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IMPLEMENTING CHANGE IN THE CARDIAC OPERATING ROOMS

Systems Change Project
Submitted in Partial Fulfillment
Of the Requirements for the Degree of
Doctor of Nursing Practice

St. Catherine University
St. Paul, Minnesota

Amy Wermager White

May 2012

ST. CATHERINE UNIVERSITY

ST. PAUL, MINNESOTA

This is to certify that I have examined this
Doctor of Nursing Practice systems change project
written by

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and have found that it is complete and satisfactory in all respects,
and that any and all revisions required by
the final examining committee have been made.

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May 18, 2012

Date

DEPARTMENT OF NURSING

Amy Wermager White 2012

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Executive Summary

Change is occurring rapidly throughout healthcare. The effects of these changes are felt at the global, national, state, and organizational level. At a large, Midwest teaching institution, there are many initiatives that must be implemented throughout the organization quickly. In this organization, eight cardiac operating rooms are constantly experiencing change. Successful implementation of changes in policies, procedures, and practice is essential to providing the best possible care for the patients in cardiac surgery.

The purpose of this system change project was to increase staff involvement in the change process by discussing barriers to implementation, and allowing cardiac surgery staff to successfully implement, embed and sustain change within a system. The staff included the registered nurses, certified surgical technologists, and certified surgical assistants that work in the cardiac operating rooms.

The project utilized action research and a quality improvement framework using mixed methods. It involved two phases. Phase I was a qualitative design used to gain an understanding of the perceptions of registered nurses, certified surgical technologists, and certified surgical assistants in the cardiac operating rooms about the current process for communicating and implementing changes in policies, procedures, and practice. Phase II involved implementing the solutions identified by the cardiac surgery staff and evaluating the outcomes.

The three solutions implemented were (a) to provide staff information on changes before they will be implemented, (b) to utilize electronic resources for surgeon preferences, and (c) to implement a communication board in the cardiac office. Only the effectiveness of the process for updating surgeon preferences ($\chi^2 = 18.83$; $p=.001$) was found to be statistically significant. Although not statistically significant, there were positive trends for all of the solutions.

Understanding how the process for communicating and implementing changes affect staff can help guide future initiatives. Integrating individuals in the process of change from the beginning provides the opportunity for staff engagement. When staff feel they have ownership of the process, successful adoption of change is likely to follow.

This systems change project has laid the groundwork for future work in change implementation, and provided an opportunity for future improvements in the cardiac operating rooms. Additional research is needed to understand what creates resistance in groups. Also, more information is needed on how change processes should occur. It will be essential to continue work related to change implementation to build the knowledge base as to what works best for the organization, so the best care is provided to patients.

Chapter 1

Introduction

Change is constant in the health care environment. Health care resources are limited. Evolution of technology and other advances in health care has impacted the use of health care resources worldwide. Global health funding is decreasing, and stakeholders must find creative ways to do more with fewer resources. All countries must coordinate their efforts to help sustain progress in global health initiatives, such as maternal and child health. Large organizations, government and non-government agencies, local communities, and individuals all play a part in global health (Kaiser Family Foundation, 2009).

The United States is also seeing dramatic changes in healthcare. With the Affordable Care Act signed in 2010, new policies have gone into effect. Access for young adults to healthcare under their parents plan has been expanded to age 26. Programs have been implemented to improve the health of Americans, such as free preventive care and programs to help with smoking cessation. New ways of providing care are being tested. There has been increased access to home and community care (U.S. Department of Health and Human Services, 2012). All of the new policies mentioned, and the multitude of others not discussed, require health care organizations to deliver care differently.

Organizations are faced with managing changes occurring in the global and national healthcare arenas, as well as at the state, local, and organization levels. Reimbursement from Medicare in the United States is changing. Many states require adverse events to be reported, and processes must be adapted in response to such events. As standards of practice are updated based on current evidence, organizational policies and procedures need to be modified. Technology is rapidly evolving, and patients expect to be offered the most current, advanced technologies

available. In order to continue providing quality, cost-effective care in the evolving healthcare environment, organizations will have to change the way in which they work.

According to Bruckman (2008) the more changes that occur in a shorter period of time, the more stress the organization will experience. As a system, organizations can experience stress due to rapid changes within their subsystems. For example, in an acute care hospital, operating rooms are one such subsystem. The operating room environment is rapidly changing, which may create a stressful practice environment. Healthcare workers must be prepared for the unexpected that can occur during a procedure. Frequent modifications to policies and procedures in this environment add to the stress and frustration of healthcare workers. Staff do not always understand the rationale for the new policy or procedure, and may also not agree with it. This may lead to resistance. Planning ahead and considering what employee's reactions may be could prevent this resistance from occurring (Van Dam, Oreg, & Schyns, 2008). New technology leads to modifications in the products and equipment that healthcare workers may have used for many years. These may increase the chance for error if the healthcare workers do not fully understand the functions and utility of a new product or equipment. They may also not engage in the change process itself to adapt the new product or equipment, which may lead to confusion and frustration with other healthcare workers.

Organizational Background

This project took place in a large Midwest teaching institution and a Level I trauma center. This organization is seen as a leading healthcare institution in the United States for healthcare delivery. The mission of the organization is to inspire hope and contribute to health and well-being by providing the best care to every patient. The primary value of the organization

states that the needs of the patient come first. The other values of the organization include respect, compassion, integrity, healing, teamwork, excellence, innovation, and stewardship.

Organizational Structure

There are many divisions within the organization. This project took place in the Division of Surgical Services, which consists of more than 120 operating rooms and procedural areas across two hospitals and an outpatient surgical practice. The operating rooms are staffed 24 hours a day, seven days a week. Surgical specialties include general, otorhinolaryngology, ophthalmology, plastics, oral, maxillofacial, pediatrics, urology, orthopedics, neurology, thoracic, vascular, cardiac, gynecology, invitro, infertility, colon rectal, and transplant. In 2010, there were more than 63,000 surgical procedures performed across all sites.

There are eight cardiac operating rooms in the Division of Surgical Services. Cardiac surgeons perform congenital and adult cardiac procedures. An average of twelve procedures is completed daily. The staff that work in the cardiac operating rooms are experts in cardiac surgery, and this is their primary role. The staff also provides care to patients across all specialties in the Division of Surgical Services. The Division of Surgical Services and the organization are constantly striving to be the best and the most cost-efficient. This is evident by the amount of change that the division and the cardiac operating rooms experience.

Organizational Change Initiatives

There have been multiple changes that have occurred as the result of an initiative to reduce costs throughout the cardiac surgery experience, and have affected staff in many ways. All classifications of staff, including registered nurses, certified surgical technologists, and certified surgical assistants, had to alter the way in which they work. Their work schedules were adapted so that they are coming in at different times than they were accustomed. New work

schedules have affected the staff outside of work – they may have had to rearrange such things as family, sports, and daycare schedules. Staff typically had a specific surgeon who they always worked for, but with the new design, they can be working for multiple surgeons. Staff roles have been redefined to include doing tasks they previously did not perform. For example, all staff are expected to assist in opening supplies and equipment, which was previously mainly a registered nurse task. Working for different surgeons and role tasks may have caused an emotional burden on the staff, since they had to learn new preferences and tasks in a short period of time.

Along with the cost reduction initiative at this institution, practice, policies, procedures, products and equipment are frequently altered. Many changes are initiated by the organization and/or the Division of Surgical Services. These changes affect all staff across all departments in the Division of Surgical Services. The cardiac leadership team is responsible for implementing the changes in the cardiac operating rooms. In addition, there are also changes that affect only the cardiac department, and the leadership team is also responsible to ensure these changes are implemented.

Organizational timing of change initiatives and staff morale. Many of the changes are unpredictable for staff. The time and rate at which the changes are implemented is also unpredictable. Staff is expected to remain up to date on the current practice. There are some changes that are expected to be incorporated into practice immediately when they are announced.

At the start of the cost reduction initiative, morale began to decline. There were shifts in tasks that led to discontent among the classifications, as there are different expectations amongst the group as to what each classification should be doing. The shift in tasks also caused discomfort for the staff, as they are expected to do things they were not accustomed to performing. There have been several large group meetings to provide updates on the project and

allow for questions, and only a few of the staff speak-up, and those who do speak-up do not represent all classifications.

Small groups have tried to work on teambuilding initiatives, which have been openly rejected by some, leading to further discontent and turmoil. When an individual speaks up, the rest of that classification is viewed as having the same belief. Trust is one of the keys for successful change (Donahue, 2008). There continues to be distrust among classifications.

Problem Statement

Change occurs daily in the cardiac operating rooms, and affects many classifications of staff. There are changes to policies and procedures, process and/or practice changes, and new technology and equipment. The rate at which change is implemented is unpredictable. Staff does not always have a voice in the change process. Morale is low amongst some of the staff. The organization seeks to provide the best care possible for each patient. Implementing changes in a way that is meaningful to the entire team will ensure the cardiac operating rooms are fulfilling the mission and vision of the organization, and ensure quality care for all patients.

Purpose

The purpose of this project was to increase staff involvement in the change process by discussing barriers to implementation, and allowing registered nurses, certified surgical technologists, and certified surgical assistants to successfully implement, embed and sustain change within a system.

Project Objectives

This project sought to meet the following objectives:

1. Engage all classifications of staff, including registered nurses, certified surgical technologists, and certified surgical assistants, to identify barriers related to the change process in the cardiac operating rooms.
2. Identify and implement solutions utilizing action research to allow registered nurses, certified surgical technologists, and certified surgical assistants to successfully embed change in the cardiac operating rooms.
3. Evaluate the effectiveness of each solution.

Definition of Terms

Classification (conceptual definition): A person's role within the institution, such as registered nurse, certified surgical technologist, or certified surgical assistant.

Registered nurse (conceptual definition): A circulating nurse in the cardiac operating rooms.

Certified surgical technologist (conceptual definition): An individual who scrubs and hands the instruments to the surgical team during a surgical procedure.

Certified surgical assistant (conceptual definition): An individual who scrubs and assists the surgeon as needed during a surgical procedure.

Project Overview

The goal of this project was to increase staff involvement in the change process by discussing barriers to implementation, and allowing registered nurses, certified surgical technologists, and certified surgical assistants to successfully implement, embed and sustain change within a system.

This project sought to answer the following clinical question:

1. Among cardiac operating room staff, how does increasing staff involvement in the change process improve staff satisfaction compared to the current process?

The initial step was to engage the key stakeholders in this systems change project. Key stakeholders included the nurse administrator for surgical services, the nurse manager for cardiac surgery, and the cardiac operating room staff. The administrator and the manager were very supportive of this project. The most important stakeholders in this project were the staff in the operating rooms. Discussions occurred with the staff to introduce the idea of this project and gain their support. Once this was achieved, focus groups were initiated.

Focus groups were used to gather the key stakeholders together from all classifications. Each classification had its own focus group to build trust and rapport with the members, and empower them to be involved in the process as much as possible. A safe environment where they could voice their opinions was created. After the focus groups were completed, the common themes related to change implementation were identified. These were brought back to the entire cardiac surgery group. Additional information was gathered. Barriers were identified, and solutions were proposed. The process was changed as needed throughout. The cardiac nurse manager was not present at the focus groups, as his presence could have hindered staff from discussing openly for fear of consequences. However, he was present at the large group discussion to facilitate future change.

Social Justice

Social justice implies that people have a duty to be active and productive participants in society and that society will enable them to participate. Social justice is centered on others. Marginalized groups need to be able to participate fully, which means that a culture change may

be necessary to prevent them from being excluded. Nursing must use the principles of social justice to ground, direct, and change practice. Social justice needs to be applied at two levels in practice: to assure the care provided to patients or populations is just; and to remove the barriers that keep people vulnerable (Donley, 2010).

Social justice principles guided this project in that all staff, including registered nurses, certified surgical technologists, and certified surgical assistants, had a voice in the change process. The voices of the staff are not prominent in the current process. Therefore, the project provided an avenue to voice their concerns. It is essential to respect and value the unique contributions of individuals and groups, and collaborate to meet the shared goal of providing the best patient care possible (ANA, 2001). Providing an environment where all members feel free to provide feedback is crucial in the already tense environment of the operating room.

Kalb (2009) discusses social justice based on the principles of Catholic social teaching and the relationship to the Code of Ethics for Nurses. Common good involves respect for the person, social well-being of the group, and peace and security. This project promoted the opportunity for staff to strive for the common good of the group by allowing them to provide solutions that will provide a better practice environment for the entire group.

Equality involves respecting the rights, dignity, and worth of all people (Kalb, 2009). Miller (2004) discusses how dignity includes the fundamental right to participate in decisions that affect one's life. This systems change project could have helped reduce the perceived inequalities among group members. Giving staff an equal opportunity to participate in focus groups and discuss solutions as a large group may have helped all classifications to see they are equal members of the cardiac team.

All people have the right to a productive and fair work environment (Kalb, 2009). By allowing staff to have a voice in the change process and provide solutions, they may have felt an increased worth in their role by contributing to bettering the cardiac operating rooms.

Subsidiarity implies that people impacted by decisions must be included in the conversations leading up to the decision (Kalb, 2009). The multitudes of changes that occur in the cardiac operating room directly impact the staff. This project allowed them to be involved in identifying a solution and implementing it into practice.

If the structure of the system is changed so that all members feel they have a voice to mutually agree upon solutions, the end result may be an increase in morale, and an overall increase in satisfaction in the cardiac operating rooms. If the staff understand and experience what the outcomes can be if they work together with a shared vision, they will see they can make a difference (Miller, 2004).

The ultimate goal of the cardiac operating rooms is to provide the best care to all patients. If the group continues to have turmoil, or cannot successfully implement the multitude of changes occurring, patient care may suffer.

The principles of social justice will need to be continually reinforced throughout this project, and in the future. In this changing healthcare environment where cost is a huge factor, the guiding principles of social justice can easily lose to money. It will be important to not lose the gains that may be obtained by carrying out this project through the social justice lens.

Chapter 2

Theoretical Sources Guiding Project

Theory provides a framework to guide the design and implementation of practice projects. The intent of this project was to involve all classifications of staff in the change process, and help the entire group successfully implement, embed, and sustain change. The group focus of Roy's Adaptation Model was used for this systems change project.

In her model Roy presented "the person and the environment as being in constant interaction with each other" (Butts & Rich, 2011, p.418). Roy proposed that systems as a whole, unified by a purpose, have an effect on relationships. Roy defined what she considers the major elements of her theory to be: adaptation, person, environment, health, and the goal of nursing. The model's central focus is adaptation. This theory has two foci – individuals and groups (Butts & Rich, 2011). The group focus was used to guide this project. When using the Roy Adaptation Model, interventions should be planned to address the good of the group, individuals within the group, and the good of society (Roy, 2011).

For groups, there are four adaptive modes: physical, group identity, role function, and interdependence. The primary goal for groups in each of the adaptive modes is to promote integrated processes. Ways to achieve integration are to support individual contributions, group coherence, and group transformations. A second goal is to support compensatory processes in each of the modes. Finally, the goal is to identify compromised adaptation when integrated and compensatory processes are not effective by watching for early signs of compromised adaptation (Roy, 2011).

Physical mode provides whatever is needed for the group system to survive and allows the group to be able to adapt to change. The main components of this mode are participants,

actual facilities, and resources. It focuses on setting mutual goals and allocating resources. The physical mode helped guide this project in that staffs were given the opportunity to develop solutions, and the resources (including time and education) were provided to the staff to implement them. Compensatory processes in the physical mode involve maintaining stability and adapting as changes occur. If there are compromised processes, or adaptation problems, the group must look at how it functions in crisis (Roy, 2009).

Group identity mode is about how people in groups perceive themselves based on feedback from the environment. In other words, what is the culture of the group? There is a shared identity amongst members (Roy, 2009). The individual moves between individual and group identity depending on the demands of the situation. The culture of the group involves the established expectations, including values, goals, and norms for relating within the group (Roy, 2011).

Group identity mode was a very important aspect of this project. It was important to work within the culture of the entire cardiac team, as well as the culture of each classification. Depending on the context, individuals act differently when dealing with change. When the usual coping processes are not working, or there is lack of shared identity and cohesion, there is a direct impact on the morale of the group. Those in leadership positions, along with the distribution of accountability and responsibility, also have a direct impact on morale. Compensatory processes in the group identity mode include maintaining cohesion of the group and transcending crisis that may occur (Roy, 2009).

Role function mode involves clarifying role expectations, either formally or informally. As adaptive systems, members of the group want to know who they are in relation to the other members so they can act accordingly. Individuals will have formal and informal roles in the

group. For this project, the project lead identified the informal leaders in order to promote the importance of the project. Role models, preceptors, and mentors are utilized to socialize members to role expectations. Compensatory adaptive processes for the role function mode include role playing and role negotiation (Roy, 2009).

Interdependence mode is the behavior related to the mutually supporting relationships of people. It consists of context, infrastructure, and capability of group members. Context is the external (environment, social, and cultural influences) and internal (mission, vision, values, and goals of the group) stimuli. Infrastructure is the processes (formal and informal procedures, activities, and systems) that exist in the group that relate to adaptation. Capability is the coping abilities, including knowledge, skills and attitude of group members. The infrastructure of the group allowed for open discussion of the focus group results, mutually developed solutions, and resources for implementing the solutions into practice.

The stabilizers in interdependence mode are the structures and processes for maintaining the system. The innovator subsystem includes the structures and processes for change and growth. Aggression, or lateral violence, within groups is on the rise (Roy, 2009). Aggression can be as simple as gossiping or teasing, and needs to be monitored in groups. The current culture in the cardiac operating rooms allows for these behaviors to occur – more in some rooms than others. It is important to consider where the group is at in the bigger picture. The integrity of other modes serves as a stimulus for interdependence (Roy, 2009).

Change Process

There are multiple avenues that transformation can take. There can be alterations due to new technology, such as equipment or supplies. There can be change due to new processes or procedures related to new evidence or best practices. Feedback from a group that the current

process is not working may lead to process modifications. Change can also occur to improve the quality of a process or product.

Quality can be monitored from two perspectives: quality assurance and quality improvement. Quality assurance focuses on ensuring a process is followed accurately to achieve the intended results. Quality improvement focuses on actually transforming the current process to improve the final result or outcome. This project focused on the process of change itself, and how to make it better. Therefore, this project was a quality improvement project.

Quality Improvement and Change Theory

The institution in which this systems change project was conducted utilizes a specific quality improvement framework and change theory. The quality improvement framework utilized was DMAIC (McJoynt et al., 2009). DMAIC involves five phases, which stand for: Define, Measure, Analyze, Improve, and Control. DMAIC is the overarching framework, and incorporates tools from a variety of quality improvement methods (Six Sigma, Lean, and plan, do, study, act) as needed (McJoynt et al., 2009). The define phase involves forming a team to develop a charter to outline what the project will include/will not include. The measure phase involves measuring the baseline practices. In the analyze phase, both qualitative and quantitative data are reviewed. The improvement phase includes conducting pilot projects and evaluating them, utilizing the appropriate tools to develop a plan to move forward with the change. The final phase, control, involves establishing an ongoing process control plan to maintain the improvements.

The organization also uses the ADKAR (awareness, desire, knowledge, ability, reinforcement) model for change (Hiatt, 2006). Awareness is the persons understanding of the change, and addresses what is in it for them. Desire is the willingness to support the change.

Knowledge is the information, training, and/or any education needed to implement the change.

Ability is taking the knowledge and putting it into action. Reinforcement is the internal and external factors that help sustain the change.

Literature Review

Introduction

Change is constant. There are many reasons why it may be initiated. Depending on what the transformation is, those affected may view it as positive or negative. With change come many challenges. If not implemented correctly, barriers may be encountered, reducing the chances of success. Research, change models, and quality improvement frameworks can be used as guides to increase the chances of success.

Database Search

CINAHL, MEDLINE, and Academic Search Database were used. The literature was searched using the following terms: organizational innovation, organizational change, change management, operating rooms, and surgery department. The search was limited to the past 5 years, English language, and humans. CINAHL, Medline, Academic Search Database, and the Cochrane Database for Systematic Reviews were searched for systematic reviews related to the change process.

Original Research

Openness, readiness, and resistance to change. There are many factors that influence change. Devos, Buelens, and Bouckenooghe (2007) examined how trust in management/supervisors, participation in change, and the threatening nature of change affect openness to change. Openness to change was found to be significantly affected by all three variables. Education level also influenced openness to change. Openness to change decreased

dramatically only when there was a history of change with a low level of trust in management (Devos et al., 2007).

Readiness for change is also an important factor. Organizational commitment, perceived personal competence, performance expectancy and effort expectancy were examined as to their effects on readiness for change. All four factors were found to affect readiness for change. Readiness for change can be enhanced by boosting the attachment to the organization and perceived personal competence. It is important to recognize that readiness for change is a way to reduce resistance to change (Kwahk & Kim, 2008).

Resistance to change can be affected by multiple variables. Van dam, Oreg, and Schyns (2008) examined how characteristics of daily work relate to resistance to change. The variables of information, participation, trust in management, openness to job changes, self-efficacy, leader-member exchange, perceived development climate, and organizational tenure were analyzed as they relate to change. Self-efficacy was the only variable not related to resistance to change (Van dam et al., 2008). Resistance to change occurs because of the threat to the status quo. The most common reaction to change is to be defensive. Having a clear understanding of what drives the group can help reduce resistance (Bruckman, 2008).

Change as a process. The process of change itself can be guided through multiple frameworks. Some of the more common frameworks include: plan, do, study, act (PDSA) cycles, Kotter's eight step model for change, and Lewin's change management model. Brown (2006) used plan, do, study, act (PDSA) cycles and process mapping to prevent the cancellation of patients' surgery. PDSA cycles are used to try small changes, note the effect, and try another cycle with a different change if necessary. A multidisciplinary team of key stakeholders mapped out the typical process a patient goes through for surgery. This map was then presented to staff

from multiple areas to review. The project was evaluated based on Leigh's ten commandments of project management, which include: clarity of purpose, care for customers, accountability, explicitness, planning, control, membership, reporting, meeting deadlines, and motivation (Brown, 2006).

Periyakoil (2009) discussed Kotter's eight step model for change, and how it can be used to improve palliative care programs. Kotter's model is one of the most widely used for change implementation. The eight steps are to (a) establish a sense of urgency, (b) create a coalition for change, (c) develop a vision, (d) communicate the change to others, (e) identify and overcome resistance to change, (f) generate short term successes, (g) consolidate gains and produce more change, and (h) anchor the changes in the organizational culture. Periyakoil (2009) notes that in order for the vision to be effective, it must be publicized over time. To overcome resistance to change, education, negotiation, and persuasion are effective tools (Periyakoil, 2009).

Another widely used model for change is Lewin's change management model. Suc, Prokosch, and Ganslandt (2009) used Lewin's model to implement changing requirements in the documentation of material in a surgical area. Lewin's model consists of the following: field theory, group dynamics, action research, and three steps of actual change (unfreeze, move, refreeze).

In Lewin's model, field theory involves looking at what forces influence group structure and people's behavior. Group dynamics is the understanding that the focus should be at the group level, as the group puts pressure on individual behaviors. Action research is that people need to feel the need to change, and that the most appropriate solution should be implemented, but there will be continuous evaluation of all solutions. A change can be divided into three steps: Unfreeze (getting people to understand the need for change), move (strengthening the

environment so the change can occur), and refreeze (maintaining the new change) (Suc et al., 2009).

Suc et al. (2009) found that understanding hospital-specific hierarchies and groups helped in getting commitment at all levels. It is also important to identify change opponents, as well as promoters, to make the project successful. Although each of the models for change discussed above has a different process, they can all be used to guide successful implementation and sustain change.

Change within organizations. Heslin et al. (2008) analyzed problems affecting operating room redesign. In order to understand how the changes were affecting staff, town-hall type meetings were held. A multidisciplinary group of key stakeholders was formed to propose changes based on the gathered data. Support from key leaders gave credibility to the change efforts (Heslin et al., 2008).

Implementing universal operating room start times can be a challenge. Donahue (2008) presented how an academic medical center was able to successfully implement universal start times. A group of key stakeholders was formed to plan the process. To establish buy-in from those affected, a meeting was held to discuss the process. Monthly meetings would also be held to review data from the change. Debriefing sessions were held daily to review the process. The group found that successful change implementation involves the following factors: developing trust, having a compelling vision, creating a sense of urgency, maintaining momentum, and communication (Donahue, 2008).

Hayman, Wilkes, and Cioffi (2008) reviewed the effects of a redesign of a nursing practice model. After three months of implementing the new model, nurses reported dissatisfaction, and believed the model was ineffective. After further investigation, it was found

that nurses were not working within the new framework, and continued with their old ways. This was attributed to a lack of understanding of the new model. In order for change to be effective, workers must have a voice in the change, especially during top-down implementation of changes. The context in which the change will be implemented needs to be considered (Hayman et al., 2008).

Changing workplace culture. Transforming workplace culture is an intimidating task. Berrett, Piatek, Korber, and Padula (2009) looked at the effects of group sessions on lateral violence, teambuilding, and nurse satisfaction on nursing units where morale and satisfaction were low. Group sessions had a positive effect on group cohesion. It is important for the manager to be an integral part of the process, and to articulate clear goals and expectations from the group. The manager needs to be viewed by staff as being effective in their role, and is able to drive and sustain change (Barrett et al., 2009).

Costello, Clarker, Gravely, D'Agostino-Rose, and Puopolo (2011) looked at how to build a respectful workplace in the operating room. Interventions to move to a respectful workplace included using a code of conduct that all staff would follow, holding team members accountable for managing conflict, following clear guidelines for conflict resolution, and providing education on conflict resolution and diffusing hostility. Involving staff and leaders at all levels is essential for success. Managers and leaders need to be committed to change, and continuously monitor outcomes (Costello et al., 2011).

Systematic Reviews

Three systematic reviews were appraised related to this systems change project. Lansisalmi, Kivimaki, Aalto, and Ruoranen (2006) looked at innovation in healthcare. Leeman,

Baernholdt, and Sandelowski (2007) developed taxonomy for implementing change. Parmelli et al. (2011) reviewed strategies to change the culture of the organization.

Many factors affect the adoption of change. External factors include motivation, support, and involvement. High levels of support lead to increased team effectiveness. Internal factors include strong leadership, and shared objectives (Lansisalmi et al., 2006). Workers attitudes influence the adoption of change (Leeman et al., 2007).

There needs to be an increased coordination among groups to oversee the change (Leeman et al., 2007). Peer opinion leaders are important (Lansisalmi et al., 2006). An individual should be designated to lead the change and identify barriers. Barriers to change may include lack of support and insufficient time. When implementing change, reminders should be provided. (Leeman et al., 2007).

Parmelli et al. (2011) were unable to draw any conclusions, as no studies met the criteria for the review. Studies that were reviewed tended to focus on changing the culture related to safety, not quality and performance. It is recommended that research be done to strengthen the evidence related to improving healthcare performance when changing organizational culture (Parmelli et al., 2011).

Expert Opinions

The staff in the cardiac operating rooms are the experts in regards to how change, and the change process, affects them. They work in this environment, and are responsible for managing the changes. Staff has voiced concern that there are too many changes. A recent survey conducted by the cardiac surgery staff related to safety identified that staff do not always follow policies and procedures, mostly related to lack of education and understanding. Some staffs

perceive that managers/supervisors do not enforce policies and procedures consistently. These factors may contribute to decreased satisfaction in the group.

Integrative Review

It is essential for staff to have a voice in the process so they will buy-in to the change. Multidisciplinary teams are crucial to the success of change implementation. Staff should be involved in developing shared objectives related to the change. Assessing current demands of staff could also predict whether or not the change will be adopted into daily practice. When changes are implementing, sufficient time and understanding are needed by those involved in the change. Designating a peer leader for the change can help with implementation of the change, and also help to identify barriers that may develop.

Strong leadership is crucial to effective change. Leadership must be trusted and viewed as supportive. They must be involved in all steps of the process, and monitor for ongoing success. The culture of the group needs to be considered. How staff reacts and adapt to change is related to satisfaction. Group sessions may improve group cohesion, and improve satisfaction. Having a clear understanding of what drives the group can help reduce resistance.

The institution where this systems change project was conducted utilizes a quality improvement framework that is based on six sigma and lean methodologies, and has a very clear process of how to initiate and sustain improvements in practice. There are a variety of change models available to guide change implementation. This project utilized ADKAR as the framework.

Ranking and Type/Level of Evidence

The articles reviewed were ranked by the type and level of evidence according to Ackley, Ladwig, Swan, and Tucker (2008) (see Appendix A). The strength of the evidence was ranked based on The Agency for Health Care Research and Quality (AHRQ) (see Appendix B).

One of the articles reviewed was a RCT, and therefore was level I evidence (Devos et al., 2007). Three of the articles reviewed were quasi-experimental, and therefore level III evidence (Barrett et al., 2009; Tvedt et al., 2009; Van dam et al., 2008). The studies by Baumgart et al. (2009), Brown (2006), Costello (2011), Donahue (2008), Hayman et al. (2008), Heslin et al. (2008), Kwahk, & Kim (2008), and Suc et al. (2009) were all level VI evidence. Periyakoil (2009) was level VII. Two of the systematic reviews were level II evidence. The third systematic review was unable to draw any conclusions, so was not ranked.

The original study by Devos et al. (2007) was rated as poor for strength of evidence. The systematic review articles in Appendix C were rated as good for the strength of evidence. Of the remaining studies reviewed, ten would be rated as good (Barrett et al., 2009; Baumgart et al., 2009; Brown (2006), Costello et al. (2011), Donahue (2008), Hayman et al., 2008; Heslin et al. (2008), Periyakoil (2009), Suc et al. (2009), and Tvedt et al., 2009). Two of the studies would be rated as poor for strength of evidence (Kwahk et al., 2008; Van dam et al., 2008) as there was no discussion of how it was related to health outcomes.

Only one of the articles reviewed was level I evidence. Three of the articles are level III evidence, and ten are level VI. The qualitative and descriptive studies have a lower level of evidence, but may provide insight into the thoughts and perceptions of those undergoing change, which is very pertinent to this systems change project. The results of all of the studies will need

to be considered along with the level and strength of evidence when transferring to other settings (see Appendix C).

Summary of Recommendations

Change is constant in the cardiac operating rooms. Successful implementation of change is essential to providing the best possible care for the patients in cardiac surgery. The literature provides recommendations for successfully implementing change. Utilizing these recommendations can help staff to embed and sustain changes to policies, procedures, and practice in their daily work.

Strong, supportive, effective leadership is critical to successful change (Barrett et al., 2009; Heslin et al., 2008; Lansisalmi et al., 2006; Leeman et al., 2007). The cardiac leadership team is a cohesive group that is very supportive of staff. Ensuring this continues will lend to positive results when changes are introduced and implemented.

Devos et al. (2007), Donahue (2008) and Van dam et al. (2008) identified the importance of trust in leadership related to change. On a previous survey completed in the cardiac surgery department, staff reported that leadership does not always enforce policies and procedures consistently. This issue will have to be addressed with the manager/supervisor for the cardiac staff to ensure trust in leadership is maintained or increased.

Giving staff a voice in the change process can help with buy-in when implementing change(s) (Donahue, 2008; Hayman et al., 2008; Leeman et al., 2007; Van dam et al., 2008). Incorporating staff in the change process may increase adoption of the change(s) into their daily work.

The education level of staff influences their openness to change (Devos et al., 2007). The cardiac surgery staff identified that they need more education on policies and procedures. There

are also a variety of education levels of staff in cardiac surgery. Providing additional education on policies and procedures, while considering what each classification needs to know, may increase staffs openness to change.

Morale was low amongst some staff in the cardiac operating rooms. Improving group cohesion may improve satisfaction, which may have a positive effect on morale. Group sessions were identified by Barrett et al. (2009) as having a positive effect on group cohesion. Lansisalmi et al. (2006) and Leeman et al. (2007) identified the importance of a peer leader when implementing change. The leader can also help identify barriers to the change.

Lansisalmi et al. (2006) and Parmelli et al. (2011) identified the need for further research related to organizational change and the effect of changing culture related to improving healthcare performance. This systems change project could provide further insight into this area of research.

Chapter 3

Methodology

The purpose of this project was to increase staff involvement in the change process by discussing barriers to implementation, and allowing registered nurses, certified surgical technologists, and certified surgical assistants to successfully implement, embed and sustain change within a system.

Setting

This project took place at a large Midwest teaching institution. The focus was on the eight cardiac operating rooms in the surgical services division. Nine cardiac surgeons operate in the eight operating rooms. The cardiac patient population spans the entire age spectrum. Patients served vary from rural areas to international. The organization is constantly striving to be the best, and provide the highest quality care possible. In order to do this, there are constant changes throughout the organization and within the cardiac operating rooms.

Sample

The population for this project included all registered nurses, certified surgical technologists, and certified surgical assistants that work in the cardiac operating rooms. There were 20 registered nurses, 22 certified surgical technologists, and 10 certified surgical assistants. The sample size varied from 20 to 28, depending on the phase of the project. There were 37 females and 15 males. Education level of the group varied from on the job trained to masters prepared, with the majority of staff having a two year degree. Years of experience in their role range from less than one year to greater than 30 years.

Ethical Considerations

The ethical considerations for this systems change project involved ensuring all classifications had a voice in the change process. A potential conflict of interest was that since

the project lead is a registered nurse, members of the certified surgical technologists and certified surgical assistants groups could have viewed her as a biased leader. Authority issues could have arisen, as one of the classifications has a supervisor along with the nurse manager, and directions from the supervisor and manager are not always consistent. This was addressed at the beginning of the project by having an open discussion between the project lead, the manager, and the supervisor as to the goals of this project. IRB approval was obtained from St. Catherine University for both phases. The institution in which the project was conducted deemed it quality improvement, so no IRB approval was needed.

Design

The systems change project utilized action research and a quality improvement framework using mixed methods. This project involved two phases. The first phase was a qualitative design used to gain an understanding of the perceptions of registered nurses, certified surgical technologists, and certified surgical assistants in the cardiac operating rooms about the current process for communicating and implementing changes in policies, procedures, and practice. Phase II involved implementing the solutions identified by the cardiac staff and evaluating the outcomes.

Phase I

Phase I used focus groups to gain an understanding from the cardiac surgery staff, including registered nurses, certified surgical technologists, and certified surgical assistants, about the current process for communicating and implementing changes in policies, procedures, and practice in the cardiac operating rooms.

Two focus groups were offered for each classification. The staff chose the one that best fit their schedule to attend. To participate in the focus groups, staff came in thirty minutes prior

to their scheduled shift to be a part of the group. Implied consent was obtained by coming to the focus groups. An email invitation was sent to all registered nurses, certified surgical technologists, and certified surgical assistants in the cardiac operating rooms explaining the purpose of the focus groups (see Appendix D). The focus groups were thirty minutes in length. This added overtime for the staff in the department. Approval for this additional cost was obtained by the nurse manager and nurse administrator. Managers and supervisors were not present at the focus groups. The project lead facilitated the focus groups based on Krueger's (2000) guide (see Appendix E). The focus groups were audiotaped.

Data analysis and identified solutions. The data from the focus groups was transcribed and analyzed by the project lead. Based on Krueger (2000), data was analyzed using tape-based abridged transcripts. Using utilization-focused evaluation (Patton, 2011), a focused evaluation was used to look for patterns and themes. The common barriers related to change implementation were identified. These were brought back to the entire cardiac surgery team at a staff development session. The staff development session was used to gather information from those unable to attend the focus groups. The cardiac surgery staff agreed with the identified barriers to change implementation in the cardiac operating rooms and proposed three solutions:

1. Provide staff information on changes before they will be implemented.
2. Utilize electronic resources for surgeon preferences.
3. Implement a communication board in the cardiac office.

Phase II

Phase II of the systems change project was to improve satisfaction with the change process by implementing the process change solutions identified by the staff in the cardiac operating rooms.

First solution. The first proposed solution was to provide staff information on changes before they were implemented. The changes were communicated in two ways. First, the project lead and the manager of cardiac surgery used staff development time to introduce and discuss upcoming changes to policies, procedures, and practice. The amount of time needed at staff development sessions was dependent on the number of upcoming changes, and questions staff had regarding the changes. This time was also utilized to summarize and educate staff on previous changes to policies, procedures, and practice. Secondly, the manager, with the assistance of the project lead, used a weekly update, sent via email on Friday to all cardiac surgery staff, to summarize all changes announced that week, and to introduce upcoming changes.

Second solution. The second proposed solution was to utilize electronic resources for surgeon preferences. It is imperative to keep the surgeon preferences updated, as they are the guide to what a surgeon typically uses for a procedure. Previously, the preference books were in paper format for each of the eight cardiac operating rooms and the cardiac office. It is the responsibility of the registered nurses and certified surgical technologists that are primarily assigned to a surgeon to keep all preferences updated in all of the books. Staff identified this as a huge barrier, and the books were not updated in each operating room. The staff wanted to transfer the surgeon preferences into an electronic program already available. Once all of the preferences were entered, they were kept up to date electronically. When changes were made, two copies were printed and put into master books in the cardiac office and the emergency operating room, eliminating the redundant process of making copies and going to each of the operating rooms to update. The master books also serve as a back-up in case of computer problems.

Third solution. The final proposed solution was to implement a communication board in the cardiac office. One of the current bulletin boards in the office was utilized. The staff wanted a central location to write down tasks needed to be completed, such as committee work, new employee orientation needs, competencies and required training. The project lead also posted staff development information and competency/required education lists on the board. Staff wrote the task needed to be completed and the amount of time needed. This allowed the charge nurse, manager, and peers to know the needs of the cardiac surgery department, and to plan accordingly. The board was built by cardiac surgery staff.

A pre/post electronic survey was used to assess the level of satisfaction of registered nurses, certified surgical technologists, and certified surgical assistants related to the change process before and after the proposed process changes were implemented. An email invitation was sent to all registered nurses, certified surgical technologists, and certified surgical assistants in the cardiac operating rooms explaining the purpose of the survey, and discussed that completing the survey would imply consent (see Appendix F). See Appendix G for timeline of project.

Resources

This was a quality improvement project carried out as part of the normal activities of the cardiac operating rooms. Even though it was quality improvement, in order for the project to be successful, the costs and resources needed to be considered. Most of the time dedicated to the completion of the project was in kind donation by the project lead. Other staff involved in the project included: registered nurses, certified surgical technologists, certified surgical assistants, electronic environment staff, an administrative assistant, site mentor, cardiac nurse manager, certified surgical assistant supervisor, and nurse administrator.

The time utilized to complete the project had significant opportunity costs for all involved. The focus groups were held prior to work hours, so staff gave up their personal time to attend. Staff development sessions were used to present data and discuss the project. This time could have been used for other educational opportunities. Time used to enter surgeon preferences electronically could have been used for other tasks, or to go home early, which would have saved the department money, as the staff were all paid their normal hourly wage to enter the preferences. The electronic environment staff, administrative assistant, site mentor, cardiac nurse manager, certified surgical assistant supervisor, and nurse administrator all had to give up time that could be spent on other projects and tasks to be part of the project.

When calculating costs for staff resources other than the project lead, the starting salary of a registered nurse was used as the hourly rate. This is a figure available to the public on the institution's job posting website. The project lead does not have access to the salaries of other classifications. The total monetary cost to complete the project was \$3,190.00. See Appendix H for resources/budget table.

If an employee leaves, the average cost of orienting a new registered nurse for forty hours a week for six months would cost about \$28,000, based on salary only. The return on investment (ROI) was calculated using the following formula: $(\text{total benefits} - \text{total cost}) / \text{total costs} \times 100$. Therefore, $28,000 - 3,190 / 3,190 \times 100$, yielded an estimated 775% ROI at the start of the project.

In order to complete the pre/post electronic survey, the current software program utilized by the institution was used. An administrative assistant helped in the formatting of the survey and compiled the results. Approval was received from the nurse administrator, as it added to the administrative assistant's workload.

Key Stakeholders

Key stakeholders included the nurse administrator for surgical services, the nurse manager for cardiac, and the cardiac operating room staff. The administrator and the manager were very supportive of this project. The most important stakeholders in this project were the staff in the operating rooms. Discussions occurred with the staff to introduce the idea of this project and gain their support.

Support from Site

The nurse administrator for surgical services and the nurse manager for cardiac surgery were supportive of this systems change project to analyze the change process in the cardiac operating rooms. The nurse administrator verbalized that the process used for this project could potentially help guide leaders in other areas of surgery. The nurse manager was supportive of giving staff a voice in the change process, and understanding what barriers they may face. Support was sustained by having regular meetings with the nurse administrator and nurse manager to update them on the status of the project, and any key findings that emerged.

Evaluation Plan

The evaluation plan for this systems change project was a combination of traditional evaluation methods (formative and summative) and developmental evaluation. Bringing the common barriers back to the cardiac surgery team was formative evaluation, since it involved changing and improving the process. As the new process changes were implemented, the process of doing so may be changed. Changes in the environment, differing needs of staff, and any other unanticipated factors may have an effect on the process. This portion was developmental evaluation – changing to fit the needs of the entire group. The formal evaluation was summative,

as it evaluated if the new process changes met the needs of all members of the group. This evaluated if the process is actually working (Patton, 2011).

Instrument

The success of the process changes implemented were measured using a pre/post electronic survey sent via e-mail to all registered nurses, certified surgical technologists, and certified surgical assistants that work in the cardiac operating rooms. The pre-survey was completed prior to implementing the solutions. Three months later, the post-survey was completed. The pre/post surveys were available for two weeks for staff to complete.

The evaluation tool was designed by the project lead based on the barriers and proposed solutions identified by the cardiac surgery staff. It was a pre/post electronic survey. The evaluation tool has face validity, as it is based on feedback and opinions of experts working in the cardiac operating rooms. The tool was designed to collect quantitative and qualitative data. Likert scales and open ended comment areas were included in the tool (see Appendix I).

Summary

The purpose of this systems change project was to implement a process change in the cardiac operating rooms that incorporates the voices of all classifications of staff, including registered nurses, certified surgical technologists, and certified surgical assistants, and allow them to successfully implement, embed and sustain a change in practice. Focus groups were conducted and content analysis was utilized to identify common themes related to change implementation. Process changes identified by the cardiac surgery staff were implemented. The quality improvement framework and change model utilized by the institution were used. A pre/post survey was used to evaluate the success of the process changes. The process changes were adapted as needed by the group through the lens of action research.

Chapter 4

Results/Data Analysis

The purpose of this project was to increase staff involvement in the change process by discussing barriers to implementation, and allowing registered nurses, certified surgical technologists, and certified surgical assistants to successfully implement, embed and sustain change within a system.

This project was completed in two phases. Phase I used focus groups to gain an understanding about the change process for the cardiac operating rooms. Phase II of the project was to improve satisfaction with the change process by implementing the solutions identified by the staff in the cardiac operating rooms.

Phase I Results

Using a qualitative methodology, focus groups were conducted to gain an understanding of the current process for implementing new and/or revised policies, procedures, and practices in the cardiac operating rooms. Six registered nurses, four certified surgical technologists, and ten certified surgical assistants attended the focus groups. The focus groups were audiotaped and transcribed. The focus groups were audiotaped and transcribed using Krueger's (2000) tape based-abridged transcript method. Using utilization-focused evaluation (Patton, 2011), the data was examined by the project lead, searching for common themes and patterns.

Objective 1

Engage all classifications of staff, including registered nurses, certified surgical technologists, and certified surgical assistants, to identify barriers related to the change process in the cardiac operating rooms.

Communication. Data analysis revealed multiple categories, which all related to one overarching theme – communication. Barriers related to change processes, staff, and leadership all were associated with communication problems. Staff also identified communication problems across classifications in the cardiac operating rooms. Further, the communication between staff and leadership was reported as not ideal. Communication barriers were the overarching theme identified throughout the focus groups. Multiple categories under this theme are outlined below.

Communication barriers related to the change process. Staff reported that there are too many changes occurring all the time. The rate and frequency of communication and change creates pressure for staff to respond in a timely manner. Lack of knowledge about the new process, procedure, and/or practice was also identified as a barrier. Similarly, staff is expected to incorporate new mandates into practice immediately. With the constant flux of the healthcare environment, with new institutional initiatives, and best practices constantly emerging, the expectation is that staff incorporates many transitions in short periods of time. Constant change has become, and will continue to be, the norm. Staff believe there is not enough lead time prior to implementation of the new process, procedure, and/or practice. In addition, conflicting information about the new process, procedure, and/or practice from the leadership team and their peers is a barrier for staff. This results in each individual interpreting the information in their own way. Participants stated “everyday (there’s) something more.” “Changes do not always make sense.” “No consistency; hard to know what’s going on.” “There is not enough time to complete other tasks, such as updating surgeon preferences, education requirements, and email.”

Communication barriers related to staff. Another barrier to change identified was the staff themselves. They perceive that the number of staff available in the cardiac operating rooms to be able to implement all of the change that occurs is insufficient. There are eight cardiac

operating rooms that must be standardized to efficiently provide care. Lack of communication amongst team members has contributed to the lack of standardization from room to room, which makes it difficult to know the correct way to complete tasks. This is worsened when staff outside of the cardiac department assists with cardiac cases; they are not familiar with cardiac specific policies and procedures. These factors may lead to rushed or no communication between staff. Participants stated “people don’t always follow policies (and procedures) ... “Can’t standardize when staff don’t enforce.” “Too many people opening supplies – don’t know what is needed; more waste.”

Resistance to change was also discussed. Staff report resistance is a barrier, especially when there is no reason for a change or they don’t understand the reason. Two classifications identified that age and tenure in the cardiac operating rooms was related to resistance. Participants stated “...fear of getting in trouble for not doing something that doesn’t make sense.” “The older and longer you’ve been here, the more resistant they are to change.”

Communication barriers related to leadership. Staff perceives communication from leadership to be fragmented. Lack of follow-through from leadership was identified as a barrier. Staff discussed that there are no consequences for not following the rules once a change in practice has been communicated and implemented. They believe that changes are not thought through before implemented, causing revisions to occur shortly after. Staff feel those making the decisions are not closely involved in the practice. They would like leadership to be present more often in the operating rooms to communicate and enforce revised policies and practices. Some practices specific to the cardiac department are not supported by policy, but instead by the manager’s preferences. This causes friction in the group. Participants stated, “There is no follow-through with those who aren’t following policies.” “Announcing general statements to all staff

when there are certain people who aren't doing it is not helpful." "Nobody enforces rules across classifications." "(The manager) should go room to room so (all team members) know the information."

Objective 2

Identify and implement solutions utilizing action research to allow registered nurses, certified surgical technologists, and certified surgical assistants to successfully embed change in the cardiac operating rooms.

Identified solutions for improving communication. Using action research, the barriers to change identified in the focus groups were presented to the cardiac team, who validated the findings. To improve communication, the cardiac surgery staff identified three solutions that were implemented as a quality improvement project in the cardiac operating rooms. These solutions were: Provide staff information on changes before they will be implemented, utilize electronic resources for surgeon preferences, and implement a communication board in the cardiac office. The solutions were identified and implemented to decrease barriers to effective communication related to the change process, staff themselves, and leadership.

Communication before change implementation. The first solution identified was to provide adequate information in a timely manner before change is implemented. When staff was asked how they would like to hear about changes, daily announcements at staff report were the most common response. Staff would like changes announced more than one day, and at all shift reports throughout the day. They would like the announcements from report to be summarized and put into a weekly email that they could review. When changes are announced, it is important for the staff to have the rationale with it so they have an understanding of the background and reasoning for the new practice.

To communicate and introduce changes, staff also identified that staff development time could be used to give updates on policies and procedures, and allow time for discussion and additional education. This time could be used on an as needed basis. To help standardize and decrease confusion, the registered nurses, certified surgical technologists, and certified surgical assistants would like all staff to receive the same messages - including residents, surgeons, and other allied health staff working in the cardiac operating rooms. Participants stated, “Need to give the why so it makes sense; changes should be evidence based.” “Email ahead of time before change occurs.” “Have a core group of people that are the resource people.”

Electronic communication resources for surgeon preferences. Resources for surgeon preferences were in paper format, in nine different books. In some operating rooms, staff had also developed surgeon specific books. Staff was not able to change and update them efficiently. There was not a centralized location where all of the information was located. Some staff had the information in word documents on a computer drive; some staff still had old preferences on a disk; others had no electronic copy, and had to type an entire new copy to update the books. There was also not a standardized format; staff put the information they felt was important for a particular surgeon. Participants stated, “Not enough time to update procedure books.” “Don’t send staff home early so they can update case cart reqs...” “Case cart reqs and procedures need to be updated”

Communication board in the cardiac office. The needs of the staff in the cardiac operating rooms were not always known. There are a variety of committees that cardiac staff members are on, and the requirements are varied. Staff are involved in projects and work initiatives that were unknown to the rest of the group. It was sometimes hard to get staff to their required meetings, or allow them work time to complete non-patient care tasks. The staff would

let the charge nurse know if they needed work time, and the charge nurse would try to accommodate. Since all members of the team did now know the needs and level of involvement of their peers, they would sometimes question why they were being provided work time.

Staff identified that a visual tool may help the charge nurse get people out that have projects and tasks to complete. The tool would also allow staff the ability to see who is involved with the different committees, and what the work load and requirements are for staff on them. It also allows all staff to stay updated on what is occurring in the department, division, and institution. Participants stated, “Have a board set-up to sign-up needs related to orientation, competencies and education.” “Plan and set aside time to learn; have things outlined in advance...don’t send staff home early so they can ... complete education.”

Identified Solutions

Based on staff feedback, three solutions were implemented to remove barriers and improve overall communication between staff. They were:

1. Provide staff information on changes through daily reports and weekly emails before changes are initiated.
2. Transfer paper based surgeon procedure preferences into electronic format.
3. Implement a communication board in the cardiac office so staff needs are more visible.

Phase II Results

Objective 3

The third objective evaluated the effectiveness of the solutions. The pre/post survey was developed utilizing the overarching theme of communication and the barriers identified during the focus groups and staff development sessions. The three solutions identified by the cardiac surgery staff were also incorporated.

Quantitative data was gathered using a pre/post likert scale electronic survey. The pre/post surveys were available for two weeks for staff to complete. On the pre-survey, 25 staff responded, for a rate of 48%. The post-survey had 28 staff respond, for a rate of 54%. The survey results were viewed as aggregate data, and were not separated by classification. The data was analyzed using SPSS® statistical software. Descriptive statistics, including frequency and percentages, were used. Chi-square analyses were performed on survey questions 1, 3, 4, and 5. Chi-square analysis was not done on question 2, since staff could choose as many answers as they saw applicable. The purpose of question 2 was to capture progress on staff satisfaction based on focus group categories and the overarching theme of communication (see Appendix I). Reliability testing was completed across all survey questions. Cronbach's alpha was 0.9. The test-retest reliability using Spearman Rho was 0.8.

Survey question 1. The first question on the survey looked at the current level of satisfaction with the change process (see Table 1). On the pre-survey, there were several comments related to the number of changes that are made, such as “way too many changes coming down, hard to keep track of everything” and “...everyday there's something new to do or something new being discontinued.” There were also comments on the lack of input staff has

regarding changes. “Decisions are not made with input from those that will be implementing the changes.” Another staff objected to “...a couple of people change things for the larger group.”

Table 1

Level of Satisfaction

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Pre-survey	0.0% (0)	38.5% (10)	42.3% (11)	15.4% (4)	3.8% (1)
Post-survey	3.6% (1)	35.7% (10)	50.0% (14)	7.1% (2)	3.6% (1)

Chi Square $\chi^2 = 1.96; p=.744$

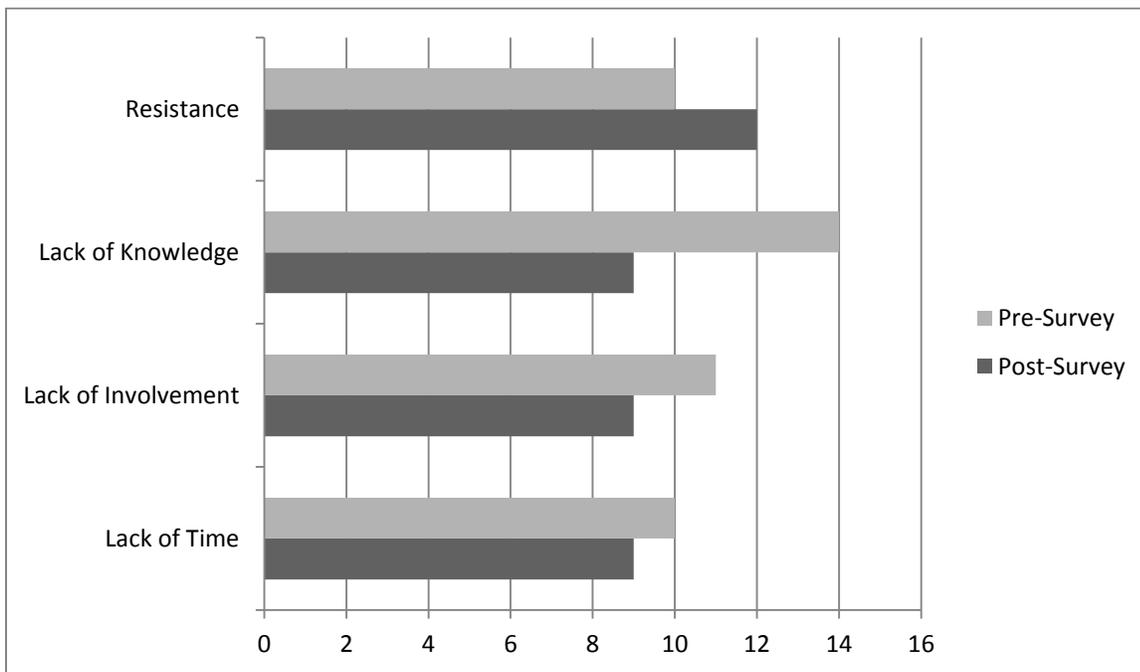
Analysis of satisfaction level data in question 1 was not statistically significant; however, the descriptive data indicates that the solutions implemented were somewhat helpful for staff. On the post-survey, comments included: “Seems like there is more communication between all groups;” “In some rooms change is easier than others;” “It would be easier to accept changes if they made sense.” This change was reflected in the post-survey data. The number of dissatisfied decreased by half on the post-survey. In addition, there was a gain of one participant in the very satisfied category. Since more participants responded to the post-survey, it may also indicate increased staff engagement in this project.

Survey question 2. The second question used descriptive choices as it allowed respondents to choose any or all answers that were applicable to them. As mentioned above, feedback for three categories (barriers related to change processes, staff, and leadership) and the overarching theme of communication was obtained. Each category had additional code that provided further information. The rationale to obtain data in this manner was to identify which codes and categories of communication were improving, and whether the perception of overall

communication was changing. The first category was barriers related to the change process (see Figure 1). When looking at the codes for barriers related to the change process, lack of knowledge decreased almost 6%, while resistance increased almost 8%. On the pre-survey, a comment related to lack of time was: “There is more to do and no time to do this.” Comments related to lack of knowledge included: “We change things without the evidence to back it up.”

Figure 1

Barriers Related to Change

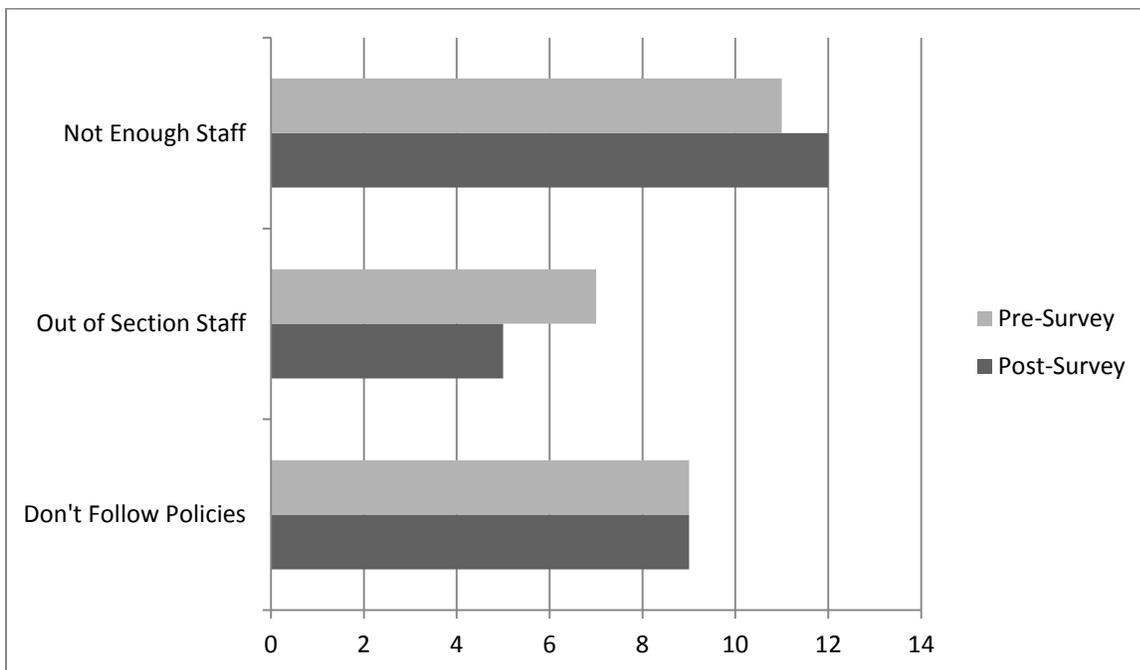


Reviewing the figure, it is clear participants felt knowledge, staff involvement in the process, and time perception improved. Interestingly, resistance to change scores increased. On the post survey, a comment made related to lack of knowledge was “not everyone gets the same information on a daily basis.” This may shed some light on the resistance to change score. If staff perceives that not everyone gets the same information, knowledge may improve but resistance to change may increase with it as well.

For question 2, the second category of barriers was related to staff (see Figure 2). Comments regarding barriers related to staff were similar on the pre and post surveys. Comments on barriers related to staff included “staff...interprets announcements in their own version” and “some staff don’t take all changes seriously.”

Figure 2

Barriers Related to Staff



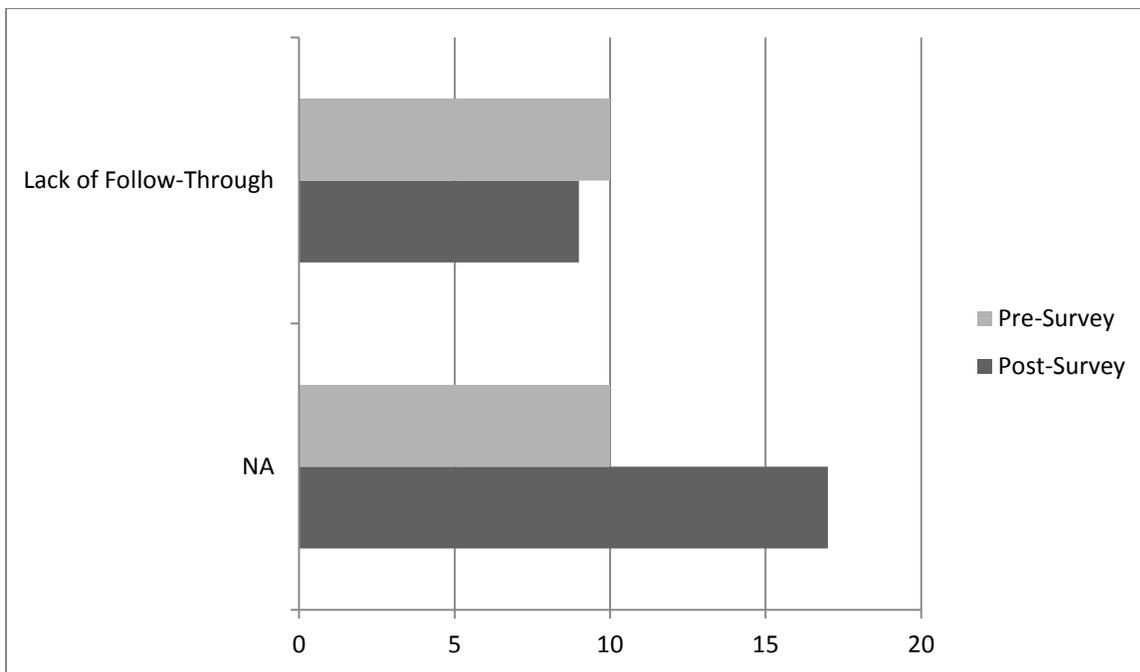
The figure indicates an interesting pattern. It appears that the standardization process for communication impacted staffs perception that communication barriers has lessened due to out of section staff in cardiac operating room. However, feeling that more staff is needed to do the work has intensified. This increase may be reflective of the perception that leadership is listening to their concerns. There does not appear to be any changes in how policies are followed.

The third category of barriers on question two was related to leadership (see Figure 3). Not applicable (NA) was a choice added for this category, as the computer program for the

electronic survey requires each question to have a response. In order to allow participants an option if they did not perceive leadership as a barrier, the NA choice was added. On the pre-survey, a comment included: “Follow-thru is there from leadership, but it’s not enough – there’s no consequences it seems.”

Figure 3

Barriers Related to Leadership



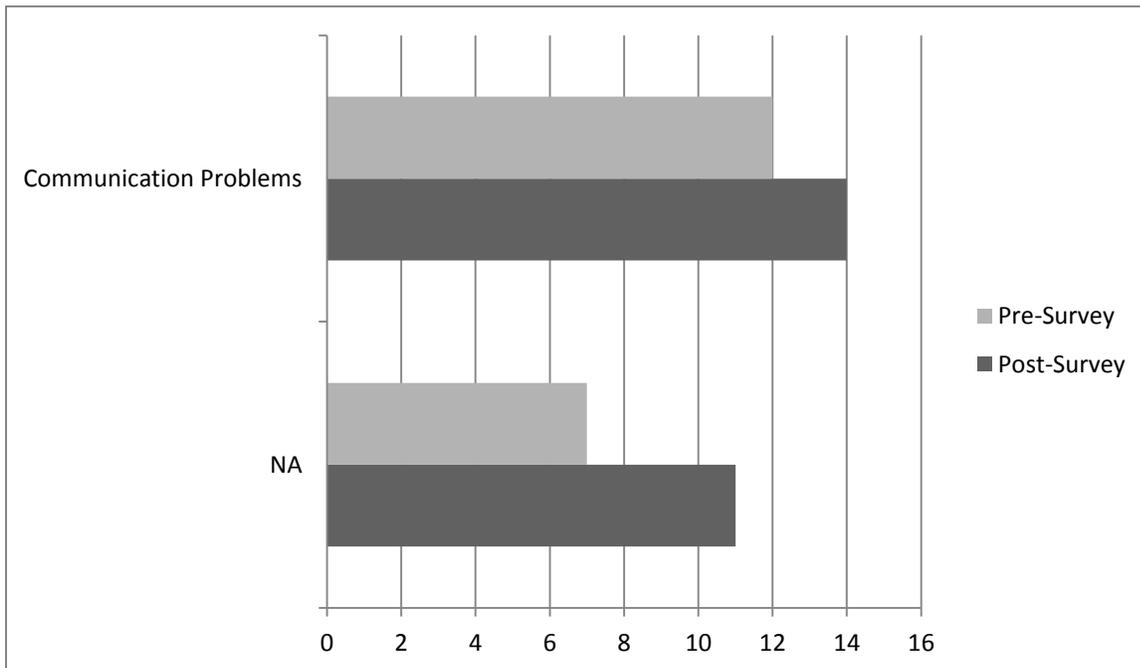
Lack of follow-through from leadership decreased fifteen percent on the post-survey. A comment on the post-survey included “when major infractions/practices in the OR are routinely being broken, there is not consequence for it. This happens over and over again.” The number of staff that chose NA increased on the post-survey. This may be an indication that less staff perceives lack of follow through from leadership as a barrier to change.

The last part of question 2 was related to the overarching theme of communication (see Figure 4). Again for this category, NA (not applicable) was an option to allow participants who

did not perceive communication as a barrier to indicate that in their responses. Comments on barriers related to communication included “be consistent with communication” and “not everyone gets the same information.”

Figure 4

Barriers Related to Communication



The figure indicates that there is an increase in the number of participants who perceive there are communication problems. This may be due to the increased number of respondents on the post-survey. It may also be indicative of staff engagement in the process; since they were so involved, they may realize the extent of the communication problem in the department. Because of these possibilities, the data may be distorted. The number of staff that chose NA also increased on the post-survey. This may be an indication that staff perceive communication to be improving.

Survey question 3. The third question of the survey looked at the effectiveness of the process for communicating changes (see Table 2). The pre-survey typical comments included: “I think we are all trying to accomplish the changes...we are trying to use our best judgment in our care...;” “The current process has caused extreme dissatisfaction for me in my role.” On the post-survey, comments included “Weekly updates to all staff have improved the communication process;” “Weekly updates are good;” “Like the communication board in the office;” “Changes are communicated by nursing committees without input from other staff;” “Not everyone is at morning report when most of the changes are announced...it would be helpful if upper management was at report for every shift...”

Table 2

Level of Communication Effectiveness

	Very Effective	Effective	Neutral	Ineffective	Very Ineffective
Pre-survey	0.0% (0)	38.5% (10)	42.3% (11)	15.4% (4)	3.8% (1)
Post-survey	3.6% (1)	42.9% (12)	28.6% (8)	21.4% (6)	3.6% (1)

Chi Square $x^2 = 1.98; p=.739$

The level of communication effectiveness was not statistically significant; however, descriptive data provides encouraging trends. The number of participants that found the level of communication effective or very effective increased. In addition, the number of respondents that chose neutral decreased by three, while the number that chose very ineffective communication remained stable at one participant. Interestingly, the number of staff that chose ineffective increased by two, which may be reflective of the increased number of participants in the post survey.

Survey question 4. The fourth question looked at the effectiveness for updating and maintaining surgeon preferences (see Table 3). On the pre-survey, several comments were made that there are so many changes it is hard to keep up with them. Other comments included: “Too many books to change;” “Books are not kept up to date;” “No time to do any of this;” “Not everyone can do it.” On the post-survey, comments included: “It would be nice if it was all consistent...the layout is different;” “A standard format would be much more effective;” “Books in the OR worked;” “Only staff that works with a specific surgeon can make changes;” “The current program needs an overhaul and with some reprogramming could be much more effective.”

Table 3

Effectiveness of the Process for Updating and Maintaining Surgeon Preferences

	Very Effective	Effective	Neutral	Ineffective	Very Ineffective
Pre-survey	0.0% (0)	11.5% (3)	30.8% (8)	53.8% (14)	3.8% (1)
Post-survey	3.3% (1)	26.7% (8)	63.3% (19)	3.3% (1)	3.3% (1)

Chi Square $x^2 = 18.83; p=.001$

The differences between the pre and post survey were statistically significant ($p < 0.05$). This is also reflected in the descriptive data. There was a large decrease (50%) in the number of staff that believes the process for updating surgeon preferences is ineffective. The number of participants who found this solution for updating surgeon preferences effective or very effective more than doubled. There was over a 30% increase in the number of staff that chose neutral. One individual found this solution to be ineffective. Since the data was analyzed as an aggregate, it is difficult to determine whether the same individual found this intervention very ineffective pre

and post survey. The uneven number of respondents in pre and post surveys, and aggregate data analysis makes it difficult to pinpoint changes at the individual level.

Survey question 5. The final question looked at awareness of staff (registered nurses, certified surgical technologists, and certified surgical assistants) needs in the cardiac operating rooms (see Table 4). Comments on the pre-survey included: “There is so much out there it is necessary to keep up on as much as possible, but not always enough time when scrubbed all day;” “Only if the charge nurse has been pressured...to get staff to complete these items.” “Staff are not responsible for their own (tasks).” On the post-survey, comments included “I like the board in the office;” “I don’t need to know the needs (of others)...I know my needs and that’s all I mind;” “There is one class that is constantly getting their needs met. This will never change;” “For a department to be whole as a team...everyone has to be on the same page.”

Table 4

Awareness of Staff Needs

	Not at All	Occasionally	Unsure	Usually	Always
Pre-survey	8.3% (2)	25.0% (6)	16.7% (4)	50.0% (12)	0.0% (0)
Post-survey	6.9% (2)	31.0% (9)	13.8% (4)	48.3% (14)	0.0% (0)

Chi Square $x^2 = .285; p=.963$

The responses remained fairly constant between the two points in time. None of the respondents on the pre or post survey felt they always know the needs of staff. The number that usually know the needs of staff increased by 2, and the number that occasionally know increased by 3; these could both be the result of the higher number of respondents on the post-survey. The

number of participants that are unsure or not at all aware of staff needs stayed the same across both surveys.

Results Summary

Communication problems were recognized as the overarching theme from the focus groups. There were several categories of barriers related to communication. Staff identified solutions aimed at reducing the barriers to communication. Overall, results were not significant with the exception of one. However, the feedback gathered from the pre and post surveys is encouraging. The solutions implemented have reduced some of the barriers to communication, and highlighted the ongoing communication needs for the department. In order for effective change to occur, continued work on reducing barriers to communication is necessary.

Chapter 5

Discussion

Organizations are challenged with the amount of change that must be implemented as a result of state, national, and global initiatives. Along with incorporating evolving demands required by outside regulatory bodies, divisions and departments within organizations must manage their own initiatives. The eight cardiac operating rooms in this project are no exception.

There are a multitude of changes that occur in policies, procedures, and practice in the cardiac operating rooms. The number and timing of new practices was often unpredictable for staff. They did not always have a voice in the process. In order for staff to successfully implement new processes, they must be engaged. Communication problems amongst registered nurses, certified surgical technologists, and certified surgical assistants in the cardiac operating rooms were a concern. Quality patient care is dependent on all staff in the cardiac operating room being able to communicate and adapt to the rapidly changing environment. This project provided staff that opportunity.

Registered nurses, certified surgical technologists, and certified surgical assistants were given a voice to identify barriers to the current process for communicating and implementing change. Focus groups and staff development sessions allowed the entire team to be involved. Using an action research paradigm, staff identified solutions, and the team was responsible for the implementation. Allowing staff a forum to discuss their thoughts and concerns related to change opened the lines of communication. Ideas for change were brought forward that may otherwise not have been possible.

Communication

The overarching theme of communication was analyzed using multiple categories. All of the interventions were aimed at improving some type of communication, either between staff,

leadership, or the change process itself. Only one intervention was found to be statistically significant – the effectiveness of the process for updating surgeon preferences ($\chi^2 = 18.83$; $p=.001$). Developing and implementing this portion of the project took the most time and effort to complete. Education had to be provided on how to use the electronic application. The project lead spent many additional hours working individually with staff to enter the preferences electronically. In order to complete the conversion from paper to electronic, the project lead worked closely with the charge nurse to allow the necessary staffs work time for the project. Perhaps the intensity of this process may have contributed towards staff recognizing it as most valuable in nature. The tangible nature of this intervention may have also contributed towards improving staff satisfaction.

During the conversion process from paper to computer, there were many discoveries made about the electronic application. The templates available are not very user friendly. There is not an easy way to update one item that crosses all procedure choices, which is a barrier for staff. Since the staff had to enter each preference separately, waste was noted in the system. There are many options available for cardiac surgery procedures that are not used, but are available in the system as a choice. Going forward, staff would like to eliminate the unused ones to minimize confusion. Many of the issues identified are related to the computer program itself, and have been brought forward to information technology. Staff has begun the discussions of how to improve the current program.

Change process communication. The number of staff dissatisfied with the process for implementing change was not statistically significant, but descriptive data indicates a decrease from 15.4% to 7.1%. This could be a sign that the solutions identified by staff during the focus groups and staff development sessions may be making a difference. It is also possible that the

results are not significant because of the small number of participants who responded to the survey. The post-survey was used only three months after the initiation of the solutions. This may not have been enough time for staff to feel more satisfied with the new process compared to the old one, as they may still be adapting to the change. Moving forward, it may be helpful to reassess over a longer period of time to see if the changes really are improving their level of satisfaction with the new process.

Lack of knowledge about changes decreased almost 6%. This may be due to the use of multiple days of announcements at report, the weekly update, and the communication board. It will be important to continue using these avenues as ways to keep staff informed. Staff development sessions should be used as needed to communicate recent and upcoming changes, as well as to allow staff time to ask questions and have further discussion.

Staff communication. The majority of staff responding to the pre and post surveys reported communication problems as a barrier. This issue was initially identified during the focus groups, and remained a concern throughout the project. The institution where this project took place believes in a fair and just culture, and the ability to speak freely in a respectful manner. Staff have expressed that there is a fear of retaliation if they speak-up to certain individuals, and therefore choose not to say anything. This creates a tense working environment. Staff also expressed their frustrations when they are given feedback by their manager/supervisor about an issue instead of the individual directly. This also creates tension. The operating rooms are a complex environment, and staff needs to be able to communicate effectively with each other in order to provide the highest level of care possible. Moving forward, it is imperative that leadership explores ways to improve communication amongst the staff. Team building sessions and open forums may be one avenue to explore.

Interestingly, an increase in resistance to change was noted during the surveys. This increase may be due to chance. It is possible that there was not an increase in resistance, but is reflective of the increased number of post survey respondents. It may also be due to the mix of classifications that responded; if one classification was having more turmoil during the post-survey, they may have been more likely to respond. This is an area for future work to identify if there really is an increase in resistance, and if so, what specific factors are leading to the resistance.

Leadership communication. Survey responses that capture perceptions about lack of follow-through from leadership decreased 15%. Comments made on the survey provided further insight into staff perceptions of the process. Staff identified that there was a lack of input from those affected by the change. However, this project has helped them to realize they can have input as they participated in this action research process. It is also possible that this project may have increased the manager's and supervisor's awareness of the issue. The manager and supervisor were both present at the staff development sessions to view and discuss the results of the focus groups. Staffs also want to know the reasoning behind the new process to be implemented. This will be important for surgical leadership to remember when implementing future initiatives. There were several positive comments related to the weekly update provided to staff. The weekly update could also be a vehicle to disseminate the reasoning behind the changes that have occurred.

There were comments made throughout this project about the disparities between classifications. Managers are critical in creating an environment that promotes cohesion, which supports satisfaction and retention (Barrett et al, 2009). Keeping the social justice lens at the forefront, it will be important to have discussions with the cardiac team related to this issue, and

allow all an equal opportunity to speak. Staff should have an integral role in identifying solutions to improve the interactions and relationships of the cardiac team. Leadership will need to set clear expectations for all staff, and follow-through will be crucial.

Now that staff have been given the opportunity to have a voice in the change process, they have continued the discussions of how to improve and adapt. Miller (2004) discussed that if staff understand and experience what the outcomes can be through working together with a shared vision, empowerment results. The ongoing discussions may be a sign that staff now sees the value of this process. Leadership must be committed to engage staff in the change process, and monitor the outcomes continually (Costello et al, 2011).

Summary

There was much data gathered during the focus groups and staff development sessions. Using the solutions identified by staff allowed buy-in, and for them to take ownership during implementation. Although only one of the questions was statistically significant, there were trends in the right direction for all of the solutions, and overall satisfaction with the process. Understanding how the process for communicating and implementing changes affect staff can help guide future initiatives.

Project Limitations

There are several limitations to this quality improvement project. First, those that attended the focus groups may be the more vocal ones of the group, so marginalized staff still may not have been involved in the process. Even though the results of the focus groups were presented to the entire team at staff development, not all staff feels comfortable speaking up in this type of setting. Valuable input may have been missed. The focus groups were facilitated by a member of the cardiac team. This may have led to important details being missed, since they are

embedded in the culture of the group. An outside perspective may have been helpful. However, an insider view also allows nuances to be picked up that an outside view may not be able to detect.

There was not a power analysis done on the quantitative portion of this project. This was not done since this was a quality improvement project seeking to explore staff perceptions. The results of this study will only be applicable to this setting as intended by this project. Not applicable was only a choice on two questions; to be consistent, it should have been a choice on all questions.

The number of responses on the survey was small. The response rate varied from 48% on the pre-survey to 54% on the post-survey. The average response rate for an online survey is 30% (Instructional Assessment Resources, 2011). The typical response rate for an electronic survey at the institution where this project took place is 30%. Therefore, even though the total number of responses was small, the response rate was better than typical rates.

Finally, the project was carried out in only one department within a very large surgical division. This may have also been a positive, as each department has its own needs within the larger division. Caution should be used when applying these results to larger groups outside of the cardiac surgery department.

Recommendations

Practice Impact

This project used action research to improve processes in the cardiac operating rooms. The focus was on the process for communicating and implementing change. The process used can easily be applied in other practice settings, such as inpatient and outpatient nursing units; healthcare organizations, such as clinics and hospitals; and academic institutions.

Focus groups provide an opportunity for staff to have a voice. Krueger (2000) provides a guide for focus groups that can be tailored to the specific needs of a group of people. Using focus groups can provide very valuable information related to people's perceptions, feelings, and understanding of an issue; focus groups provide a crucial baseline.

Much can be gained from giving staff a voice in evaluating and formulating processes within the cardiac operating rooms. In order for changes and initiatives to be effective, buy-in from those that will be implementing them is essential. As discussed earlier by Miller (2004), people have the fundamental right to participate in decisions that affect their life. If those affected have a voice, they may be more willing to adapt.

This project simultaneously used the DMAIC framework for quality improvement and the ADKAR model for change. These tools can be used to successfully implement a variety of changes and initiatives in many settings. A framework such as this project used is needed to guide the quality improvement process.

The electronic pre/post survey used to assess satisfaction with the identified solutions was based on information provided by staff. By developing a tool in this manner, there was face validity. There are many tools available to measure staff satisfaction, but they are meaningless if not used in the correct context. Developing a survey with input from staff allows for interdisciplinary collaboration and teamwork. Creating a survey in this way will allow for better translation throughout the organization.

The overall impact on practice is that allowing individuals to be integrally involved in the process of change from beginning to end will allow the opportunity for buy-in, an enhanced sense of individual empowerment, and hopefully increased success in adoption of change.

Future Recommendations

The final results of this project were shared with surgery leadership at the institution in which it took place. By sharing the process with surgical leadership, others could see that things could be done differently in their areas. The project lead is available as a resource for future projects.

The DNP leader can take the process and concepts of this project and use them to guide systems change in clinical, educational, and community settings. Clinical settings can use the process to guide the implementation of new initiatives and practices that can involve staff and/or patients. Educational settings can use this process with faculty when implementing changes in curriculum. It can also be used with the students when planning for future curriculum changes that will impact them directly. Community leaders can use this change process by giving a voice to community members as the transformation is likely to affect large groups of people.

Policies and procedures guide organizations at many levels. This project had positive results from giving staff a voice in the cardiac operating room processes. The DNP leader can be the link between staff and organizational leaders to ensure staff have a voice in shaping policies and procedures that affect them.

Future research is needed to understand what creates resistance in groups. In addition, more information is needed as to how change processes should occur in healthcare organizations. Research is also needed to understand what the pace of the change process should be to allow transformation to occur and be sustained.

Conclusions

The process used for this project has highlighted the positive outcomes of a grassroots approach: Starting with the front line staff that has the most knowledge and expertise of the practice. Staff was given a voice and the opportunity to fully participate in a process that was focused on their perceptions and needs. From this effort, all involved started understand the barriers to effective change communication and implementation in the cardiac operating rooms. The result was an increase in motivation to continue efforts to further improve the processes in the cardiac operating rooms.

This project has provided the opportunity for future work in change implementation, and laid the groundwork for future improvements in the cardiac operating rooms. There are many quality improvement methodologies and change theories available. At the heart of any change must be social justice lens that guides the practice improvement. Giving staff a voice is one way to enact social justice in a process. Ongoing work in this area is essential to continue to build the knowledge base for quality improvement within the organization to improve patient outcomes.

References

- Ackley, B., Ladwig, G., Swan, B. A., & Tucker, S. (2008). *A clinical guide to evidence-based practice in nursing: Medical-surgical interventions*. St. Louis, MO: Mosby.
- American Nurses Association (2001). *Code of ethics for nurses with interpretive statements*. Silver Spring, MD: American Nurses Association.
- Barrett, A., Piatek, C., Korber, S., & Padula, C. (2009). Lessons learned from a lateral violence and team building intervention. *Nursing Administration Quarterly*, 33(4), 342-351.
- Bruckman, J.C. (2008). Overcoming resistance to change: Causal factors, interventions, and critical values, *The Psychologist-Manager Journal*, 11, 211-219.
- Butts, J.B., & Rich, K.L. (2011). *Philosophies and theories for advanced nursing practice*. Sudbury, MA: Jones & Bartlett Learning.
- Costello, J., Clarke, C., Gravely, G., D'Agostino-Rose, D., & Puopolo, R. (2011). Working together to build a respectful workplace: Transforming or culture. *AORN Journal*, 93(1), 115-126.
- Devos, G., Buelens, M., & Bouckenooghe, D. (2007). Contribution of content, contest, and process to understanding openness to organizational change: Two experimental simulation studies. *The Journal of Social Psychology*, 147(6), 607-629.
- Donahue, K. (2008). A move to universal or start times: A case study of leading change in an academic anesthesia department. *The Physician Executive*, January/February, 24-27.
- Donley, R. (2010). Nursing, social justice and the marketplace. *Health Progress*, May-June, 35-37.
- Hayman, B., Wilkes, L., & Cioffi, J. (2008). Change process during redesign of a model of nursing practice in a surgical ward. *Journal of Nursing Management*, 16, 257-265.

Heslin, M., Doster, B., Daily, S., Waldrum, M., Boudreaux, A., Smith, A., Peters, G., ...Rue, L.

(2008). Durable improvements in efficiency, safety, and satisfaction in the operating room. *Journal of the American College of Surgeons*, 206(5), 1083-1089.

Hiatt, J.M. (2006). *ADKAR: A model for change in business, government, and our community*.

Loveland, CO: Prosci Learning Center Publications.

Instructional Assessment Resources. (2011). *Determining an acceptable response rate*. Retrieved

from <http://www.utexas.edu/academic/ctl/assessment/iar/teaching/gather/method/survey-Response.php>

Kaiser Family Foundation. (2009). *Global Health*. Retrieved from

<http://www.kaiseredu.org/Issue-Modules/Global-Health/Background-Brief.aspx>

Kalb, K. (2009). *Nursing for social justice: Promoting human dignisty 24/7*. St. Paul, MN: St.

Catherine University.

Kwahk, K., & Kim, H. (2008). Managing readiness in enterprise systems-driven organizational

change. *Behavior and Information Technology*, 27(1), 79-87.

Krueger, R., & Casey, M. (2000). *Focus groups: A practical guide for applied research*.

Thousand Oaks, CA: Sage Publishing.

Lansisalmi, H., Kivimaki, M., Aalto, P., & Ruoranen, R. (2006). Innovation in healthcare: A

systematic review of recent research. *Nursing Science Quarterly*, 19(1), 66-72.

Leeman, J., Baernholdt, M., & Sandelowski, M. (2007). Developing a theory-based taxonomy of

methods for implementing change in practice. *Journal of Advanced Nursing*, 58(2), 191-200.

McJoynt, T. A., Hirzallah, M. A., Satele, D. V., Pitzen, J. H., Alberts, S. R., & Rajkumar, S.

V. (2009). Building a protocol expressway: the case of Mayo Clinic Cancer Center.

Journal of Clinical Oncology, 27, 3855-60.

Miller, A. (2004). Basil anthony moreau – educator for justice. *Perspectives for Business*, 1, 5-

12.

Parmelli E., Flodgren, G., Schaafsma, M., Baillie, N., Beyer, F., & Eccles, M. (2011). The

effectiveness of strategies to change organisational culture to improve healthcare

performance. *Cochrane Database of Systematic Reviews*, 1, 1-14.

Patton, M.Q. (2011). *Developmental evaluation: Applying complexity concepts to enhance*

innovation and use. New York, NY: The Guilford Press.

Periyakoil, V. (2009). Change management: The secret sauce of successful program building.

Journal of Palliative Medicine, 12(4), 329-330).

Roy, C. (2009). *The roy adaptation model*. Upper Saddle River, NJ: Pearson.

Roy, C. (2011). Extending the roy adaptation model to meet changing global needs. *Nursing*

Science Quarterly, 24(4), 345-351.

Suc, J., Prokosch, H., & Ganslandt, T. (2009). Applicability of lewin's change management

model in a hospital setting. *Methods of Information in Medicine*, 48(5), 419-428.

The Agency for Health Care Research and Quality (AHRQ) based on U.S. Preventive Services

Task Force (USPSTF) grades the quality of the overall evidence for a service on a 3-

point scale (good, fair, poor). Retrieved April 10, 2012 from:

<http://www.ahrq.gov/clinic/pocketgd1011/gcp10app.htm>

Tvedt, S., Saksvik, P., & Nytro, K. (2009). Does change process healthiness reduce the negative effects of organization change on the psychosocial work environment? *Work & Stress*, 23(1), 80-98.

U.S. Department of Health and Human Services. (2012). *What's changing and when*. Retrieved from <http://www.healthcare.gov/law/timeline/index.html>

Van Dam, K., Oreg, S., & Schyns, B. (2008). Daily work contexts and resistance to organizational change: The role of leader-member exchange, development climate, and change process characteristics. *International Association of Applied Psychology*, 57(2), 313-334.

Appendix A
Ranking the Level of Evidence

Level I: Evidence obtained from at least one large (multi-site) well-designed RCT (randomized controlled trial).

Level II: Evidence from a systematic review or meta-analysis of all relevant RCTs or evidence-based clinical practice guidelines based on systematic reviews of RCTs *or three of more RCTs of good quality that have similar results.*

Level III: Evidence obtained from well-designed controlled trials without randomization (i.e. quasi-experimental).

Level IV: Evidence from well-designed case-control or cohort studies.

Level V: Evidence from systematic reviews of descriptive and qualitative studies.

Level VI: Evidence from a single descriptive or qualitative study.

Level VII: Evidence from the opinion of authorities and/or reports of expert committees.

These ratings of the level of effectiveness are based on the text by Ackley, B., Ladwig, G., Swan, B. A., & Tucker, S. (2008). *A clinical guide to evidence-based practice in nursing: Medical-surgical interventions*. St. Louis, MO: Mosby.

Appendix B
Ranking the Strength of Evidence

Good: Evidence includes consistent results from well-designed, well-conducted studies in populations that directly assess effects on health outcomes.

Fair: Evidence is sufficient to determine effects on health outcomes, but the strength of the evidence is limited by the number, quality, or consistency of the individual studies, generalizability to routine practice, or indirect nature of the evidence on health outcomes.

Poor: Evidence is insufficient to assess the effects on health outcomes because of limited number or power of studies, important flaws in their design or conduct, gaps in the chain of evidence, or lack of information on important health outcomes

The Agency for Health Care Research and Quality (AHRQ) based on U.S. Preventive Services Task Force (USPSTF) grades the quality of the overall evidence for a service on a 3-point scale (good, fair, poor). Retrieved April 10, 2012 from:

<http://www.ahrq.gov/clinic/pocketgd1011/gcp10app.htm>

Appendix C
Level/Strength of Evidence for Multiple Sources

Study Type	Level	Strength	Articles
Original Studies	I	Poor	Devos et al., (2007)
Systematic Reviews	II	Good	Lansisalmi et al., (2006); Leeman, et al., (2007)

Appendix D
Email Invitation for Focus Groups

DATE

Dear Cardiac Surgery RN/CST/CSA,

You are invited to participate in a focus group to discuss the process for implementing change in the cardiac operating rooms. I am very interested in your perspective. It is hoped that this information will help improve our current process for implementing change.

Participation in the focus group(s) will involve coming in prior to the day shift, and may last 30-60 minutes. You will not be personally identified in any way. All focus group data will be analyzed as aggregate data and will not contain any identifying information. Please be assured that your answers are confidential. Protecting your confidentiality is very important to me. Your responses are anonymous and cannot be associated with the answers you give. If you choose to come to the focus group(s), please punch in. If there is an error on your time card related to the focus group(s), please contact your manager/supervisor. Managers/Supervisors will not participate in the focus groups. ***Attending the focus group will imply voluntary and informed consent.*** Once the data has been analyzed, it will be presented to the entire cardiac surgery team for discussion. In this meeting, managers/supervisors will be present.

I am the lead for this quality improvement (QI) project. You may contact me by calling (507) 255-7665. Although this is a QI project, I am also using data from this project as part of my doctorate program at St. Catherine University. The data collected through the focus group(s) will be analyzed and reported for the completion of the doctorate program at St. Catherine University School of Nursing. In any publications or presentations, I will not include any information that will make it possible to identify you as a subject.

Participation in the focus group(s) is completely voluntary, and your decision to participate or not will not affect your care or employment at Mayo Clinic. All information will be kept confidential in a secured, password protected electronic file. Data will be destroyed at the completion of this project.

This project is considered exempt from the Mayo Institutional Review Board (IRB). However, IRB approval was obtained from St. Catherine University. If you have other questions or concerns regarding this project and would like to talk to someone other than myself, you may also contact John Schmitt, PhD, Chair of the St. Catherine University Institutional Review Board, at (651) 690-7739.

Sincerely,

Amy White, MS, RN
Nursing Education Specialist
Cardiac Surgery
Division of Surgical Services - Department of Nursing

Appendix E
Focus Group Script and Questions

Introduction of Purpose: The purpose of this focus group is to gain an understanding from the cardiac operating room staff about the processes that occur when implementing changes in policies, procedures, and practice. I also want to understand the barriers in implementing these new changes in the cardiac operating rooms. Please do not share conversations or specific comments that are made during the focus group outside of this group. The information gathered today will be presented anonymously to the entire cardiac team during an upcoming staff development.

Opening Question	Can you tell us what you enjoy doing most when you're not at work?
Introductory Question	Tell us what you like about working in cardiac surgery.
Transition Questions	How do you hear about changes in policies, procedures, or practice in the operating room? Talk about your experiences.
Key Questions	What are your frustrations with the current process for communicating and implementing change(s)? What barriers do you face when changes are implemented in the operating room? How do you think change(s) should be communicated and introduced in the cardiac operating rooms?
Ending Questions	Are there other issues we should discuss related to how changes are implemented in the operating room? Is there anything you wanted to discuss but didn't get the opportunity to?

Appendix F
Email Invitation for Electronic Survey

DATE

Dear Cardiac Surgery RN/CST/CSA,

You are invited to complete an electronic survey to assess the level of satisfaction with the change process before and after implementation of the process changes proposed as a result of the focus groups held in May, and the staff development in July. The process changes include: providing staff information before changes are implemented; utilizing electronic resources for surgeon preferences; and implementing a communication board in the cardiac office. I am very interested in your perspective. It is hoped that this information will help improve our current process for implementing change.

The survey is electronic, and you will receive a link to the survey in your e-mail. Completing the survey should take no more than 5 - 10 minutes. You will not be personally identified in any way. All survey data will be analyzed as aggregate data and will not contain any identifying information. Please be assured that your answers are confidential. Protecting your confidentiality is very important to me. Your responses are anonymous and cannot be associated with the answers you give. ***Completing the survey will imply voluntary and informed consent.*** Once the data has been analyzed, it will be presented to the entire cardiac surgery team.

I am the lead for this quality improvement (QI) project. You may contact me by calling (507) 255-7665. Although this is a QI project, I am also using data from this project as part of my doctorate program at St. Catherine University. The data collected through the survey will be analyzed and reported for the completion of the doctorate program at St. Catherine University School of Nursing. In any publications or presentations, I will not include any information that will make it possible to identify you as a subject.

Participation in the survey is completely voluntary, and your decision to participate or not will not affect your care or employment at Mayo Clinic. All information will be kept confidential in a secured, password protected electronic file.

This project is considered exempt from the Mayo Institutional Review Board (IRB). However, IRB approval was obtained from St. Catherine University. If you have other questions or concerns regarding this project and would like to talk to someone other than myself, you may also contact John Schmitt, PhD, Chair of the St. Catherine University Institutional Review Board, at (651) 690-7739.

Sincerely,

Amy White, MS, RN
Nursing Education Specialist
Cardiac Surgery
Division of Surgical Services - Department of Nursing

Appendix G
Timeline for Systems Change Project

Activities	Timeline
Submit project proposal to IRB.	February/March 2011
Ongoing review and analysis of the literature related to systems change in the OR setting and the focus group data collection and analysis process.	January-April 2011
Individual focus groups will be held for RN, CST, CSA	May
Results of the focus groups will be presented to the entire cardiac group.	July 2011
Implement process changes identified by the cardiac operating room staff.	Fall 2011/Winter 2012
Ongoing evaluation and revision of process changes as needed.	Throughout
Final evaluation of process change effectiveness.	January 2012
Dissemination of results.	Fall 2012

Appendix H
Resources/Budget Table

Activity	Amount of time	People Involved	Hourly Rate	Cost
Focus Groups Preparation	7 hours	Project lead		In kind donation
Food provided		Project lead		\$50.00
Conduction of focus groups	6 hours	Project lead, 6 RNs, 4 CSTs, 10 CSAs	\$29.00	\$435.0 ¹
Analysis of results/ presenting results to staff	55 hours	Project lead		In kind donation
Developing Intervention Plan	15 hours	Project lead	NA	In kind donation
Enabling access to electronic program for surgeon preferences	2 hours	Project lead, Electronic Environment Staff (ESS)	Project lead: NA ESS: \$29.00	Project lead: In kind donation Electronic Environment Staff: \$58.00
Presenting intervention plan at staff development	2 hours	Project lead, cardiac surgery staff (CSS)	Project lead: NA CSS: \$29.00	Project lead: In kind donation Cardiac surgery staff: \$870.00 ²
Working with administrative assistant to format electronic survey	2 hours	Project lead, administrative assistant (AA)	Project lead: NA AA: \$29.00	Project lead: In kind donation Administrative assistant: \$58.00
Reviewing and analyzing data from pre-survey	5 hours	Project lead	NA	In kind donation

Appendix H
Resources/Budget Table (Continued)

Activity	Amount of time	People Involved	Hourly Rate	Cost
Discussing results of pre-survey, and setting timeline for interventions	2 hours	Project lead, cardiac surgery staff (CSS)	Project lead: NA CSS: \$29.00	Project lead: In kind donation Cardiac surgery staff: \$870.00 ²
Working with staff to enter surgeon preferences and initiate communication board	15 hours	Project lead, cardiac surgery staff (CSS)	Project lead: NA CSS: \$29.00	Project lead: In kind donation Cardiac surgery staff: undetermined ³
Compiling weekly update sent via email	12 hours	Project lead	NA	In kind donation
Working with administrative assistant to prepare post-survey	1 hour	Project lead, administrative assistant (AA)	Project lead: NA AA: \$29.00	Project lead: In kind donation Administrative assistant: \$29.00
Reviewing and analyzing data from post-survey, and comparing with pre-survey	20 hours	Project lead	NA	In kind donation
Disseminating results to staff; planning for continued improvements as needed	2 hours	Project lead, cardiac surgery staff (CSS)	Project lead: NA CSS: \$29.00	Project lead: In kind donation Cardiac surgery staff: \$870.00 ²

¹ Cost was figured by taking the minimum registered nurse salary, and multiplying by 1.5, since it was overtime for the staff to attend. This number was then divided in half, since the groups were 30 minutes long, and multiplied by 20 for the number of staff.

²Cost was figured by taking the minimum registered nurse salary, and multiplying by 30, the typical number of staff that attend staff development weekly.

³The project lead spent about 15 hours working individually with staff. The total amount of time spent entering preferences by staff is undetermined, and cannot be calculated.

Appendix I
Electronic Survey Questions

- 1) What is your current level of satisfaction with the process for implementing changes in policies, procedures, and practice in the cardiac operating rooms?

5 Very Satisfied	4 Satisfied	3 Neutral	2 Dissatisfied	1 Very Dissatisfied
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Comments:

- 2) Which of the following are barriers for you when implementing changes in policies, procedures, and practice in the cardiac operating rooms? (check all that apply)

Barriers related to change

Too many changes	Resistance to change	Lack of knowledge about change	Lack of involvement in the change	Lack of time
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Barriers related to staff

Not enough staff	Out of section staff	Staff don't follow policies and procedures
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Barriers related to leadership

Lack of follow-through from leadership
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Barriers related to communication

Communication Problems

Comments:

- 3) How effective is the current process for communicating changes in policies, procedures, and practice in the cardiac operating rooms?

5 Very Effective	4 Effective	3 Neutral	2 Ineffective	1 Very Ineffective
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Comments:

4) How effective is the current process for updating and maintaining surgeon preferences in the cardiac operating rooms?

5 Very Effective	4 Effective	3 Neutral	2 Ineffective	1 Very Ineffective
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Comments:

5) Are you aware of the needs (such as education, orientation, competency, committees) of RNs, CSTs, and CSAs in the cardiac operating rooms?

5 Always	4 Usually	3 Unsure	2 Occasionally	1 Not at all
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Comments: