvement in survival rates to 50%, an increase from the national average. Adherence to the

Advanced Cardiac Life Support (ACLS) algorithm is essential to improve patient outcomes, however this training doesn't focus on other key components that are known to improve patient care including teamwork, effective communication and debriefing.

The DRH Emergency Response Training Team (ERTT) is an interprofessional team comprised of physicians, nurses, and nurse educators dedicated to shaping the way teams respond to and learn from rapid responses and codes. The DRH ERTT began in December 2014 as a grassroots effort by a few nurses and physicians to facilitate sustainable simulation training for emergency responses at DRH. The ERTT has grown to include Educational Services and ICU teams. DRH ERTT performs unit based and hospital wide code simulations and regularly visits units or staff meetings to perform in-service training. In the past year, the ERTT has run approximately 10 simulated code blue and code blue in-services, and 4 simulated code stroke and code stroke in-services involving nurses, nursing assistants, respiratory therapists, physicians and students in all disciplines. Funding would facilitate purchase of equipment and provide resources to support further development and data collection for the DRH ERTT program.

Specific Aims:

1. Evaluate changes in knowledge and comfort level for emergency responses.
2. Measure changes in emergency response times and metrics.
3. Assess effects of interventions on resilience and wellbeing.
4. Estimate the effect of interventions on patient outcomes.

Methods:

Evaluate changes in knowledge and comfort level for emergency responses.

The DRH Emergency Response Training Team (ERTT) has developed anonymous Qualtrics surveys that measure knowledge of ACLS algorithms, familiarity with code cart, defibrillator operation, self-confidence during emergencies, and perceptions of leadership and teamwork. These surveys will be utilized to quantify changes after ERTT interventions and identify educational gaps. Surveys will be distributed to a wide range of staff including nurses, physicians, students, residents, nursing assistants, and other first responders. Two API numbers dedicated to ERTT training have been obtained to evaluate the quantity and roles of individuals touched by simulator and in-service training.

Measure changes in emergency response times and metrics.

Monthly in-hospital unannounced code blue and rapid response simulations will be conducted. The ERTT will set up the simulator equipment in the room (detailed below in the budget), measure response times to key therapy or decision points (i.e. currently measure time to arrival, time to compressions, fraction of time CPR administered, time to first defibrillation, time to first medication, effective communication, and presence of clear leadership for ACLS simulation), and conduct debriefing session.

Participant will periodically complete the Team Emergency Assessment Measure (TEAM),a validated tool to assess team performance during simulated cardiac arrest.

Assess effects of interventions on resilience and wellbeing.

Interprofessional meals will be hosted on each unit to debrief about recent code blue and rapid response experiences. The staff on each unit and members of the hospitalist group, resident teams, and critical care teams will be invited. In addition, we will host an interprofessional hospital medicine Journal Club and Morbidity & Mortality conference with nursing, pharmacy, and critical care partners focused on improving communication and teamwork in the care of decompensating patients. We hypothesize that improved education, stronger teamwork, and better communication will reduce stress, leading to improved resilience and wellbeing. Changes in wellbeing and resilience will be measured by periodic evaluations using a short Warwich-Endiburgh Mental Wellbeing Scale (WEMWBS) and a brief burnout assessment tool found to correlate well with the full Maslach Burnout Inventory (MBI) for healthcare providers.

Estimate the effect of interventions on patient outcomes.

The ERTT has collaborated with the ICU team to perform retrospective chart reviews of in-hospital cardiac arrest. This will allow for assessment of ERTT interventions on patient outcomes. A REDCap database has been developed to collect information about the Charlson Comorbidity score , GO-FAR (Good Outcome Following attempted Resuscitation) , CPC score (Cerebral Performance Score) , and survival at 24-hours and to hospital discharge before and 1-year after ERTT interventions. Biostatistical consultants will be utilized to assess the effect of ERTT interventions on patient outcomes.

Data management plan:

We expect participant variability in response to emailed surveys/assessments will introduce bias. Thus, these data will be collected by regularly rounding on units using tablets to obtain a better cross-section of learners, staff, and faculty. Survey data and assessment scores will be collected anonymously, doesn't include protected health information, and will be presented in aggregate. Simulation data will be collected in real time using tablets to improve data capture efficiency and limit transcription errors. All data extracted will be stored on password protected, encrypted computers/tablets using Duke preferred databases (REDCap, Qualtrics) and cloud based storage (Duke Box). Data collected by chart review will be de-identified and stored in a REDCap database, minimizing risk of loss of confidentially.

IRB status: Approved – PRO00080900

Challenges: While this is an industrious project, all of the pieces are in place for it to be successful. Current challenges include lack of resources for dedicated equipment and statistical support, a significant time burden to plan and execute educational and simulation events, case review and survey administration. Support for 3 hospitalists dedicated to this project will support division of labor. Successful education requires the buy-in and time of busy staff. We hope to encourage support by offering rewards for participation and hosting debriefing sessions around food. Lastly, a paucity of data

supports improved patient outcomes in simulation programs and it will require rigorous data collection to achieve this aim. We believe the benefits of improved communication and teambuilding support this funding.

Budget Template:

PI Effort	$2400	Three co-PIs $800 each for 30 hours per person over 12 months
Consult costs:	$1500	Biostat consultant
Equipment:	$2420	Training code cart, ACLS dummy, ACLS simulator, rapid response box & contents, code cart contents
Supplies:	$1680	Timers x 5, poster/attendance at Safety conference, prizes/rewards for staff, case review luncheons, case review breakfasts
Computer	$1000	3 tablets for training/data collection
Travel:	$1000	Travel to SHM or ACP
Total Requested:	$10,000	

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