

Re-sternotomy simulation based nursing



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Introduction

Emergency re-sternotomy in the post-cardiac surgical patient is performed at the bedside following cardiac arrest. Current cardiac surgical unit advanced life support (CSU-ALS) suggests that CPR alone is ineffective for treatment in patients with tamponade and hypovolemia (Michaelis and Leone, 2019).

Immediate re-sternotomy will help to restore a pulse and maintain adequate cerebral perfusion by decompressing the chest (Michaelis and Leone, 2019).

If the chest is opened within ten minutes, common causes of arrest during the postoperative recovery period are reversible (Stueben, 2017). The amount of time it takes to open the chest has been found to be a critical component of patient survival (Stueben, 2017). According to McRae, Chan, Hulett, Lee, and Coleman (2017) “ there is a 48% survival to discharge rate amongst those re-opened within 10 minutes, compared to 12% in those re-opened after 10 minutes” (p. 64). The re-sternotomy procedure requires coordinated care from nursing and the cardiac surgery team in the intensive care unit. This is an infrequent event but one that requires a rapid response incorporating high level resuscitation skills. The change proposed is to prepare and educate nursing staff in the cardiac surgical unit on emergency re-sternotomy by beginning simulation based training.

Justification of the Need for Change

Emergency re-sternotomy is an infrequent event only occurring a few times a year. Due to its infrequent occurrence, nurses rarely have the experience needed to assist with an emergency re-sternotomy procedure. When these emergencies occur, even with best efforts there is a feeling of chaos that

occurs. Cardiac surgery nurses know what to do in a code situation, but when it comes to re-sternotomy there is a lack of organization, team roles, and training. There is currently no education on the surgical sternotomy supply kit or the order in which the tools are needed. All nurses who work on this unit are certified by The American Heart Association in advance cardiac life support and emergency re-sternotomy is not part of this training. Even with a lack of experience and training, nurses are still expected to know the tools needed, the process of opening the chest, and how to respond during this emergency. The lack of re-sternotomy or open chest training at the bedside has brought attention to the need for further education in this area. These emergencies are emotionally and physically demanding and require advanced preparation to support best outcomes.

The Society of Thoracic Surgeons (STS) and The European Association for Cardio-Thoracic Surgery (EACTS) is the current protocol regarding re-sternotomy in patients who go into cardiac arrest after cardiac surgery. The STS/EACTS protocol is the guideline and standard of care for emergency re-sternotomy in the United States (Michaelis and Leone, 2019). The EACTS protocol is included within the cardiac surgical unit and differs from ACLS algorithm guidelines. This protocol should be followed when resuscitating a patient in cardiac arrest post cardiac surgery. Emergency re-sternotomy is a standard component of this resuscitation protocol. There are six key roles for clinical staff responding to this emergency (Michaelis and Leone, 2019). After a code blue is called; the first role is to begin CPR and notify the cardiac surgeon. The second objective is to maintain airway and breathing. The third person manages the defibrillator or pacemaker. The fourth step is to identify

a team leader, usually a nurse practitioner or physician assistant, who makes sure the arrest protocol is being followed. The team leader focuses on each role and prepares the team for rapid re-sternotomy. The fifth step is drug administration. The sixth step is a coordinator usually a charge nurse who manages activities other than those at the bedside and focuses on the operational aspects of the resuscitation. The charge nurse is responsible for documentation and retrieving the chest kit. This is where the ACLS protocol becomes the STS/EACTS protocol. In addition to the six team members, a re-sternotomy team should immediately begin preparing a sterile field and don gowns and gloves. The re-sternotomy team should respond as soon as the arrest is identified and should be ready to perform a sternotomy within 5 minutes of arrest (Michaelis and Leone, 2019). Guidelines indicate that re-sternotomy is mandatory if external CPR does not maintain a systolic pressure of at least 60mm Hg (Michaelis and Leone, 2019). Implementing these guidelines will positively affect survival to hospital discharge and will improve the management of arrest in cardiac surgical patients.

The current status of an emergency re-sternotomy procedure is unorganized. Nurses are running to the operating room to get an open chest kit. Surgeons are scrubbing in and preparing the patient. Immense pressure is placed on the cardiac surgeon to voice and explain what is needed and what should be done. There is a lack of team roles; including who will assist the surgeon, who will document, and who will be the “runner”. To control this chaotic environment training is needed to care for these complex patients. The implementation of simulation will assist with this by providing a controlled environment where the healthcare team can practice and become familiar

with the process. Clinical experts will facilitate the mock re-sternotomy scenario as a solution to this identified problem.

It is recommended by STS/EACTS protocol to regularly train for open-chest code drills on all shifts (Michaelis and Leone, 2019). Simulation is a way to promote continuing education and to teach new procedures. According to McRae et al. (2016) “ The American Heart Association recommend regular scenario training for significant and rare non-routine events” (p. 64).

Simulation increases knowledge by providing a safe environment for nurses to practice and ask questions. This hands on learning will empower nurses to be in control during this emergency and increase job satisfaction. The training that will be offered will follow the guidelines written by STS/EACTS that uses evidence based recommendations (Melia, Ruberti, Smith, and Owen, 2018). Simulation following these guidelines will give nurses the opportunity to gain confidence in this procedure by practicing the necessary skills and life saving measures needed to help assist the cardiac surgeon. Group simulation will build teamwork, increase nursing morale, and interaction among staff. Following simulation, debriefings are important to reflect and discuss what skills need to be improved on and provide an opportunity to ask questions. The goal of simulation is to improve patient outcomes by improving team response to emergency re-sternotomy.

Change Theory

Healthcare organizations and professional practice are continuously changing and evolving. In order to adapt to these changes, processes need to be formed and key principles of organizational change need to be adhered

to (Roussel, Thomas, and Harris, 2016). The principles of organizational change include strategic planning, execution of the proposal, commitment from staff and stakeholders, and adherence to the vision of the organization (Roussel, Thomas, and Harris, 2016). Nurses may be resistant to this training for fear of lack of knowledge in a group learning environment or required training time. Leadership and nursing staff need to leverage forces to move change. A way to do this is to educate staff so that they have an understanding of the proposed simulation training. Change is accomplished when staff is committed and engaged in the change and believe that the change will have a positive effect on patient care and staff morale (Roussel, Thomas, and Harris, 2016).

Change theories are used in healthcare as a guide to assist in the implementation of a new plan (Mitchell, 2014). Lippitt's change theory will be used as a framework for this project proposal. Lippitt's change theory includes seven phases and is composed of four elements: Assessment, planning, implementation, and evaluation (Mitchell, 2013). Lippitt's theory contains a detailed process plan that will help to develop, initiate, and train staff in implementation of re-sternotomy simulation education. This theory also develops a change agent who will help direct and facilitate the simulation implementation. A change agent is important in this situation as support will be needed to guide this proposal. Phase one is to develop a detailed plan to address the issue (Mitchell, 2013). During this phase there will be a meeting with key stakeholders to discuss the identified problem and proposal. The healthcare staff will need to be educated on the need for this training and why it will be beneficial. To begin simulation based training

there needs to be support from key stake holders including the director of nursing, nursing educator, cardiac surgeon, hospital community, and nursing staff. This simulation will need commitment from the director of nursing (change agent) and instruction by the nursing educator. Phase two is to communicate and justify the need for change, concerns, and possible resistance (Mitchell, 2013). This involves communicating with nursing staff and those who will be affected by this proposal. This phase also includes discussing resources needed such as: the timing of education, location of education, and costs of equipment. Phase three is to identify a change agent who will help direct and facilitate the change implementation (Mitchell, 2013). The change agent for this proposal will be the director of nursing of the cardiac surgery unit. Phase four is to form policies, assign roles, and create a timeline for implementation (Mitchell, 2013). Nurses will need to know what is expected of them and when training will begin. Phase five is to define the role of the change agent and how they will assist in the implementation process (Mitchell, 2013). The change agent (director of nursing) will initiate and develop a plan with the unit nursing educator to implement simulation. The nursing educator will begin to train staff nurses. Phase six is the maintenance phase with continued support from the change agent (Mitchell, 2013). This phase maintains the change by ongoing simulation training. Phase seven is when the change agent withdraws from the process once its fully implemented (Mitchell, 2013). During this phase the director of nursing will withdraw from the simulation training proposal and the nursing educator will continue to develop the program.

Pre-Implementation Plan

The following will discuss the recommended steps that will be needed to implement and address the need for re-sternotomy simulation training.

Beginning simulation training will promote team work and improve the response time and quality of care given to each patient.

Patient and Nurse Safety

Healthcare organizations aim to prevent errors and adverse events. Safety is the number one priority and nurses have an important role in ensuring patients are safe. Nurses are responsible for monitoring patients for clinical deteriorations, detecting errors, and understanding care processes

(Sherwood and Barnsteiner, 2017). Nursing staff should become familiar with their role in this emergency and are working within their scope of practice.

Nurses need to follow the hospitals policy regarding accountability for staff to take part in training and education to ensure readiness during a clinical emergency. To prevent safety sentinel events, there needs to be a

standardized chest emergency cart. This cart will need to be kept and maintained on the unit so that it is readily available. The charge nurse on the

day shift will be responsible for checking this kit to make sure all supplies are present and not outdated. Frequent checking of this cart will maintain

patient safety and adhere to joint commissions accreditation policies. The

Joint Commission recommends regular maintenance and inspection of all code carts so that they are ready in an emergency (The Joint Commission,

2017). A cart consisting of all surgical tools needed for re-sternotomy should be standardized and kept on the code cart. The tools needed for re-

sternotomy include a scalpel, a wire cutter, a heavy needle holder, a single-piece retractor, and a sterile suction cannula. (Michaelis and Leone, 2019).

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Staff should become familiar with the contents of the cart and what order each tool will be needed. The cardiac surgeon will be the one to explain what is needed during the process of this procedure and give feedback.

Information Management Systems

Information management can help to ensure that data is entered correctly and valuable patient information is secure (McGonigle and Mastrian, 2018) . Health information technology, is used in healthcare as it can better coordinate patient care with other providers through the secure and private sharing of clinical information. Communication in this organization is done through email and an enterprise notification paging system.

Technology is needed to process vital data and information. This data is needed to support all types of nursing activities and daily care planning. Information technology is used to facilitate and identify key nursing processes that can positively affect patient care. This healthcare organization keeps all policies and procedures in the hospital's intranet. This makes accessing this information convenient for all staff. With the implementation of this proposal, staff will be encouraged to access the simulation and re-sternotomy policy and procedures. To begin simulation a mannikin and code simulator will be needed. The hospital education department currently owns both. To simulate re-sternotomy a manikin that mimics an open chest will be needed to be kept in the cardiac surgery unit. Another alternative to this is to share a manikin with the education department to save costs. The downfall to this option is that the manikin may not be available to use when needed. The costs of purchasing a manikin

or using an already available manikin will be included in the implementation plan.

Health Literacy

This proposal will support health literacy by offering several modes of learning.

An instructional video pertaining to chest re-opening will be viewed before simulation. Nurses will begin with classroom education including learning the protocol and the roles within the arrest team followed by the simulation training. Videos, pamphlets and hands on demonstrations of tools and equipment needed will be including in this training. Each member of the cardiac team will have time rotating between roles and practicing sterile technique. Algorithm posters and cards on the process of an emergency re-sternotomy procedure should be kept in the break room and clinical areas. Debriefing and reflection will also be valuable learning tool post simulation. Regular education and simulation training will lead to increased familiarity and adherence to guidelines with improved outcomes.

Administrative Policies

Health care delivery uses policies, maintains policy standards, and stays current with best practice. Healthcare delivery systems maintain policy standards by developing new and improved methods of care delivery, treatments, and cutting-edge research (Roussel, Thomas, and Harris, 2016). Updating and maintaining policy standards is necessary to ensure consistency for quality measurement and improvement. The Joint

Commission accreditation involves monitoring facilities and providing information to promote safety, change, and ensure legal compliance and quality services (The Joint Commission, Hospital Accreditation, 2019). Policies and procedures are maintained to guide desired outcomes and safe patient care.

The following staff will be valuable to the success of this proposal. The director of nursing will be the change agent and will be the resource to assist with financing the proposal and scheduling employees. The nursing educator will facilitate the education and simulation along with the cardiac surgeon. Each nurse in this unit rotates into the charge role. It is important that all nurses during simulation rotate and practice each stage of the emergency. This includes documentation, a “runner”, and act as the nurse who scrubs in to assist the surgeon. All nurses are considered equal despite their years of nursing experience. It is important that all staff and management work together in a cohesive environment to foster a positive learning experience.

Healthcare Equity

The Office of Disease Prevention and Health Promotion (2019) includes Healthy People 2020, defined “health equity as attainment of the highest level of health for all people” (para. 5). This healthcare organization promotes diversity, inclusion and equity to effectively engage employees. This plan will promote an environment where individual traits and learning styles will be tailored for success. The clinical team will be treated equal and will be valued for contributing ideas that will foster collaboration.

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