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Improving Pain Management in the Cardiac Procedure Unit

Marisol Aquino
tating25@gmail.com

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University of San Francisco

School of Nursing and Health Professionals

Clinical Leadership Theme

The topic for my CNL Project is the pain management of patients in the Cardiac

Procedure Unit. According to the Department of Veteran Affairs (2000), pain is viewed as the

fifth vital sign, therefore pain is an essential indicator for the patients' well-being. Although

research and advanced treatments in improved practice protocols have documented

improvements in management of acute and postoperative pain, little awareness of the

effectiveness of best practices continues. Improved interventions can enhance patients' attitudes

to and perceptions of pain. What a patient believes and understands about pain is critical in

influencing the patient's reaction to the pain therapy provided. Use of interdisciplinary pain

teams can lead to improvements in patients' pain management, pain education, outcomes, and

satisfaction (Glowacki, 2015).

A CNL competency that directly supports this project is assuming the role of the

outcomes manager. As a CNL, I will use data to change practice and achieve optimal client

outcomes. The CNL synthesizes data, information and knowledge to evaluate and achieve

optimal client outcomes (AACN, 2007). This competency also uses performance measures to

assess and improve the delivery of evidence-based practices and promote outcomes that

demonstrate delivery of higher-value care. The CNL also assumes the role of an educator.

Educating the staff to effectively manage patient's pain is key in making an improvement

change. According to the White Paper (2007), communication is a complex, ongoing, interactive

process and forms the basis for building interpersonal relationships.

Statement of the Problem

The nurse communication patient satisfaction score of the Cardiac Procedure Unit (CPU)

is below the target of 69%. Providing quality of care is the department's top priority, so it is

important for the nursing team to appropriately anticipate, assess and manage patients' pain. The

mission statement of CPU serves as a guide in providing the best possible cardiac service as CPU

exists to consolidate the care of cardiac patients on one unit thereby increasing the experience of

its members. "Our commitment is to provide compassionate care in a nurturing environment.

We welcome your feedback and suggestions because not only do we care for you, we care about

you."

<center>**Project Aim**</center>

The goal of the project is to develop an effective pain management program for this

microsystem. One of the key factors in accomplishing the goal is to improve nurse

communication about the patient's comfort level during care transitions such as Nurse

Knowledge Exchange (NKE) and Authentic Hourly Rounding (AHV). Effective pain

communication during Nurse Knowledge Exchange (NKE) and Authentic Hourly Rounding

(AHV) consists of: develop and implement a standardized process for Nurse Knowledge

Exchange (NKE) that includes the patient's plan for pain; develop and implement a standardized

process for assessing and addressing pain and comfort during Authentic Hourly Rounding

(AHV); develop and implement a standardized pain management order set which includes

analgesics for as needed basis; develop and implement a standardized pain intervention during

femoral sheath removal.

<center>**Global Aim**</center>

We aim to increase the pain management scores in the Cardiac Procedure Unit. The

process begins with assessing why pain is not being identified and not treated accordingly. The

process ends when pain management scores from the HCAPHS satisfaction survey using STAR

rating system will improve from a baseline of 2 stars to 3 stars by December 2017.

Project overview

Cardiac Procedure Unit (CPU) specializes in the care of patients who are undergoing Coronary Angiography, Percutaneous Coronary Intervention (PCI) or Angioplasty, closure of Congenital Heart Defect, treatment of Heart Valve Stenosis, and implantation of Pacemaker. The day-to-day operations are composed of Registered Nurses (RNs), Patient Care Technicians (PCTs), Unit Assistant (UA), and Nurse Practitioners (NPs) who work hand in hand in caring for cardiac catheterization patients with an oversight from the Medical Director and Department Managers.

Patients' perception of pain in the CPU has continually followed a "see-saw" pattern and averages at about 50% according to HCAPHS report. The result is below the national standards. Patients are likely to experience pain when undergoing cardiac catheterization. Pain can induce severe complications and it may lead to further deterioration of the patient. Therefore, knowing how to manage pain in patients is an important part of systemic approach. (Cohen, et. al., 2004). Under-treated pain may also lead to the development of chronic pain which can be difficult to treat, adversely affecting the person's quality of life. Inadequately managed pain is linked with many adverse consequences including sleeplessness, anxiety, physiological stress responses including delayed gastric emptying, and increased myocardial oxygen demand (Malcom, 2015). It is an expectation for the staff to appropriately anticipate, assess and manage pain. One of the barriers of the project is the unwillingness of some patients to ask for help when in pain. Examining at how different cultures perceive pain is important. Some cultures do not see the need for analgesics and would rather bare the pain (Wingfai & Bhuvanakrishna. 2014). Some cultures also still have the stigma that one will get addicted to pain medication. Patient teaching is necessary in order to actively manage pain and minimize anxiety about taking pain

medication. There also appears to be a gap between the assessment of pain and implementing

strategies to manage pain. Routine screening for pain should be coupled with a comprehensive

assessment and targeted pain interventions. The improvement theme for this project is based on

the IHI's quadruple aim: improved population health; reduce care cost; satisfied patients;

satisfied providers.

Effective pain communication during Nurse Knowledge Exchange (NKE) and Authentic

Hourly Rounding (AHV) includes:

- Develop and implement a standardized process for Nurse Knowledge Exchange (NKE)

    that includes the patient's plan for pain and complete pain documentation.

- Develop and implement a standardized process for assessing and addressing pain and

    comfort during Authentic Hourly Rounding (AHV) and use of pain intensity scales.

- Develop and implement a standardized pain management order set which includes

    analgesics for as needed basis.

- Develop and implement a standardized pain intervention during femoral sheath removal.

Based on the Team Stepps framework, I choose the situation monitoring principle of

continually scanning and assessing the progress of the pain management project in CPU.

Success of this pain program requires engagement from all stakeholders. A shared mental model

is the result from each team member maintaining situation awareness and ensuring that all team

members are "on the same page." It is important to improve communication about pain

management for patients during nursing transitions in care such as NKE and AHV. Improved

communication should result in consistent pain management approaches between caregivers and

improved patient satisfaction with nurse communication.

Literature Review

Pain is something any patient may experience during hospitalization and affects patient satisfaction with their care. Can better communication about pain management for cardiac catheterization patients during nursing transitions in care such as NKE and AHV improve pain satisfaction scores? The terms "pain" and "pain management" were used in the literature search. The research was limited to the English language and published in the last 7 years (Appendix C).

In a descriptive cross-sectional study using electronic database of vital signs and pain scores in 2010, Carr, Meredith, Chumbley, Killen, Prytherch, and Smith (2014) wanted to prove that patients do experience clinically significant pain during their hospital stay and at discharge. After analyzing a total of 810,774 pain scores with an actual 38,451 patient stays, pain was present in 38.4% of patient stays. Only 0.2% of pain assessments were made with just the use of vital signs. Reducing the risk of long-term persistent pain should be seen as integral to improving patient safety and can be achieved by harnessing organizational pain management processes with quality improvement initiatives. The assessment of pain alongside vital signs should be reviewed. Setting quality targets for pain are essential for improving the patient's experience (Carr et al., 2014).

The personal values of the clinician may be a key driver of pain-management decision making. Using a qualitative method, the study done by Bernhofer, Hosler, and Karius (2016) examined the written answers to questions posed to nurses regarding any practice changes they have made to caring for patients with pain after participating in a class that included a segment on personal values. In April 2014, twenty clinical registered nurses in a Midwestern hospital setting attended a pain class and provided written answers to two open-ended interview questions. After analyzing the data, four themes were identified among the answers provided by

nurses: understanding the patient, importance of pain education, nurse's self-awareness, and

interpretation of personal values. Nurses who learned how their personal values affect

their pain management decisions described new insights into their own approach

to pain management (Bernhofer, E. et al, 2016).

Despite numerous quality-improvement projects and treatment policies and procedures

on pain management, a majority of patients continue to experience significant pain during their

hospitalization thus producing negative effects on their physical, psychological, and social well-

being. A point-prevalence study was conducted by Zoega, Sveinsdottir, Sigurdsson, Aspelund,

Ward, and Gunnarsdottir (2015) thru collection of data from the American Pain Society Patient

Outcome Questionnaire (Icelandic version). The study was based on the response to pain

assessment by 308 adults over 18 years old, 49% male and hospitalized for more than 24 hours.

The response rate to the survey was 73% with 35% experiencing severe pain in a 1-10 pain scale.

The study showed that the amount of pain the patients felt prevented early mobility and sleep

disturbances. Pain was both prevalent and severe in the hospital, but patient participation in pain

treatment decision making showed correlation to better outcomes. Optimal pain management,

with emphasis on patient participation in decision making, should be encouraged in an effort to

improve the quality of care in hospitals (Zoega et al., 2015).

Rationale

HCAHPS (the Hospital Consumer Assessment of Healthcare Providers and Systems) is a

patient satisfaction survey required by CMS (the Centers for Medicare and Medicaid Services)

for all hospitals in the United States. The Survey is for adult inpatients, excluding psychiatric

patients. Using data from the 11 HCAHPS measures publicly reported on Hospital Compare,

CMS created 11 HCAHPS star ratings. Star ratings for composite topics combine multiple

questions from the HCAHPS Survey. Star ratings for individual and global topics represent

individual questions on the HCAHPS Survey. The composite topics include: nurse

communication, doctor communication, responsiveness of hospital staff, pain management,

communication about medications, discharge information and care transition. As part of the

Centers for Medicare & Medicaid Services (CMS) initiative to add five-star quality ratings to its

Compare Web sites, this source of information makes it easier for consumers to use the

information to compare hospitals and recognize excellence in quality of service. Updated scores

will be posted weekly as the organization transitions to the CMS STAR ratings for the 2017

performance goals. The management team is in the process of training, and learning how to

access the tools and resources provided by the National Care Experience Analytics to improve

measures.

A key provision of accountable care organizations (ACOs) is value based purchasing

(VBP), which directly links payment to quality of care. The Hospital Value-Based Purchasing

(VBP) Program is a Centers for Medicare & Medicaid Services (CMS) initiative and was

established for traditional Medicare, offering financial incentives to hospitals to improve the

quality of care (Penner, 2017). ACOs must demonstrate application of evidence-based practice

(EBP), care coordination, quality indicators, and quality improvement efforts. In addition, ACOs

must develop processes ensuring patient engagement and patient centered care. Based on the

Hospital VBP Program for 2017, one performance measure under HCAHPS survey is pain

management. To help achieve this measure, the CNL is responsible for the clinical management

of comprehensive client care, for individuals and clinical populations, along the continuum of

care and in multiple settings, including virtual settings (AACN, 2007).

When pain and other discomfort are better controlled, patients are able to ambulate sooner and avoid any delay in their discharge process. The aim of this project is to organize a comprehensive pain education plan for the CPU staff. Initiating awareness of the HCAPHS pain score from the previous year to the current year is the first step in addressing the pain management in CPU. During the in-service, the following topics will be addressed to build engagement for the changes proposed: describing the most important factors of pain management in CPU patients, standardized pain assessment and pain assessment tools, identifying aggravating factors after cardiac procedures, proposing strategies of pain control measures for facilitating effective pain management, and developing a program wherein patients can participate in their pain treatment decision making. It is essential to educate the nurses on proper documentation of pain assessment and the effect of pain interventions. Notation of such will allow communication among clinicians about the current status of patient's pain and responses to the plan of care. The Joint Commission requires documentation of pain to facilitate reassessment and follow-up (Wells, Pasero, & McCaffery, 2008).

Cost Analysis

The cost of educating each staff member would require allocating a 2-hour in-service initially (Appendix A). CPU is staffed with 40 staff members in total and the estimated cost to educate everyone would be $4,800. An additional $600 will be utilized for teaching materials necessary for the pain education. A proposed staff meeting twice during the initial year and the following years costing another $4,800 is important because continued education and evaluation of the project help the nursing team see the progress and build a sense of achievement. Constant check in provides an opportunity to reflect and learn from what the team has done, assess the outcomes and effectiveness of a project and think about new ways of doing things. The initial

cost to start this educational project is a total of $10,200 towards the primary benefit of

decreasing length of hospital stay. If a day of hospitalization costs $3,500 per patient, one

patient per month would create a saving of $42,000 total for the year. If the length of hospital

stay is decreased for just three patients during the first year, the initial investment of $10,200 will

be covered entirely. The more patients who will go home as scheduled and prevent any

additional hospital stay will save the hospital more money. Therefore, the return of investment is

high (Appendix G). The secondary benefits include improved HCAPHS scores in patient

satisfaction scores and pain management and improved customer service and retention. This

enhanced pain management can lead to an important reduction in length of stay, therefore,

increasing patient throughput and hospital capacity.

This project is important to ensure cost effective care because of the regulatory changes

in reimbursement. Properly addressing patients' pain and discomfort can increase HCAPHS

scores in patient satisfaction and pain management. It will retain and gain more patients by

maintaining a high standard of care and great reputation within the healthcare community. Pain

management promotes early ambulation and decreases length of stay.

Methodology

We aim to increase the pain management scores in the Cardiac Procedure Unit. The

process begins with assessing why pain is not being identified and not treated accordingly. The

process ends when pain management scores from the HCAPHS satisfaction survey using STAR

rating system will improve from a baseline of 2 stars to 3 stars by December 2017. An effective

pain management program for the CPU includes the following: staff education about the pain

protocol; standardization of patient rounding and nurse hand-off; guidelines for pain intervention

using analgesics especially during femoral sheath removal, and effective communication

between nurse and nurse practitioner/physician. By communicating effectively and working

with physicians as a team, nurses can provide ideas for interventions and advocate constructively

for patients. Through the formation of nurse-physician work groups, communication and

teamwork are improved between these members. Because these meetings are led primarily by

RNs, the historic stacked hierarchal structure of nurses and physicians is altered.

Multidisciplinary committees including nurses and physicians should be formed. Ideally the

goal that with improved perceptions of nurse-physician teamwork, both groups will feel more

comfortable interacting with each other and participating in shared decision making and

ultimately providing a culture of safety for patients and health care team members alike

(Streeton, 2016).

The change being implemented in this microsystem is pain education. Providing the

nursing team with an in-service and informational handouts, setting standards of care, embracing

the key concepts of pain management, and creating an environment of accountability are vital to

the department's pain performance. Nursing units in hospital settings are primarily shift-based

work environments where continuity of patient care needs to be maintained throughout all shifts;

nursing performance and care outcomes in previous shifts can influence the workload of those

working during subsequent shifts. Thus, care quality and subsequent health outcomes of patients

depend upon effective communication between nurses (Kim & Oh, 2016). Pain champions will

be designated to the members of the Unit Council to assist in dissemination of information and

sustainability of the project. Continued reinforcement by leaders is key in the achievement of the

goal. The SWOT (Strengths, Weaknesses, Opportunities, Threats) matrix is a tool that helps in

identifying and analyzing the SWOT related to a decision, project, or capital expenditure

(Penner, 2017). (See Appendix H).

Theoretical Framework

Lewin's Change Model is a great framework to follow in order to guide practice change. Lewin's Model is straightforward and can be easily followed by staff. The first stage, "Unfreezing," focuses on bringing awareness to pain management. Educating staff with repercussions of complications due to unmanaged pain may help decrease incidents. Success depends on continuing to develop a sense of teamwork and active communication among those members of the department engaged directly in the change effort and the other members of the organization who have a stake in the outcome. It is essential that the change agents—especially managers, project team members, and consultants—provide visionary leadership that enables the process, rather than micromanagement that inhibits the change (Levasseur, 2001). Current practice need to be examined to begin the change and staff education in improving caregiver communication is imperative in addressing pain control. A crucial step in building momentum is when staff are well informed. Informational fliers on the types of pain, levels of pain, and effects of pain physically and psychologically are some of the important pieces of information necessary to promote pain awareness. The expectation of staff to round on each patient every hour highlighting patients' comfort will be reiterated during huddles, staff meetings, and annual skills day, so that all members of the team will be on the same page.

The second stage, "Moving," will work towards changing current practice in order to increase pain management by creating goals and objectives. A fundamental principle of effective change management is that people support what they help create. Active participation by the affected parties in the change process is the most important element of effective change (Levasseur, 2001). Staff will be randomly audited weekly by direct supervisor to ensure patients pain is being addressed during NKE and AHV. Attending to patients' comfort, safety, and

environmental needs may prevent adverse events like unrelieved pain; and contribute to patients'

satisfaction with nursing care (Halm, 2009). During daily huddle, staff will be reminded to

utilize tools and tips given during the in-service regarding the standardized pain protocol and

consistency with nursing care for patients.

     The third stage, "Refreezing," focuses on putting the intervention into action while

simultaneously preventing old habits to occur. Successful refreezing requires a commitment to

remain actively involved until required new behaviors have replaced those that existed prior to

the change. This does not happen overnight or without ongoing support to the organization

attempting to institutionalize the change (Levasseur, 2001). Continued education and evaluation

of the project help the nursing team see the progress and build a sense of achievement.

     By following Lewin's Model, I believe that pain or discomfort associated with cardiac

catheterization will be managed effectively, thus achieving the goal of this project. Pain and

pain management will be discussed during the daily morning huddle. Staff will also be randomly

chosen weekly to teach back information given at the in-service and information from the

informational fliers. Continued education, reinforcement, and monitoring are needed in order for

this project to succeed.

Evaluation

     Management will have constant reminders for staff until survey scores are satisfactory.

Printed announcements regarding pain will be posted in staff break room in case staff members

were not present during the morning huddle. Staff will initial the announcement to confirm that

they have read the information. Nurse leaders and pain champions of the department will

continue to support and educate the staff regarding new procedures, or any updates regarding

pain performance. Nurse leaders will check on patient's comfort during their daily patient

rounding which will validate the teachings about pain during NKE and AHV. Making hourly

rounds is another apparatus in nurses' toolkit to advance nursing quality outcomes (Halm, 2009).

Random patient charts will be audited to ensure pain score is being documented and re-

assessment of pain after pain intervention.

<div align="center">**Timeline**</div>

The timeline for this project involves several months of gathering baseline data as the

start-up phase. The initial phase encompasses the preliminary meeting with stakeholders

involved, data gathering and project planning. This phase takes place between the months of

May 2017 to August 2017 (Appendix F). The second phase is the implementation of pain

education for the nursing staff in the microsystem utilizing the Model for Improvement with

Plan-Do-Study-Act (PDSA) cycles (Appendix K). According to Nelson et al. (2007), the Model

for Improvement serves as a structure to test ideas with anticipated improvements. The final

phase is to re-assess and evaluate the initial results of the project with the stakeholders

(Appendix G).

<div align="center">**Expected Results**</div>

Through effective communication between nurses, doctors and nurse practitioners in

pursuing effective pain interventions, patient's perception that pain was managed will increase as

reported in the STAR ratings from HCAPHS survey. Patient experience scores are also directly

associated with clinical quality measure scores. When patients have desirable hospital stay, it

could also mean high quality measures. Better patient experience scores could indicate that a

hospital has stronger teamwork, organizational leadership, and commitment to improvement,

characteristics that could be associated with better quality measures and patient experience

scores (Mehta, 2015).

Nursing Relevance

The prevalence of pain across different patient populations is important, but assessment of the pain intensity is also imperative, as it can provide a predictor of the impact of pain on physical function (Carr, Chumbley, Prytherch & Smith, 2014). An effective pain management program for the CPU includes the following: staff education about the pain protocol, standardization of Authentic Hourly Rounding (AHV), and Nurse Knowledge Exchange (NKE) that includes the patient's plan for pain, set guidelines for pain intervention during femoral sheath removal, and a pain management order set which includes analgesics for as needed basis. Patient education is important to emphasize the effects of ineffective pain to the body and review the different pain treatment options, both pharmacologically and non-pharmacologically. An astute nursing judgement is crucial because pain can be verbal and non-verbal. Patient-centered care will also require having knowledge of barriers to pain management and then developing a plan with the patient to identify solution to overcome barriers to the patients experience of pain. Effective pain management results in better patient outcome and care experience, creates cost saving for the hospital by increasing patient throughput and hospital capacity.

Project Summary

Inadequately managed pain can lead to adverse physical and psychological patient outcomes for individual patients and their families. Of particular importance to nursing care, unrelieved pain reduces patient mobility thus resulting in complications. Negative changes in condition negatively affect the patient's welfare and the hospital performance because of extended lengths of stay and readmissions, both of which increase the cost of care (Wells et al, 2008). Pain control in CPU is a constant problem that has not been resolved. The goal of the project is to develop an effective pain management program for this microsystem which begins

by organizing a comprehensive pain education plan for the CPU staff. It is important to improve communication about pain management for patients during nursing transitions in care such as Nurse Knowledge Exchange (NKE) and Authentic Hourly Rounding (AHV). Effective pain communication during NKE and AHV consists of: develop and implement a standardized process for Nurse Knowledge Exchange (NKE) that includes the patient's plan for pain; develop and implement a standardized process for assessing and addressing pain and comfort during Authentic Hourly Rounding (AHV); develop and implement a standardized pain management order set which includes analgesics for as needed basis; develop and implement a standardized pain intervention during femoral sheath removal. The improvement theme for this project is based on the IHI's quadruple aim: improved population health; reduce care cost; satisfied patients; satisfied providers. Lewin's Change Model is a great framework to follow in order to guide practice change. The review of literature shows clear explanation that inadequate pain management reduces patient mobility, develops complications, increases length of hospital stay, and promotes poor patient satisfaction. Improved communication should result in consistent pain management approaches between caregivers and improved patient satisfaction with nurse communication. Besides the initial pain in-service, an additional 1-hour in-service twice a year will be provided as continued education and evaluation of the project help the nursing team see the progress and build a sense of achievement. Quality improvement requires essential elements for success: fostering and sustaining a culture of change and safety, developing and clarifying an understanding of the problem, involving key stakeholders, testing change strategies, and continuous monitoring of performance and reporting of findings to sustain the change (Hughes, 2008).

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Appendix A

COSTS

Category	Details	Initial Cost (2017) /	2018
Education	Initial 2-hr pain inservice - all staff 40 staff, average of $60/hour	$4,800	n / a
Education	Teaching materials	$600	$600
Education	1-hr staff meeting twice a year to check progress	$4,800	$4,800
Total		**$10,200**	**$5,400**

PRIMARY BENEFIT

Benefit	Savings within 12 months	Succeeding Years
Decrease length of stay **A day of hospitalization per patient = $3,500**		
1 patient per month X 12 months	**$42,000**	**$42,000**
(more patients, more savings)	**$$**	**$$**
Total	**$42,000**	**$42,000**

BENEFIT COST ANALYSIS

Net Benefit = Total Benefit – Total Cost

$= \$42,000 - \$10,200$

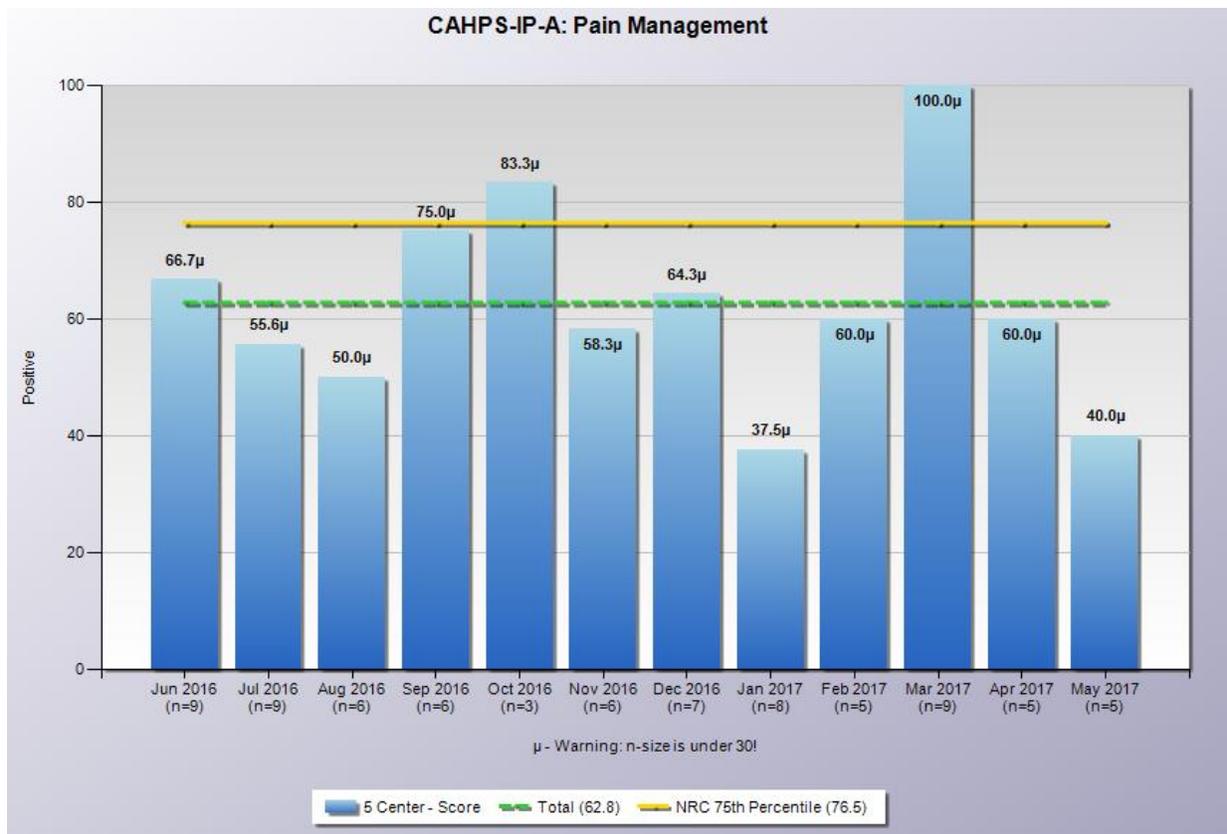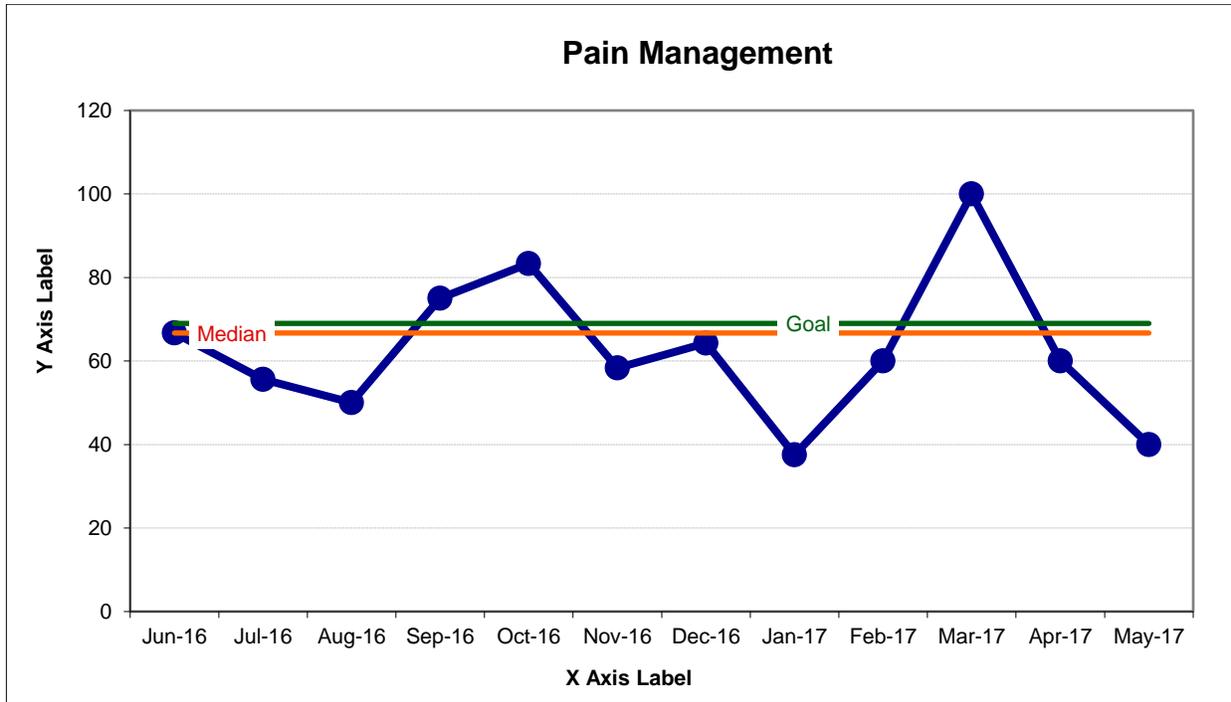$= \$31,800$

Benefit/Cost Ratio = Net Benefit / Total Cost

$= \$31,800 / \$10,200$

$= 3.1$

$3.1 > 1$

Appendix B

Baseline data with run chart

Appendix C
Family of Measures

Measure Description

Measure	Measure Definition	Data Collection source	Goal
	N = numerator D = Denominator		
Nurses initial that they have participated in in-service/huddle and/or staff meeting (Process)	N= Number of nurses at huddle/meeting D = Total number of nurses on unit	Observational study Sign-in sheet	100% completion
30 random patient chart audits will be checked to see if nurses assessed pain per policy every 4 hours (Process)	N = Number of patients who were assessed for pain D = Number of patients	Chart review – Health Connect Infoview	90% completion
Leader rounding interviews will be conducted to collect baseline information on patient's perception of pain	N = Number of patients who responded from interview	Data collection Interview	100% completion

and effectiveness of pain communication during NKE & AHV (Process)	D = Number of patients rounded	Real-time observation	
Interview data will be collected & 90% pts were comfortable (Outcome)	N = Patients that were interviewed D = Patients reported no pain	Data collection	100% completion
Surveys will be completed and 69% reported pain was managed appropriately (Outcome)	N = patients that filled out survey D = Patients discharged from unit	HCAPHS Catalyst STAR ratings	70% completion

Balancing		
A negative connotation arises from the demand of the project	People Pulse Survey	**60%**

Team Composition; sponsors

Population Criteria

CPU patients

Team

CPU staff

CPU Unit Council

Unit leaders

Nurse Practitioners

Sponsors

Bridget Williams

Nancy Taquino

Measurement strategy

Data Definitions

Data Element	Definition
Huddle	Information will be disseminated during daily morning meeting, monthly staff meeting and annual Skills Day. Staff will initial that they have read information.
Posted Announcement	An announcement will be posted in the break room and pillars around unit.
Survey	Catalyst surveys will be mailed to patients after discharge from hospital.
Catalyst	Data collection agency (National Research) that helps hospitals improve scores with CMS requirements on specific CAHPS

	programs and can also help with customer experience.
HCAHPS	Hospital Consumer Assessment of Healthcare Providers and Systems
CMS	Centers for Medicare & Medicaid Services
Pain	Physical or mental suffering or discomfort experienced by patient

Appendix D
Evaluation Table

Citation	Conceptual Framework	Design/ Method	Sample/ Setting	Variables Studied and Their Definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
O'Leary, Thompson, Landler, Kulkarni, Haviley, Hahn, Jeon, Wayne, Baker, Williams, 2010	None	Cross Sectional Study during a 4-week period in June 2007 Purpose: Nurse-Physician Communication Method: During a one-month period, randomly selected hospitalized patients, their nurses and their physicians were interviewed whether communication had occurred, and about six aspects of the plan of care.	310 (91%) and 301 (88%) of 342 eligible nurses and physicians completed interviews. Two internists rated nurse–physician agreement on aspects of the plan of care as none, partial or complete agreement. Measures included the percentage of nurses and physicians able to identify one another and reporting communication and the percentage of nurse–physician pairs in agreement on aspects of the plan of care. The study was conducted at a 753-bed academic hospital in Chicago, Illinois	Nurses (N=310) Physicians (N=301) Participant characteristics are: The majority (84%) of the patients were admitted via the emergency department, and half (51%) were admitted at night. Approximately two-thirds (64%) of the patients were admitted to the teaching service and one-third (36%) to the hospitalist service.	A structured interview instrument was designed to characterize nurse–physician communication and assess understanding of patients' plan of care.	The Nurse–Physician Summary Agreement Score was not significantly different when comparing nurse–physician pairs in which neither the nurse nor the physician reported communication with pairs in which both reported communication had occurred (mean score 7.63 vs 7.78, p=0.67).	Nurses and physicians did not reliably communicate with one another and were often not in agreement on the plan of care for 26 hospitalized medical patients.	Strengths: Studies show improved perceptions of collaboration among providers, but understanding of the plan of care has not been assessed. Limitations: Findings reflect the experience at one hospital highlight that communication is often suboptimal even when it occurs, which is valuable for healthcare workers to consider in a variety of settings. Future studies should evaluate the connection between the quality of nurse-physician communication and actual preventable adverse events. **Level III, B**

Citation	Conceptual Framework	Design/ Method	Sample/ Setting	Variables Studied and Their Definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Kim & Oh, 2016	none	Grounded theory methodology was used in this study The purpose of this study was to generate a substantive model that accounts for the explanatory social processes of communication in which nurses were engaged in clinical settings in Korea.	A total of 15 clinical nurses, all female participated in the in-depth interviews. Eligible study participants included registered nurses who had three or more years of experience in clinical nursing. Participants were recruited from general hospitals in three Korean cities	Phase I: Getting to know unspoken rules - Receiving strong disapproval - Learning by observing Phase II: Persevering within the culture - Going silent - Doing what is acceptable - Minimizing distress Phase III: Acting as a senior nurse - Enjoying the advantages - Taking responsibility	All interviews for this study were conducted in person at a participant-chosen time and location, including in small hospital conference rooms, the researcher's office, or a quiet spot near a participant's workplace. Interviewers and participants in this study	The initial purposive sampling was done to identify "good informants," then theoretical sampling was performed throughout the study to saturate previously-emerged codes and categories and to gain variation of categories in their properties and dimensions with varying conditions as much as possible.	The results of this study illustrated how the hierarchy-based culture in nursing units was applied and reinforced via communication between organization members in Korea. The results also demonstrated that a culture that emphasizes organizational rigidity, exclusivity, and hierarchy serves as a serious obstacle to active communication within an organization and as a mechanism that can lead to difficult transitions for nurses.	Strengths: Methods credible Limitations: sample size was small, and only one hospital was used which could affect generalizability and selection bias. **Level III, B**

| | | | | | | | were all female. | | | |

Citation	Conceptual Framework	Design/ Method	Sample/ Setting	Variables Studied and Their Definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Carr, Meredith, Chumbley, Killen, Prytherch, & Smith, 2014	none	A descriptive cross-sectional exploratory design A large electronic pain score database of vital signs and pain scores was interrogated between 1st January 2010 and 31st December 2010 to establish the proportion of hospital inpatient stays with clinically significant pain during the hospital stay and at discharge.	The study sample comprised all documented pain scores for hospital admissions where the in-hospital stay finished between 1 January 2010–31 December 2010. The study took place at a National Health Service District General Hospital on the South Coast of England, UK. The hospital manages ~140,000 admissions per year in ~1200 inpatient beds on a single site.	Adverse events, epidemiology and detection, nursing, pain, pain assessment, patient safety, quality improvement. Pain was assessed using a verbal rating scale (VRS) and had four categories – 0 (no pain), 1 (mild pain), 2 (moderate pain) and 3 (severe pain).	A commercial electronic system for the routine documentation and charting of vital signs, including pain scores, at the bedside using hand-held devices (Smith et al. 2006, 2009) was used during the study.	The database system has demonstrated good reliability and validity Several authors have compared different pain intensity rating scales and have concluded that a verbal pain rating scale is a valid and reliable measure of pain	A total of 810,774 pain scores were analyzed, representing 38,451 patient stays. Clinically significant pain was present in 384% of patient stays. Across surgical categories, 540% of emergency admissions experienced clinically significant pain, compared with 480% of elective admissions. Medical areas had a summary figure of 265%. For 30% patients, clinically significant pain was followed by a consecutive clinically significant pain score. Only 02% of pain assessments were made independently of vital signs.	Strengths: A major strength of our study is that the data were entered directly into electronic devices at the bedside as part of routine clinical care, thereby eliminating transcription error and facilitating subsequent retrieval and analysis of data. Limitations: It has been conducted at a single hospital and the work needs to be replicated in another institution. **Level III, B**

| Citation	Conceptual Framework	Design/ Method	Sample/ Setting	Variables Studied and Their Definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Glowacki, 2015	none	An NDNQI pain study, Coordinating Center for Dissemination and Implementation of Evidence-Based Methods to Measure and Improve Pain Outcomes, was initiated in March 2011.	A total of 400 hundred hospitals in the United States participated in phase 1 of the study, which began in March 2011 and included administration of the survey/questionnaire to patients in the 400 hospitals.	Five identified dimensions contribute to pain management. The dimensions have physiological, sensory, affective or cognitive, and sociocultural components unique for each patient that should be considered.	At Mercy Hospital of Buffalo, distribution of the survey/question naire prepared by the NDNQI and approved by the hospital institutional review board was administered to the patients by trained registered nurses. A p < 0.05 considered statistically significant.	Relevant data for this research can be grouped into three categories: patient characteristics, procedural characteristics and complications. These data were collected from the medical and nursing files.	The results strongly linked the team's initiatives with improved pain management and a continuance of increased improvement in patient satisfaction scores after the completion of the study in May 2012. The interdisciplinary team approach in pain management is a complex yet fundamental part of providing excellence in patient care. The team approach provides important insight for patients and is highly correlated with improved patient recovery, outcomes, knowledge, and satisfaction.	Strengths: Studies show improved perceptions of collaboration among providers, but understanding of the plan of care has not been assessed Limitations: Findings reflect the experience at one hospital. Future studies should evaluate the connection between the quality of nurse–physician communication and actual preventable adverse events. **Level III, B**

Appendix E

Timeline

	5/24	6/7	6/14	6/28	7/5	7/23
Clinical Leadership Theme	X					
Project Aim		X				
Global Aim		X				
Statement of the Problem		X				
Project overview		X				
Budget		X				
SWOT Analysis			X			
Methodology			X			
Action Plan				X		
Evaluation					X	
Data Source/Literature Review						X
Expected Results						X
Nursing Relevance						X

Appendix F

Driver Diagram

AIM

We aim to improve nurse communication of pain level during Nurse Knowledge Exchange (NKE) and Authentic Hourly Rounding (AHV) in an effort to increase the pain management scores via STAR system from a rating of 2 to 3 in the Cardiac Procedure Unit by December 2017.
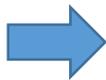
Primary

Develop and implement a standardized process for Nurse Knowledge Exchange (NKE) and Authentic Hourly Rounding (AHV) that includes the patient's plan for pain.
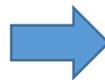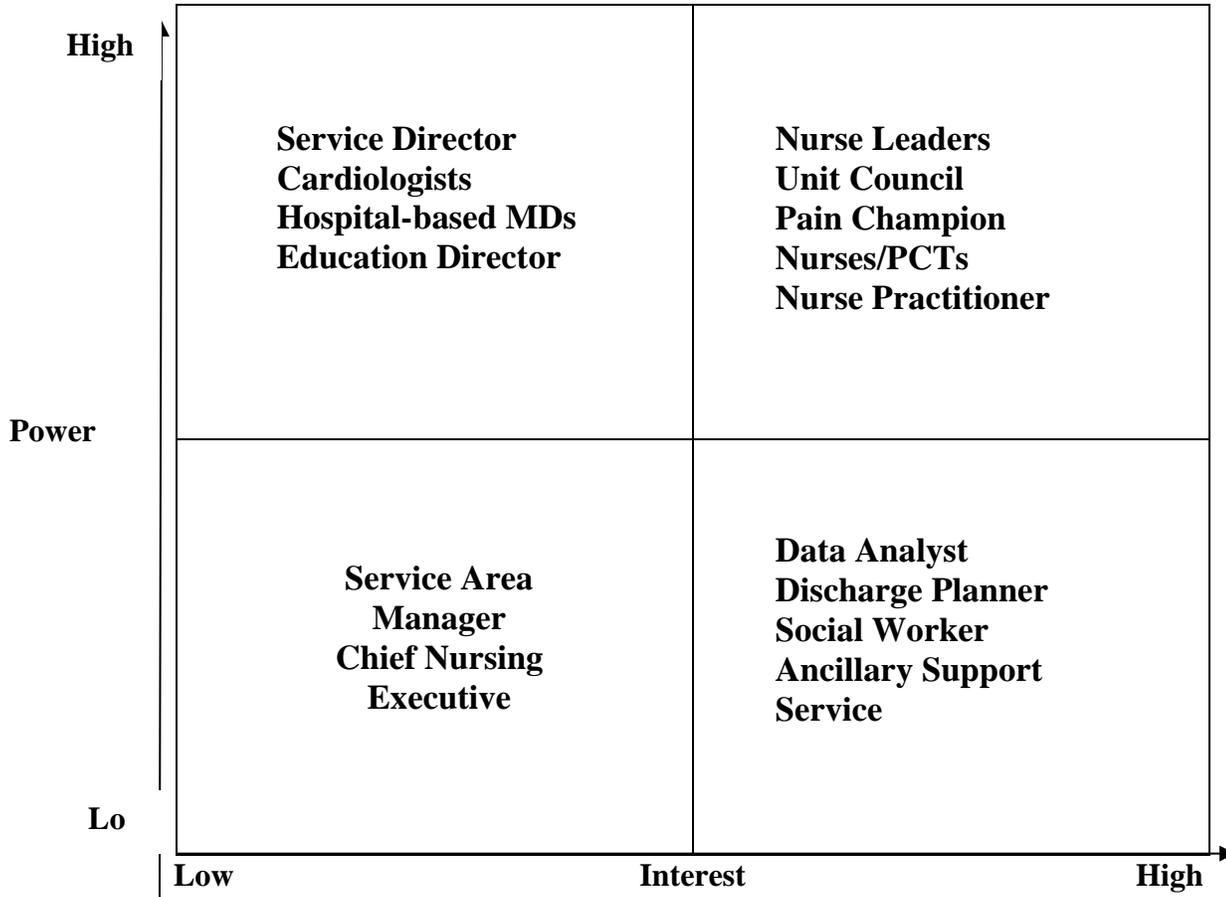
Secondary

Develop and implement a standardized pain management order set.

Develop and implement a standardized pain intervention during femoral sheath

Appendix G

Stakeholder Analysis

High		
Power	Service Director Cardiologists Hospital-based MDs Education Director	Nurse Leaders Unit Council Pain Champion Nurses/PCTs Nurse Practitioner
Lo	Service Area Manager Chief Nursing Executive	Data Analyst Discharge Planner Social Worker Ancillary Support Service
	Low **Interest** **High**	

Appendix H

SWOT Analysis

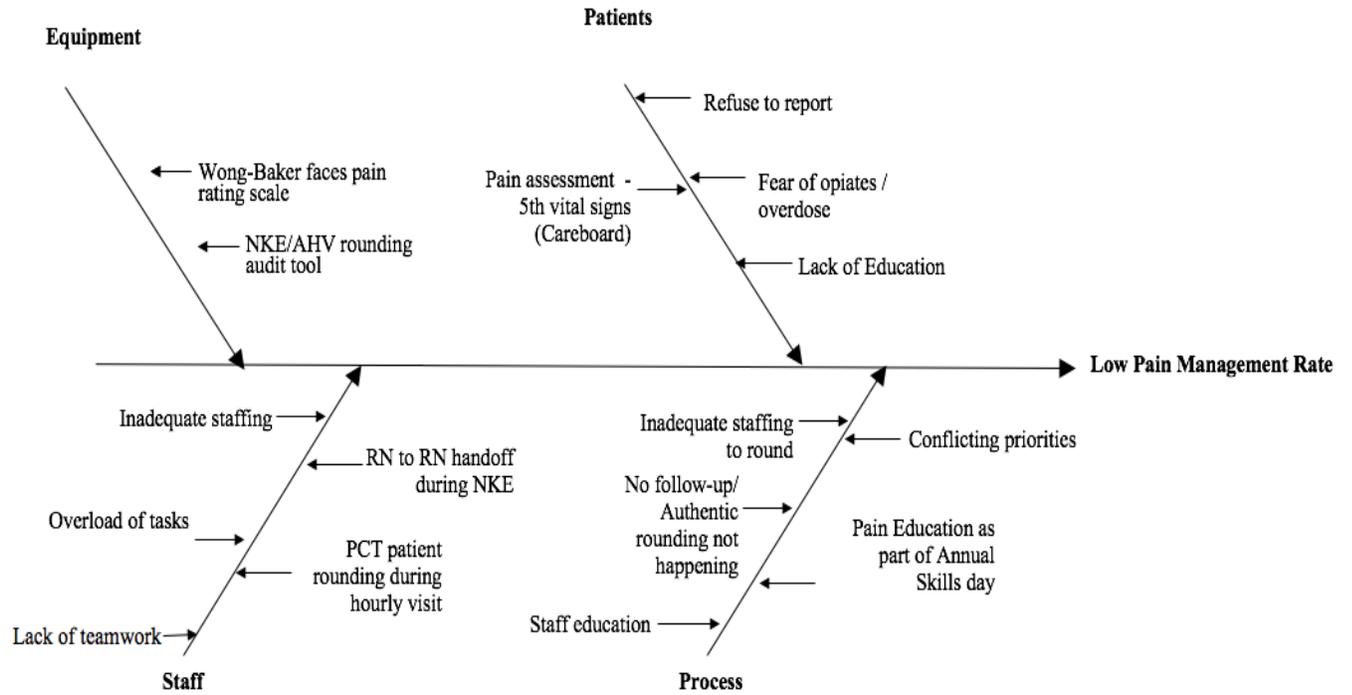| STRENGTHS AND OPPORTUNITIES	WEAKNESSES AND THREATS
By working on this process, we expect that pain is alleviated to a level of comfort acceptable to patients resulting in increased HCAPHS scores in patient satisfaction.	Resources in obtaining accurate, baseline pain data through rounding interview, chart review and HCAHPS survey.
Better pain management of cardiac catheterization patients will improve pain performance scores from a baseline of 2 to 3 via STAR rating system.	Staff attendance during huddle in bringing awareness regarding the effects of ineffective pain management and the repercussions of its complications, learning cues to nonverbal pain, and department's pain protocol.
Instituting standardized pain protocol will enhance pain screening, assessment, and intervention.	100% buy in of key stakeholders regarding the pain management of the department and agreement to strategies of pain control measures.
With improvements in pain management, it will expedite early mobilization after cardiac catheterization, thus reducing the length of hospital stay.	Further surveys and data collection need to be completed for more accuracy and effectiveness of methods.
By improving pain management, patient's hospital stay will be decreased thus saving money to allocate for other unit needs.	100% of patient participation in the pain treatment decision making during their hospitalization following cardiac procedure and at discharge.

Appendix I

Return of Investment (ROI)

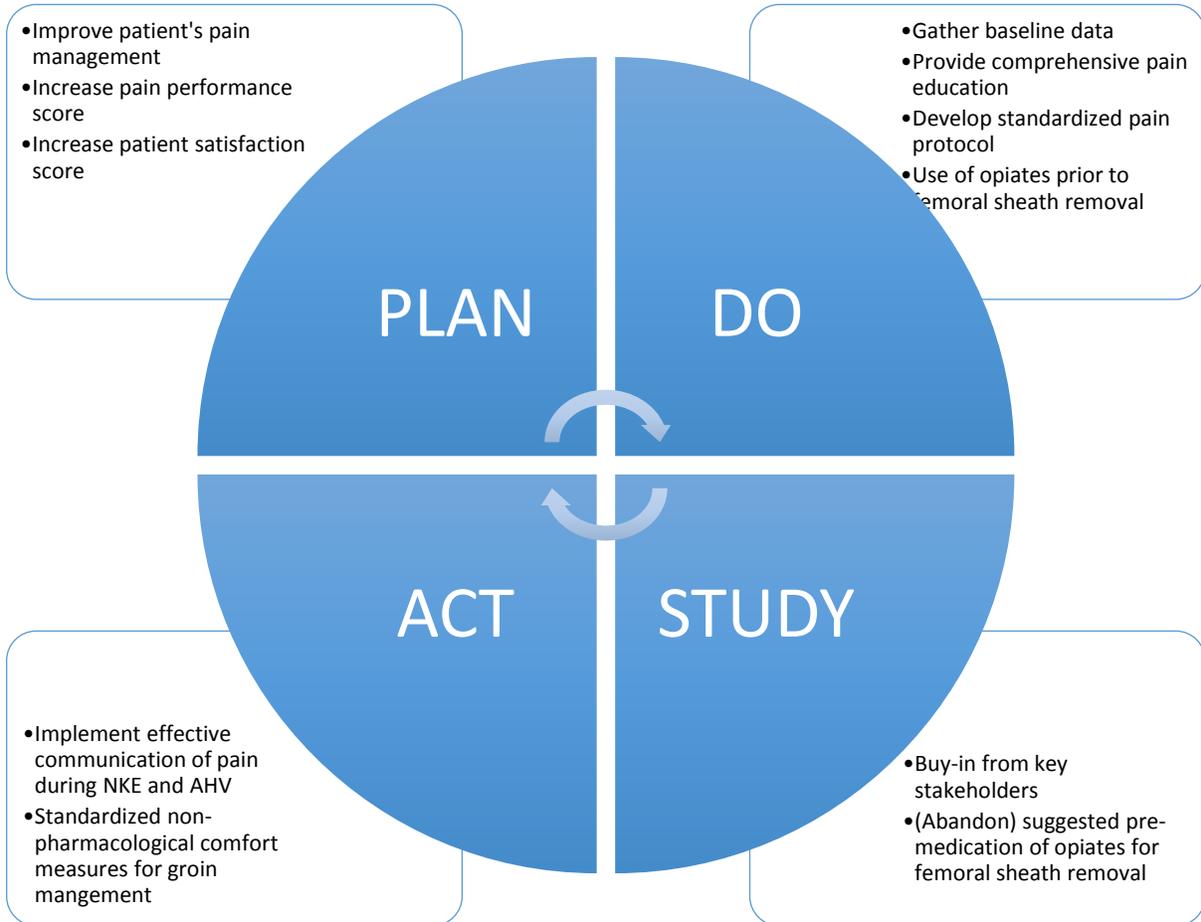| Description	Calculation per month	Calculation per year
Decrease patient length of stay (LOS).	Expected number of days decrease in a month = 1 day.	Expected number of days decrease in year = 12 days.
Improvement cost	Cost of staff education and training: No. of staff x time x rate per hour. 40 x 2 hours x $60.00 = $ 4,800.00	Cost of staff education and training in a year: $ 4,800.00 x 1 = $4,800.00
	Cost for handout material: $600.00	Total cost for handout material: $600.00
	Initial 2-hour inservice = $4,800.00	Total annual cost: ($4,800.00 + $600.00 = $5,400.00)
Calculated revenue (saving per day LOS: $3,500)	Saving per day reduction on LOS: $3,500.00	Total revenue: No. of day reduced LOS in a year x cost per day (12 x $3,500.00 = $42,000.00)
Calculated Return of Investment (ROI)		Total revenue – Total cost: $42,000 – $5,400 = $36,600
		Annual Saving of $36,600.00

Appendix J

Root Cause Analysis – Fishbone Diagram

Appendix K

PDSA Cycle

PLAN
- Improve patient's pain management
- Increase pain performance score
- Increase patient satisfaction score

DO
- Gather baseline data
- Provide comprehensive pain education
- Develop standardized pain protocol
- Use of opiates prior to femoral sheath removal

ACT
- Implement effective communication of pain during NKE and AHV
- Standardized non-pharmacological comfort measures for groin mangement

STUDY
- Buy-in from key stakeholders
- (Abandon) suggested pre-medication of opiates for femoral sheath removal

Appendix L

Tools Developed

Pain Control Survey for RN Staff

1. How often do you feel that a patient under your care has inadequate pain control?

    a. Almost every shift

    b. 1-2 x per shift

    c. Rarely

2. Please circle the top two factors that are major contributors when pain control is suboptimal.

    a. Pharmacy is too slow with meds

    b. Patient has unrealistic expectations

    c. Unable to reach MD to discuss pain control despite attempts

    d. MD spoken to but unwilling to change orders when asked

    e. RN too busy with other patient care tasks to reassess patient

    f. RN afraid of serious side effects such as respiratory depression and altered mental status

3. What is your usual next step when standard orders for PRN oral opiates (Norco, Percocet) do not control the patient's pain? May circle 2

    a. Give whatever IV med is available on the MAR

    b. Call MD to change oral med or increase the frequency

    c. Non-pharmacologic approach: Heat/ice, repositioning, distraction, emotional support

    d. Encourage patient to wait until the next scheduled medication is due

4. Which of the following would most help you control your patient's pain?

    a. More options for meds on the MAR

    b. Multidisciplinary rounding with the MD to discuss pain control

    c. Written information for the patient about duration of meds and what to expect

    d. Quicker response from the pharmacy

    e. More support from other RNs or Nurse managers to help with giving meds faster

    f. Education for you about risks, benefits, and side effects of pain meds.

5. Any other suggestions for what would help you?