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### Measuring Nurse Satisfaction with the Chest Pain Protocol

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MEASURING NURSE SATISFACTION WITH THE CHEST PAIN PROTOCOL

by

Ashley D. St. Amand

A Major Paper Submitted in Partial Fulfillment

of the Requirements for the Degree of

Master of Science in Nursing

in

The School of Nursing

Rhode Island College

2016

## **Abstract**

Approximately 380,000 lives are claimed annually from coronary heart disease. Early identification and prompt action is crucial to preventing mortality. Nurses are the frontline defense to rapidly assessing and intervening to prevent further cardiac damage and alleviate chest pain symptoms. A local community hospital implemented a chest pain protocol for nurses to utilize on the Medical-Surgical units. The chest pain protocol outlines the use of specific medications, including Nitroglycerin sublingually and Morphine intravenously, as well as obtaining an EKG and notifying the provider. The purpose of this project was to measure satisfaction among registered nurses on medical-surgical units at a local community hospital, as it related to the chest pain protocol. A ten-question survey was developed by this author to determine the level of satisfaction among nurses using the newly implemented chest pain protocol. Fifty RNs were surveyed from eight different Medical-Surgical units throughout Kent Hospital. The surveys were deployed approximately 120 days' post protocol initiation. The surveys were available for completion for one week. Results revealed nurses were neither satisfied nor dissatisfied with the chest pain protocol. Nurses responded favorably that regular feedback regarding the chest pain protocol would have been beneficial to its overall success. Implications for practice were presented and recommendations for future research were identified and included modifying this protocol to be nurse driven and providing further education for nurses at the bedside.

*Keywords:* Chest pain protocol, coronary heart disease, change, nurse satisfaction.

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## Table of Contents

Background/Statement of the Problem .....	1
Literature Review .....	4
Theoretical Framework.....	19
Method.....	21
Results .....	27
Summary and Conclusions .....	28
Recommendations and Implications for Advanced Nursing Practice .....	32
References .....	38
Appendices .....	43

## Measuring Nurse Satisfaction with the Chest Pain Protocol

### **Background/Statement of the Problem**

Heart disease is the leading cause of death for men and women in the United States. Heart disease claims the lives of about 600,000 people each year. Of those 600,000 lives, 380,000 are lost from those who suffer from coronary artery disease (CAD). The cost of CAD, in the United States alone, was estimated to cost an astronomical 108.9 billion dollars per year for treatment, which includes medications, health related services and lost productivity. The immediate identification and treatment of a coronary event could mean the difference between life and death. More than half (53%) of sudden cardiac deaths occur inside a hospital or healthcare facility. Nurses remain the front line to rapid assessment and intervention to prevent further damage of this delicate, but extraordinary vital organ (Centers for Disease Prevention and Control, [CDC], 2014).

Patients admitted to medical-surgical units typically do not have an admitting diagnosis of chest pain. Due to increased physiologic stress placed on the body during a hospitalization, some patients may experience an episode of acute chest pain during their stay. When a patient suffers chest pain, it is critically important to physically assess the location, description and intensity of the pain on a timely basis. Therefore, it is imperative to assess and treat acute chest pain on medical-surgical units within a health care facility promptly and efficiently. Time is muscle. According to Antman (2008), evidence has emerged which focuses on a door-to-balloon time of less than 90 minutes to improve patient outcomes. Door-to-balloon refers to the time it takes from the moment a patient enters through the door of the hospital to the time a balloon is inflated in their coronary arteries to restore circulation. The American Heart Association has created a mission lifeline, which integrates improvements in the health care system including emergency medical services (EMS) and improving readiness of appropriate treatment facilities.

Overall job satisfaction reflects a positive emotional bond toward work accomplished and the organization for which one works. Job dissatisfaction, however, reflects a negative connection towards an organization. Nurse satisfaction has been linked to positive results when teamwork was evident among the nurses. Nursing is a multifaceted profession and can be mentally and physically taxing. Nurses need to be astute with their thorough assessments of patients to develop a baseline, as well as to anticipate possible adverse events. The workplace culture is one of the biggest components of employee commitment and participation. Employees, who are dedicated and satisfied, improved their practice and patient care. The overall workplace culture is difficult to change. Factors that affect staff satisfaction included decision making, work place environment, teamwork, level of autonomy, time allocated for patient care, physician appreciation, nursing management, hospital leadership and career development opportunities (Gountas, Gountas, Soutar & Mavondo, 2013).

It is important to determine if nurses were satisfied with their current practice and the changes that have occurred within their practice. In the acute care setting, change is very common occurrence. Nurses are educated to assess for even the slightest change in a patient's baseline and then to critically think how the change impacts care and outcomes. Change can also be a personal challenge as well. Most people prefer consistency and status quo. When unexpected change occurs, people tend to become apprehensive and concerned, which can cause dissatisfaction. Collaboration, advocacy, research and education are the foundation of the care nurses provide. Nurses have been taught to think critically and logically while understanding exactly how and why certain interventions have occurred. Therefore, nurses are qualified to adhere to a developed protocol to alleviate an experience of acute chest pain for a patient on a medical-surgical unit. The purpose of this project was to measure satisfaction among registered nurses on medical-surgical units at a local community hospital, as it relates to the implementation of the chest pain protocol.



## **Literature Review**

Databases were utilized to investigate the current research and literature pertaining to acute chest pain and chest pain protocols included Medline, PubMed and Cumulative Index to Nursing and Allied Health Literature (CINAHL). Keywords used to research current literature included acute chest pain, change, nurse driven protocols, nurse satisfaction, empowerment, coronary heart disease, angina and myocardial infarction. The literature reviews ultimately comprised the following four main components; Coronary Heart Disease, Management and Treatment of Chest Pain, Nurse Driven Protocols, change and nurse satisfaction.

### **Coronary Heart Disease**

Coronary Heart Disease kills nearly 380,000 people annually and costs the United States close to \$109 billion dollars each year (CDC, 2014). Atherosclerotic cardiovascular diseases are a leading cause of death worldwide. Performing accurate and thorough assessments was key to determine those at risk for myocardial ischemia, to delay treatment and prevent death (Yin, et al., 2014). Early detection of an impending heart attack is key to survival. Heart attacks have several warning signs including chest pain, shortness of breath, cold sweats, nausea, and discomfort in the arms, shoulder or jaw. Cardiovascular disease varies in many ways, depending on gender, race, genetic profile and dietary habits. Approximately one-third of the disparity in life-years lost between blacks and whites is due to cardiovascular disease. Alaska Natives and American Indians experience twice the rate of cardiovascular disease and premature death related to cardiovascular events as compared to the overall population. Over the past three decades, disparities in cardiovascular health among minorities have also increased in the United States. These inequalities are rooted in social structure, unbalanced distribution of goods, power and resources among the American people (Jones, Fraley, & Hayman, 2015).

### **Management and Treatment of chest pain**

The management of chest pain is a common and challenging clinical problem. Providers are responsible to make decisions regarding life-threatening illnesses and provide urgent management for those with acute coronary syndrome (Kontos, Diercks & Kirk, 2010). The approach requires a multidisciplinary team, including physicians, PAs, nurse practitioners, nurses, pharmacists, therapists, dieticians, as well as the patient's own support system. A main component of providing patient centered care is the ability to communicate effectively among the multidisciplinary team. The communication allows for equal and adequate input from all, while maintaining the primary focus of improving the health of an individual. Communication is a frequent barrier to providing care to an individual. There is a growing need to strengthen nurse-physician collaboration to optimize health care to an individual. There is also a need for healthcare organizations to include nurses as healthcare professionals. The collaboration improves trust between the patient and their families and the nurse. Collaboration among the healthcare team also increases nurses' self-esteem, strengthens confidence in providing education to the patient and gives the nurses motivation to improve patient results (Courtenay & Carey, 2008). A qualitative study was conducted and included 26 nurses during 2006-2007. Results concluded the need for good inter-professional collaboration among physicians, nurses and other disciplines of the healthcare team that supported nurse protocols focused on addressing and treating pain (Stenner & Courtenay, 2008).

Nurses have the exclusive position of being at the bedside to identify clinical changes on the units in which they work. Bedside nurses are at the frontline of care and they hold the knowledge of the changes that need to occur to improve that care. Hyden & Fields, (2010) developed a pathway labeled "Rapid Rule Out" to rule-out acute myocardial infarction and improve efficacy in the care of patients with low risk chest pain. The pathway encompassed a corresponding order set, which included serial troponin sets as well as an electrocardiogram. Subsequently, a nuclear medicine or exercise stress test is scheduled within two hours of the second negative troponin. After

the third cardiac enzyme had resulted, discharge eligibility would be determined for the patient. Outcomes measured included wait times for diagnostic testing, turnaround time for results and length of stay. Results revealed a six-hour decrease in the length of stay for the patients on the observation unit utilizing the Rapid Rule Out pathway, which, in turn, decreased cost.

Myocardial infarctions (MI) can be misdiagnosed for a number of reasons including misinterpretation of electrocardiography, which occurs in 23-40% of cases (Kontos, Diercks & Kirk, 2010). Creating continuity among providers was imperative to standardize the evaluation process to recognize patients who appear to be low risk of a MI, but who actually had acute coronary syndrome (ACS). According to the American Heart Association guidelines, all patients with suspected ACS should undergo an electrocardiogram (ECG) and cardiac biomarker testing. The working goal of initial evaluation has changed from diagnosis to risk stratification. The initial evaluation should include a comprehensive history and physical as well as an ECG. ECG is the single most important tool for risk stratification. Current recommendations indicate that an ECG be performed within 10 minutes of presentation of chest pain and should be considered a “vital sign” when assessing a patient with chest pain (Kontos, Diercks & Kirk, 2010). Presence of ST segment elevation should prompt immediate attention to begin reperfusion therapy. Continued assessments of ECG’s should be performed every fifteen to thirty minutes if symptoms persist. A complete patient history should be obtained to determine whether they are high or low risk for ACS.

Most patients complain of chest discomfort as opposed to chest pain. Questioning of the chest discomfort should focus on the quality, location, onset, severity and any radiating or alleviating factors as well as any associated symptoms such as nausea, vomiting, diaphoresis or shortness of breath. (Kontos, Diercks & Kirk).

One study looked at a new clinical risk score, called the Florence Prediction Score to assess the cardiovascular risk in patients with chest pain without known coronary

disease (Conti, Vanni, Del Taglia, Paladini, Magazzini, Grifoni, Nozzoli & Gensini, et al,2010). The clinical prediction score utilized five independent variables: chest pain scores higher than six, male gender, age greater than 50 years, metabolic syndromes (hypertension, hyperlipidemia, obesity and smoking) and diabetes. Chest pain score was determined using location of the chest pain, radiation, character, associated symptoms and previous history of chest pain. Substernal and precordial pain scored +3 as opposed to left chest, neck, epigastrium and lower jaw pain which was scored at +1. Radiation to either arm, shoulder, neck, back or lower jaw was also scored at +1. The character of the chest pain, described as crushing, pressing, heaviness, scored 3+, versus sticking, pleuritic, pinprick +1score. Associated symptoms, such as dyspnea, diaphoresis and nausea scored at +2 and previous history of chest pain scored a +3. Using the clinical risk score appropriately, was shown to be an accurate assessment and useful method to proper decision-making and identifying possible implications (Conti, et al., 2010).

Treatment for acute chest pain in the emergency department incorporates the use of nitroglycerin, aspirin and morphine. Some treatment protocols also utilized beta blockers in suspected ACS. Beta blockers are used to reduce cardiac workload by minimizing the difference between myocardial oxygen demand and compromised oxygen supply from coronary artery disease. The use of beta blockers for acute coronary syndromes had been encouraged by both the CMS as well as the American Heart Association. The use of beta blockers had been linked to long term mortality benefits, including reduced re-infarction rates, arrhythmias, left ventricular remodeling and post infarction angina (Brandler, Paladino & Sinert, 2010).

### **Chest Pain Protocols**

Clinical protocols were first utilized in the 1990's for the management of acute coronary syndromes to successfully treat patients with acute chest pain. Although protocols provided a meaningful guide for physicians and nurses alike, care needed to be modified to meet the individual needs of the patient. Effective protocols defined

standards of care, improved efficiency and enhanced quality of care provided. Creating a protocol to treat acute coronary syndrome required a multidisciplinary approach with equal input from physicians, nursing staff, cardiologists, administrators, laboratory personnel and pharmacists (Wessler, Stant, Duru, Rabbani & Kirtane, 2015). The early diagnosis and risk stratification of ST-elevation myocardial infarction (STEMI), non ST-elevation myocardial infarction (NSTEMI) and unstable angina were crucial to determine a plan of action, including guiding therapy and ultimately improved patient outcomes (Scruth, Worrall-Carter, Cheng, Rolley & Page, 2012). According to the research, a protocol had yet to be developed for acute chest pain on medical-surgical units. Nurses are the frontline of care and the need for rapid accurate assessment and thorough appropriate intervention did not differ from that of an emergency department (ED) registered nurse. Many tools were utilized in the ED for assessing cardiovascular risk. In the United States, the assessment tools utilized included the Thrombolysis in Myocardial Infarction (TIMI) score and the Controlled Abcixmab and Device Investigation to Lower Late Angioplasty Complications (CADILLAC) score. The research also incorporated the GRACE (Global Registry for Acute Coronary Events) score in comparison to PAMI (Primary Angioplasty in Myocardial Infarction) score. The GRACE score incorporated the following predictors as part of the GRACE score calculator: heart rate, systolic blood pressure, serum creatinine levels, and congestive heart failure. The results assessed whether the scores of these different tools were valid in predicting future events. The CADILLAC, TIMI and PAMI risk scores accomplished valid prediction of re-infarction at 30 days, with the accuracy of risk scores ranging from 0.6-0.7, where the GRACE score had a low accuracy of 0.47. The GRACE score did not accurately predict mortality (Scruth, et al., 2012).

According to Meller, et al., 2015, the TIMI score and collection of the cardiac troponin marker T at presentation and at the two-hour interval, while using the accelerated diagnostic protocol, allowed early detection of more than one-third acute

chest pain patients to be at low risk for major adverse cardiac events. Early detection or “ruled-out” allowed for outpatient management and substantial cost savings. In comparison, a different study utilized a one-hour algorithm using the highly sensitive cardiac troponin T, which measured rule-out and rule-in of a myocardial infarction. The rapid assessment of incorporating the highly sensitive troponin T at baseline and within an hour enhanced the management of a suspected acute MI, as well as safely ruled-out in 75% of the patients (Reichlin, et al., 2015).

Guidelines advocated for the administration of fibrinolytic therapy within thirty minutes of chest pain onset in patients who are eligible for reperfusion therapy (Scruth et al.). One study evaluated 504 patients between admission and follow up outpatient care for a total of 38 months which resulted in 14% cumulative death rate within 12 months, 19% death rate within 24 months and 24% within three years. The analysis of the data concluded a GRACE score ( $P < 0.0001$ ) calculated in the ED, could powerfully predict outcomes in terms of follow up care, length of stay, likelihood of cardiac catheterization or even death from myocardial infarction (McLean, Phillips, Carruthers, & Fox, 2010).

A multicenter, double blind study utilized ticagrelor vs. clopidogrel for prevention of cardiovascular events in over 18,000 patients admitted with acute coronary syndrome (STEMI & NSTEMI). In patients who experienced acute coronary syndrome, with or without ST segment elevation, the use of antiplatelet medication was a key component. Wallentin, et al., (2009) explained that treatment with ticagrelor as opposed to clopidogrel considerably decreased the death rate from vascular causes, stroke or myocardial infarction, without an increase in overall major bleeding.

Nurses assessing patients with acute chest pain play an important role in the diagnostic process and thus make the process more efficient and cost effective. Nurses also had the unique position to apply evidenced based practice guidelines and standards to guide practice (McLean, Phillips, Carruthers & Fox). Treatment strategies included pain relief and preventing muscle death, which included pharmacologic interventions and

possible coronary revascularization. Utilizing two antiplatelet agents, aspirin and clopidogrel, for patients with a diagnosed NSTEMI, showed a 34% risk reduction of death from cardiovascular causes from 24 hours to 12 months. (Sen, McNab & Burdess, 2009).

Evidenced based practice was utilized to generate improved outcomes for patients. Kamba, Flynn & Raczkowski (2014) explained that the goal of treatment was to rapidly rule out STEMI in patients who exhibited signs and symptoms of cardiac ischemia as well as to develop an evidence-based approach to improved patient outcomes. The researchers noted that the median time decreased from 214 minutes to 74 minutes from ECG to dilation of the coronary arteries. The research utilized the chest pain alert program (CPAP), which centered on an interdisciplinary approach, where nurses are the front line responders for accurate and immediate assessment of chest pain (Kamba, et al., 2014).

Underwood, et al. (2009) used a quality improvement project titled RACE to activate the STEMI team and increase the rate and pace of coronary reperfusion through changes in the emergency department. The changes included triage of immediate nurse-patient encounter and notifying the physician of a possible STEMI patient. Having a dedicated space specifically for the ECG machine, allowed for appropriate and accurate cross training, to incorporate as many staff as possible. After completed, the ECG was given immediately to the physician for interpretation and action. The use of a specific code STEMI was then used as a time saving strategy. Code STEMI was utilized as an order set, including EMS leaving the patient on the stretcher for easy transfer for percutaneous coronary intervention (PCI).

Asher, et al. (2015) compared patients who presented with acute chest pain using the accelerated diagnostic protocol versus routine care in the internal medicine department. The study included 585 patients who presented with acute chest pain, at a consecutive low to moderate risk, where 304 of the included patients were treated in the

chest pain center with the use of the accelerated diagnostic protocol and the remaining 281 patients were placed on the internal medicine floor. Overall, the study found that the accelerated diagnostic protocol had a lower incidence of readmissions and acute coronary syndromes during the follow up period. The study also proved that the protocol used was clinically superior and cost effective in treatment of patients experiencing acute chest pain and may save resources and time for the providers utilizing it.

Chest pain protocols have been developed for registered nurses in emergency departments to make effective and life-saving decisions about care of patients who presented with acute chest pain. The protocols included rapid assessment of chest pain, obtaining a detailed history, physical examination of vital signs and initiating intravenous (IV) access, obtaining blood draws for lab testing, including CBC, Chem 7, PT/PTT, CK, CK-MB and Troponin immediately essential. In addition, an ECG with interpretation within 10 minutes of onset of chest pain and having the attending interpret the ECG immediately was essential. The next step was to assess Oxygen need, to maintain saturation above 93%. Oxygen therapy had been used in the treatment modality of acute chest pain for over a century due to the belief that increasing the amount of oxygen a patient received would potentially increase the amount of oxygen to the myocardium. Guidelines established by the National Institutes of Health included the non-routine use of high flow oxygen, with importance on monitoring of the oxygen saturation instead. Potential harms of high flow oxygen included a drop in cardiac output, decreased heart rate and left ventricular perfusion, and a rise in systemic vascular resistance (Lagan, J., Garg, P, Tang, MF. & Burgess, M., 2013). Medication administration included Aspirin 325mg by mouth unless contraindicated (Protocol-ED, 2013). One protocol, titled Cardiovascular system protocol differed slightly from the others with notifying the physician immediately, positioning of the patient for maximum comfort, administering oxygen two to six liters nasal cannula to maintain saturation >92%, obtaining an ECG, administration of chewable aspirin 325mg unless contraindicated, administration of

nitroglycerin 0.4mg sublingually (may repeat every five minutes times three if tolerated) start large bore intravenous (IV) access with 0.9% normal saline at keep vein open rate and monitoring vital signs and cardiac rhythm every five minutes (Cardiovascular System, 2011). The Cardiac Care Network developed the ACS decision tree, which incorporated many of the same treatment options and required an immediate assessment and management of symptoms within ten minutes. The ACS decision tree was a direct nine step process which included obtaining vital signs and oxygen saturation, applying oxygen as needed, performing a brief history and physical for possible fibrinolytic therapy, obtaining a 12-lead ECG, placing a patient on a continuous cardiac monitor, administering aspirin 325mg, nitroglycerin 0.4mg sublingually if not contraindicated, Morphine IV if pain not relieved by nitro and placing two peripheral IV's (Kingsbury, 2013). Protocols have been shown to be effective in specific nurse sensitive outcomes, such as catheter associated urinary tract infection (CAUTI), but little research has been completed on the effectiveness of utilizing a protocol for chest pain. In order to successfully implement a clinical protocol, post-implementation data collection and adequate monitoring must be assessed to evaluate the outcomes (Wessler, et al, 2015).

### **Change**

Reactions to change are influenced by a variety of factors. Change can be challenging, because it involves going from the known to the unknown. Three common factors were identified as influencing employees' reactions to change: communication, individual employee emotions and cognitions and their participation in decision-making. These factors become arguably more evident during change within an organization (Wittig, 2012).

Individuals working together tend to have a variation of personality traits. A framework had been utilized for the past two decades, which was known as the Five-Factor Model of Personality (Vakola, Tsaousis & Nikolaou, 2004).

These five-factors were labeled;

1. Neuroticism: the tendency to experience negative affect, such as insecurity, anxiety and distress
2. Extraversion: identified as the quantity and intensity of interactions of interpersonal relationships and activity level
3. Openness to experience was proactively seeking new happenings
4. Agreeableness was the interpersonal capability along the continuum from compassion to antagonism
5. Conscientiousness: the motivation and persistence in goal directed behaviors (Vakola, Tsaousis & Nikolaou, 2004).

Decreased work performance and higher turnover rates could be attributed to the low morale and motivation that accompanied the level of stress encountered. The three most common categories of stress definitions were stimulus based, response-based and stressor-strain approach. The first type, stimulus based, considered that stress impinges on an individual from a situational or environmental stimulus. The second type, response-based, defined the stress as the individuals physiological or psychological response to situational/environmental factors. Thirdly, the stressor-strain approach combined the above definitions, further more defining stress as both a stimulus and a response (Vakola & Nikolaou, 2005). Many studies have determined that organizational change can be a very stressful event for individuals. People experiencing change encountered several emotional states, including equilibrium, anger, denial, chaos, bargaining, readiness, openness and re-emergence. Resistance to change was the number one reason organizational change fails (Vakola & Nikolaou).

Nurses present to the table with unique skills, expectations and needs in a healthy work environment to fully utilize their professional skills. When organizations could provide a positive and supportive atmosphere, employees were more likely to be committed to their work. Employees needed to feel adequately informed and trained with

special skills especially during change, because effectively communicating the change that occurred, decreased fear and ambiguity. Participation in change programs should be included in employees' performance evaluation (Vakola & Nikolaou).

### **Nurse Satisfaction**

Job satisfaction could generally be defined as the attitude of how one felt about their job, and in particular, the degree to which they felt gratified (Caricati, et al, 2014). Nursing is a highly involved profession focused on serving others. Providing appropriate customer service is essential in every occupation, but in the nursing profession, the satisfaction was based on how well one cares for another and if the care was appropriate and effective. Credence services are provided by the nursing profession and are described by the consumer as difficult to evaluate prior to and after the experience. The difficulty in evaluating the service in the health care industry was usually due to the consumer's lack of knowledge and understanding of how the industry works (Gountas, Gountas, Soutar, & Mavondo, 2013).

Many studies have found that job satisfaction increased job performance. The known attributes of job satisfaction were individualized, but overall well-being and happiness may have had a greater direct impact on job performance as opposed to satisfaction. Job satisfaction and performance were affected by the emotional environment in which they practiced and often times they needed to either express or overpower the need to show emotion, which had a direct impact on the care they provided (Gountas, Gountas, Soutar, & Mavondo).

Many studies had shown that workplace conditions could have negative consequences, such as increased stress and decreased satisfaction. In certain situations, individuals gained satisfaction from improving the emotional well-being of others and accepting the gratitude for their work efforts. The relationship between job satisfaction,

self-efficacy and performance outcomes was also encompassed in the workplace conditions. Increased self-efficacy appeared to have direct implications on increased employees' effort and subsequently, their job performance (Brunges & Foley-Brinza, 2014). A set of emotions and feelings about an individual's job was known as job satisfaction. Satisfaction incorporated the person's cognitive and affective evaluation of their job, including the conditions of their job and how they were perceived. Job satisfaction in nursing appeared to be associated with providing appropriate and adequate care, while maintaining a solid work ethic. Factors that impacted the consequences of emotional labor and exhaustion impacted the level of nurses' job and life satisfaction (Gountas, et al., 2013).

Another important factor to consider when predicting job satisfaction was the professional commitment one has. Professional commitment was defined as the extent to which workers felt involved in and tied to their profession (Caricati, et al., 2014). Commitment had been linked to one of the important factors when determining one's work behavior. Individuals with higher levels of commitment to their profession were more likely to engage in activities that favor the organization where they were employed (Caricati, et al).

RNs' job satisfaction and retention were major trepidations for nursing administration, especially as the demand for RNs continued to surpass the quantity. As overall job satisfaction decreased among RN's, the likelihood of nurses leaving their employment increased. One important predictor of RN job satisfaction is the Professional Practice Model. The model was characterized by a greater presence of the RN with the patient. The major concepts of the professional practice model focused on collaboration, respect, care, professional development and family centered care. With the use of this model, nurses felt that they had the exclusive opportunity of providing input towards a foundation to professional practice (Newcomb, Smith & Webb, 2009). Nurses at the bedside allowed for more preventative monitoring to occur, as well as flexibility

and greater decision-making authority for the RN. In addition, it lead to resolving actions that were suitable and efficient. The importance of the model provided a structural framework for RN's to increase dedicated practice. The model included many defining characteristics, such as autonomy, positive nurse-physician relationships and shared governance (McGlynn, Griffin, Donahue, & Fitzpatrick, 2012).

Workplace culture was often embedded, and therefore, made the change difficult. Changing the overall culture of a workplace environment required leaders with vision and the appropriate tools to engage personnel to embrace a positive change for a healthier and more productive workplace. In order to change the culture of a workplace environment, one must first develop an understanding of the current culture and outline a vision for the change (Brunges & Foley-Brinza, 2014).

## **Theoretical Framework**

The theoretical framework fitting for the project was Perkins and Zimmerman's Empowerment Theory (1995). Empowerment could be defined as "a construct that links individual strengths and competencies, natural helping systems, and proactive behaviors to social policy and social change" (Perkins & Zimmerman, pg. 569). The change, with regards to social policy, links an individual's well-being with the larger social community and political environment. Empowerment compels the individual to compare and contrast in terms of health versus illness, strengths versus weaknesses, and competence versus deficits. Specific interventions that were aimed solely at empowerment, enhanced wellness while aiming to improve problems. The empowered-oriented interventions also allowed participants the opportunities to develop skills and acquire knowledge.

Theories of empowerment incorporated both processes and outcomes. The processes and outcomes suggested that actions and activities may be empowering and that the outcomes of the processes resulted in feeling empowered. There was not a single standard that could measure the meaning, with regards to context; therefore, processes and outcomes differed in their outward form. Empowered processes included individual participation in community organizations and collective decision making at the organizational level. Empowered outcomes differed, in that it allowed situation-specific perceived control and mobilization of adequate resources and skills (Perkins & Zimmerman, 1995)

Applying the general framework of the empowerment theory suggested that individuals would participate with others to achieve set goals, obtain access for adequate resources and show evidence of critical knowledge of the basic principles of sociopolitical environment. Empowerment at the organizational level provided a generalized framework to enhance member participation and improve goal achievement. At the community level, the empowerment theory and framework supported

improvement of quality of life in a community and provided stronger community connections (Perkins & Zimmerman, 1995).

The theory of empowerment could be applied to the RN's utilizing the chest pain protocol as it focused on aiming to improve problems and enhancing wellness. Empowering nurses allowed for an autonomous connection, self-determination and a sense of authority. The chest pain protocol was designed to provide specific interventions for the RN's to use for the patient experiencing acute chest pain. The RN's who utilized the protocol would feel inspired to treat acute chest pain by obeying the actions prescribed in a timely fashion and ultimately improving the quality of life for the patients they are caring for. Empowerment could also be applied to the RN's who completed the project survey. Allowing the RN's, the power to provide valuable feedback about a protocol being used and possibly establish changes in future outcomes was significant.

There were three questions within the survey tool that truly focused on empowerment of the nurses. The questions focused on communication, meeting the needs of the nurses, and the ability to utilize the protocol within their regular workloads. The questions were aimed at determining whether nurses felt autonomous while utilizing the protocol.

## **Method**

### **Purpose**

The purpose of this project was to measure satisfaction among registered nurses on medical-surgical units at a local community hospital, as it related to the chest pain protocol. A survey tool was developed specifically for use within this project, with the main focus on evaluating nurses' level of satisfaction. The survey was distributed approximately 120 days' post implementation of the chest pain protocol.

### **Site**

The site utilized for the survey was Kent Hospital. The hospital housed eight medical-surgical units, all of which had satellite telemetry. The multiple medical-surgical units had a variety of available beds, ranging from 10 to 35. The medical and nursing leadership of a local community teaching hospital, the second largest single site facility in the State of Rhode Island (359 beds), decided to incorporate a chest pain protocol for patients on medical-surgical units experiencing acute chest pain. The protocol began on December 1, 2015. The previous policies and procedures dictated that the nurse contact the house officer, who is a physicians' assistant (PA) via pager, explain the acute distress of the patient and await orders for treatment. The response times were 10-15 minutes, or longer, depending on the time of day the acute chest pain occurred and which house officer was on call. With the new protocol in place, it served to be a more efficient manner by which the nurse would implement the protocol for acute chest pain. The PA or physician would then follow-up after the protocol was initiated for evaluation or resolution of chest pain or to determine if the patient required a transfer to a cardiac level of care. Like any new protocol initiated, it was important to determine if nurses were satisfied with its current process, or if modifications needed to occur to improve patient outcomes. RNs who primarily worked on medical-surgical units, were the target audience for a post-implementation evaluation.

### **Sample**

The sample included 50 RN's working on medical-surgical units in a local community hospital. The RN's potentially surveyed were diverse in many ways, including educational background, years of experience, age, gender and specialty.

### **Procedures**

The chest pain protocol was rolled out December 1, 2015, throughout the entire hospital. Beginning the first week of April 2016, flyers were placed in all of the nursing lounges throughout the hospital, providing information that the survey would begin April 4, 2016. An informational letter accompanied every survey, explaining that participation in the survey was completely voluntary and that all responses remained anonymous. A quantitative design was utilized for the survey. The survey labeled "Measuring Nurse Satisfaction of the Chest Pain Protocol (Appendix A) was utilized for the project. The survey tool was developed by this author and contained ten (10) questions that primarily investigated the nurse satisfaction with the implementation of the chest pain protocol. The survey tool was then reviewed by the nursing administration at Kent Hospital and IRB approval was obtained.

The key variables in the design were the registered nurses on medical-surgical units caring for patients with acute chest pain. Inclusion criteria were any RN who worked on a medical-surgical unit or who were eligible to float to a medical-surgical unit. Exclusion criteria included any RN who primarily worked on the progressive care unit, critical care unit, psychiatric care unit, women's care unit or acute rehabilitation unit, as these were all identified as specialized units or had a chest pain protocol already in use. The chest pain protocol education seminar was mandatory for all RN's to attend; however, the satisfaction survey was not mandatory to complete. A flyer was placed above a large manila envelope containing the blank surveys, as well as an empty envelope to the right where the completed surveys were placed. The flyer instructed the RN's on where to place the completed survey as well as the deadline to complete the survey. The flyer also stressed the importance of maintaining anonymity. Participants

avoided writing their name on the survey. Surveys contained ten questions regarding implementation of the chest pain protocol as it pertained to whether or not RN's were satisfied with the protocol itself. The ten questions measured the level to which the RN agreed or disagreed with the statement provided using a five (5) point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Surveys were posted in the staff lounges for seven (7) days allowing adequate time for the RN's to complete. Surveys were collected every two days, so that no surveys remained in the envelope for an extended period of time. After the week had concluded, the flyers, and post surveys were removed and the data was analyzed. The data collected was inserted into the poster for presentation at the Masters Symposium on May 3, 2016.

### **Measurement**

The survey titled "Measuring Nurse Satisfaction of the Chest Pain Protocol" was utilized to collect the data. The surveys were scored using the Likert scale. Likert scales allowed respondents to indicate the degree to which they agreed or disagreed with each statement (Polit & Beck, 2012). The scale resulted in a score of 1-5 for each answered question and allowed the researcher quantifiable data for comparison. The survey questions were specified to determine the level of nurse satisfaction with use of the protocol calculating the mean statistical data of each question. The desired outcome of the survey was to determine the level of satisfaction among nurses utilizing the chest pain protocol. If nurses were not satisfied with a set protocol, they may have been reluctant in using the protocol in practice. Therefore, determining the level of satisfaction was necessary for overall achievement. Also, if nurses were dissatisfied with utilizing the protocol, it would be vital to supply that information to the nursing leadership, to make appropriate changes to the chest pain protocol in order to increase nurses' satisfaction. Educational seminars were given for nurses to attend, as well as direction as to how the chest pain protocol was to be utilized in practice. The chest pain protocol was ordered for any patient experiencing chest pain in the emergency department as an "as needed

order". If a patient experienced acute chest pain while admitted to the medical-surgical floors, and did not have the protocol ordered, a page was sent to the attending physician for the order to be placed for the individual patient.

### **Organizational factors**

Limitations that were considered included a lack of participation from RN's. Participating in the survey was completely voluntary. Due to the high demands of the RN's completing required educational in-services and computer based learning modules, nurses as a whole may have felt that participating in another survey was overbearing. Another factor to consider was an unpredictable census on each of the medical-surgical floors. The census on each unit fluctuated frequently, which meant that staffing and patient acuity was altered frequently. The chest pain protocol began on December 1, 2015. Approximately sixteen (16) weeks' post-protocol initiation, the surveys were completed. New England weather could be unpredictable, either excessive or deficient amounts of snow every winter. It was not uncommon to have excessive amounts of snow causing vigorous snow shoveling. Strenuous activity leads to an influx of emergency department visits of patients with acute chest pain.

IRB submission and exemption was obtained through Kent Hospital as well as Rhode Island College. Administrative support of the project and survey was required to prevent resistance and future barriers to the project. Resources were in great supply in order to prepare for the initiation of the protocol. Every medical-surgical unit in the hospital had an ECG machine as well as satellite telemetry. Barriers to participation were identified and included a lack of willing participants of RN's who were hesitant to put this protocol into practice in the first place.

### **Actual/Potential Ethical Concerns:**

The proposal was submitted to the IRB at Kent Hospital and Rhode Island College. Actual and potential ethical concerns in the satisfaction survey included autonomy of the registered nurses being able to initiate the protocol following the prescribed order set.

Beneficence was also an ethical concern as many of the registered nurses using the protocol felt that they are doing the best for their patients by activating the protocol and avoiding delay in treatment. Diversity also existed on each individual medical-surgical floor; from the ages of the RN's, to the years of the experience working as an RN, to the number of RN's employed on each unit, the number of available beds, and even the educational background.

### **Evaluation plan**

The project was evaluated by reviewing the survey completed at the 120-day post protocol initiation. Results of the survey were presented to nursing leadership, specifically related to the level of satisfaction experienced by the RN's. The information gathered from conducting the survey provided beneficial data for Kent Hospital to incorporate future project implementations. After reviewing the survey and collecting the data, a poster was created and displayed including the nurses' satisfaction among the nurses on medical-surgical units in the hospital cafeteria for general population viewing.

## Results

A survey was developed and distributed to the eight medical-surgical units throughout Kent Hospital. The developed survey incorporated ten questions that measured the level of satisfaction among nurses who utilized the chest pain protocol. A total of 50 surveys were collected and analyzed for averages. The individual questions and their corresponding mean values are listed in the table (Appendix B).

The surveys were measured using a five (5) point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Using a calculation of determining mean, the questions that exhibited the lowest mean score were questions 2 and 6. Question number two: the implementation of the Chest Pain Protocol was effectively communicated, had a mean score of 3.06, and on the survey, a score of 3 coincided with the answer neither agree nor disagree. Question number 6: There is adequate support and resources to utilize the Chest Pain Protocol, had the lowest mean score of all ten questions, 3.02.

In contrast, the highest average score of 4.2, where the score of 4 co-aligned with 'agree' was calculated for question number 8, nurses would benefit from regular feedback regarding the Chest Pain Protocol. In the table below, the results can be visualized using a clustered bar chart (Appendix C). The remaining seven (7) questions had mean averages in the three ranges, from 3.22 (question 5) to 3.84 (question 1). The final question, number 10, whether or not nurses were satisfied with the chest pain protocol, resulted in a mean score of 3.44, which translated to the nurses neither agreed nor disagreed with the chest pain protocol. The survey results were illustrated in a clustered column chart located in Appendix C.

## Summary and Conclusions

Heart disease remains one of the leading causes of death among men and women across the country. The immediate identification and treatment of a coronary event could mean the difference between life and death. Fifty-three percent of sudden cardiac deaths occurred inside a hospital or healthcare facility. Nurses remained the front line to rapid assessment and intervention to preventing further damage of this delicate, but extraordinary vital organ (CDC, 2014).

A new protocol was developed for RN's to utilize on the medical-surgical units specifically for patients experiencing acute chest pain, beginning in December 2015. Nurses had utilized this program for four (4) months and a survey was developed to determine whether or not they were satisfied with the new protocol.

As the data was analyzed, review of the individual surveys revealed vast differences in answers given. As the mean values were calculated, there were three (3) questions that truly contrasted from the rest. Question number 2 asked nurses if they thought the implementation of the chest pain protocol was effectively communicated, with a resultant mean score of 3.06. This determined that nurses neither agreed nor disagreed with that statement. Further review revealed a total of twelve (12) nurses answered 'disagree' and five (5) nurses answered 'strongly disagree', resulting in 34% of RN's felt the implementation was poorly communicated. Meanwhile, nineteen (19) nurses agreed that the implementation of this protocol was effectively communicated. The question with the lowest scored means was 3.02, number 6, which asked RN's if they felt there was adequate support and resources to utilize the chest pain protocol. Reviewing the individual results of the surveys, nineteen (19) nurses (38%), believed negatively about this question, answering either 'strongly disagree' or 'disagree', while eighteen (18) nurses (36%) determined that there were adequate resources and support to utilize the chest pain protocol in its entirety. Finally, the question that averaged the highest score among nurses was to determine if they would benefit from regular feedback

on the impact of the chest pain protocol, which scored a 4.20. Reviewing this question revealed that 43 out of the 50 nurses responded (86%), either agreed or strongly agreed that feedback would be beneficial to them. The overwhelming positive result of question eight, confirmed that the nurses' desire the feedback on whether they felt the utilization of the protocol was making an impact.

There were three limitations identified throughout the project. The first limitation was the small sample size. Unfortunately, only 50 nurses responded out of the roughly 200 RN's that work on the medical-surgical units throughout the hospital. The results only captured about 25% of the population, so it would be of interest to discover how the other 75% would have responded. The survey was not mandatory to complete, so many of the RN's chose not to participate. During the time of the survey, the mandatory education computer based learning modules were released for each member of the hospital staff to complete, so it is possible that nurses felt overwhelmed by having to complete another survey.

Another limitation was to determine if the chest pain protocol was actually being utilized. Although answers completed by the registered nurses were valuable, it would have been of interest as to whether or not there was use of the chest pain protocol in their individual practice

The questions on the survey tool were also very limiting. A qualitative open-ended survey may have been more useful with regards to researching the level of satisfaction among nurses.

The surveys were completed anonymously and lacked demographics. The additional demographics and variables would have provided educational level and years of experience for each of the RN participants. Identification of the work shift and limited access to additional staff could also be assessed.

Benner (2004) explained that good nursing practice requires development of skillful clinical judgment and ethical comportment by use of scientific evidence and

technological advances. Sciences of nursing and medicine are broad and require multidisciplinary approaches as well as transition into practice. Knowledge is required in the practice of nursing, and can only be captured by using procedural and scientific knowledge, which was designed as formal and certain. Nursing also combined the contrast of practical knowledge, which was one who learns from previous experiences to improve their practice. Benner's theory found that responding to a situation of a particular concern is the central idea of excellent practice. The skillful practitioner learned to use his or her knowledge as a background of the situation to recognize where expectations fall short. In emergency situations, nurses must be able to clearly articulate the reason for a standing order or protocol, which enables them to go beyond the usual boundaries of nursing practice. The practice of exceeding the boundaries is defensible and expected when a patient's life depends on it. Benner also explains that nurses who could recognize the unexpected should be considered operating at an expert level.

Finally, the most significant limitation of the chest pain protocol included the process of obtaining a medical order. When patients complain of acute chest pain while on the medical-surgical floors, and the patient doesn't have the protocol ordered, the RN will still have to contact the physician directly to obtain the order.

In conclusion, it was clear that nurses overall, felt that the implementation of the protocol was not effectively communicated and felt that they did not have adequate resources to utilize the protocol to its entirety. The information was given directly to the nursing administration for use when developing future projects.

### **Recommendations and Implications for Advanced Nursing Practice**

There are many implications that can be gathered from completion of this project that can impact the practice of advanced practice registered nurses as a whole. These implications affect many aspects of the healthcare system, including, practice and policy changes, research, education, leadership and development of evidenced based practice. An additional study could be conducted to determine the frequency in which the chest pain protocol orders were employed to really determine its usefulness. The overall usefulness of the protocol should actually be a nurse-driven protocol to minimize interruptions to the attending physician, and to have the autonomy to complete the order set from beginning to end. Further research could be utilized to determine how the implementation of the chest pain protocol could have been presented differently, including the educational component that was provided to the RN's.

There are recommendations to improve practice for the care of all patients experiencing acute chest pain and improving the overall satisfaction of the nurses caring for these patients. Communication appeared to be a significant component of the satisfaction among nurses on the medical-surgical units. Effective communication is required to remain a strong component between members of the healthcare team to improve the care provided. Communication is vital to establish, not only among the healthcare team but from the other aspects of the healthcare system, including the administration and education departments. Along with communication is collaboration. As a healthcare team, there should be a multi-disciplinary approach to providing patient centered care, including nurses, physicians, pharmacy, nutrition, physical and occupational therapists. These disciplines all provide important tools and knowledge to convey and deliver thorough and appropriate care for the acutely ill individual. Utilizing these invaluable resources is pivotal to delivering excellent care. Additional tasks and duties are continuously being added to the overwhelming workload of floor nurses, which overall appears to be impacting care. Recommendations also include utilizing the

education department, specifically the clinical nurse specialists, in collaboration with the nurses on the floor, to promote further education and identify the barriers to care that exist on these units.

The practice of accurately assessing, treating and caring for patients experiencing acute chest pain on medical-surgical units should be a uniform model adapted by all RN's at the bedside. If modifications were required to improve care of these patients, they should be addressed immediately. Further research investigations should focus on determining if the actual protocol is being followed completely or if pieces of the protocol are being omitted.

The simple survey tool that was utilized to measure nurse satisfaction with the chest pain protocol provided a quantitative approach to evaluating satisfaction. The survey tool utilized for measuring satisfaction was developed by this author and therefore lacks validity and reliability. Future studies could focus on measuring this tool for validity and reliability. Expanded measurements could have included qualitative data, to determine the aspects of the protocol that the nurses felt needed revisions. Advanced research efforts could also be employed to determine the demographics of the patients requiring the protocol. The actual time frame it takes from start to finish of treating a patient acutely for chest pain and how that time frame impacted the care of the other patients on a nurse's assignment. Another determination of how time is muscle is the response of the house officer to assess this acutely ill patient. Utilizing the updated protocol includes a varied response time amongst providers. The challenge of needing to be in multiple places throughout the hospital expands the need for increased staffing as well as improved technology to have real-time results in the chart as the patient experiences the pain. Simply stated, the impact of having the EKG uploaded directly into the electronic health record for viewing by the house officer when they physically cannot be present to read the results, may improve the care by determining if further interventions are necessary in the care of that patient.

Education and leadership are very important aspects of the success or failures of new innovative protocols. The nursing leadership determined the need for the chest pain protocol and collaborated with the education department to provide numerous four-hour classes for nurses on the medical-surgical units regarding the changes addressed in the protocol, including the care impacted for these patients. However, it appeared that the leadership never researched the current practices of treating acute chest pain on medical-surgical units and created an educational piece that entailed a small portion of the new changes. There was no planned follow-up for determining revisions or modifications within that protocol. Effectively creating educational activities would be extremely valuable to determine the needs of those caring for patients at the bedside. It would be of utmost importance for nursing leadership to shadow the events of a typical eight or twelve-hour shift of a floor nurse before determining if new policies should be exercised on the units. Having a concrete impression and understanding of how the floor operated and functioned on a daily and shift-basis, will ultimately improve the quality of the protocols developed for future educational programs.

Ethical considerations are also essential to incorporate as new policies and procedures are planted into practice. The ethical principal of beneficence encompassed the care provided for the patient who experienced acute chest pain. As nurses, it's our ethical diligence to do good. Autonomy, however, seems to miss the mark. The chest pain protocol will have to be ordered by a physician and further delay effectively treating those patients experiencing acute chest pain. Guidance for further policy change regarding the chest pain protocol would be to develop a nurse-driven protocol. Nurses should be allowed the autonomy to assess and determine the treatment measures necessary to effectively treat acute chest pain. Making the chest pain protocol nurse-driven would provide a multidisciplinary approach with collaboration from physicians, house officers, pharmacists and.

Acutely treating chest pain required the work of an interdisciplinary team with adequate skills and knowledge. The advanced practice registered nurse could provide many opportunities within this majestic team to strengthen the collaboration. Advanced practice nurses (APRNs) could perform a variety of roles, including clinical nurse specialists (CNSs) and nurse practitioner (NPs) to educate and case manage. The value of the knowledge and aptitude that the APRNs exhibit advances the role of nursing while providing safe, appropriate and cost effective care. Specifically, in the CNS role, the APRN could provide much needed education to the nurses at the bedside to augment their individual skills with treatment of acute chest pain, from obtaining an ECG to accurately documenting the severity and description of pain, to appropriately monitoring for minute changes in vital signs and administering medications properly. The APRN role also includes the NP role, who will be the clinician to respond to the call to assess the patient after the protocol has begun, interpret ECG results and determine if ischemia exists, as well as formulating the need for further interventions.

Diversity exists among every unit in the hospital. Initially, most medical-surgical units were designated as specialty floors; however, all of the units could take cardiac patients that were not requiring immediate intervention. Diversity also occurs among the patients, including age, gender, religion, race, ethnicity, cultural preferences, co-morbidities and socio-economic background. Diversity is important to remember when caring for patients as well as continually respecting their individual dignity and culture. As the APRN, it is important to respect an individual's culture and dignity, especially during an acute illness. APRNs understand that utilizing the proper resources around them, along with embracing diversity among the healthcare industry, is identifying the impact that emerging and innovative technologies have on our system.

Technology continues to evolve, especially in the healthcare system. Most hospitals have converted to using an electronic health record, which has allowed for connections among healthcare providers. Records can be utilized in the outpatient

setting, as well as the inpatient and community settings to provide comprehensive care and allow practitioners to communicate properly. Most RN's at the bedside are using work-stations on wheels or computers directly in the rooms of the patients. Technology today would allow for live documentation and immediate visible results to the multidisciplinary team. Nurses are also utilizing the automatic blood pressure machine and satellite telemetry. Nurses are able to page a provider directly from a computer application with a text page explaining what is going on with the patient. The provider can then directly place orders into the patient's chart that the nurse can review. The provider can also call the unit and the RN can take verbal orders. An improvement in technological advances would be the benefit of uploading the ECG directly into the computer for the house officer to visualize if they cannot be on the floor within ten minutes of onset of chest pain allowing for accurate assessments, thus preventing delays in care.

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## Appendix A

### ***Measuring Nurse Satisfaction of the Chest Pain Protocol***

**Now that the Chest pain protocol education has been completed and the protocol has gone live...**

For each of the following statements, please rate the strength of your agreement with the statement, from 1 (strongly disagree) to 5 (strongly agree).

	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
1. I was receptive to the implementation of a chest pain protocol	1	2	3	4	5
2. The implementation of the chest pain protocol was effectively communicated	1	2	3	4	5
3. Using the Chest Pain Protocol better meets the needs of patient and families	1	2	3	4	5
4. Implementation of the Chest Pain Protocol improved patient outcomes	1	2	3	4	5
5. I was able to accomplish the interventions of the Chest Pain Protocol within my regular workload	1	2	3	4	5
6. There is adequate support and resources to utilize the Chest Pain protocol.	1	2	3	4	5
7. Using the Chest Pain Protocol meets the needs of nurses	1	2	3	4	5
8. Nurses would benefit from regular feedback on the impact of the Chest Pain Protocol	1	2	3	4	5
9. I believe that the Chest Pain Protocol has improved patient outcomes	1	2	3	4	5
10. I am satisfied with the Chest Pain Protocol	1	2	3	4	5

*Figure 1.* Measuring Nurse Satisfaction of the Chest Pain Protocol Survey Tool.

## Appendix B

<i>Survey Questions</i>	<b>Mean</b>
1. I was receptive to the implementation of a chest pain protocol.	3.84
2. The implementation of the chest pain protocol was effectively communicated.	3.06
3. Using the Chest Pain Protocol better meets the needs of patient and families.	3.74
4. Implementation of the Chest Pain Protocol improved patient outcomes.	3.64
5. I was able to accomplish the interventions of the Chest Pain Protocol within my regular workload.	3.22
6. There is adequate support and resources to utilize the Chest Pain protocol.	3.02
7. Using the Chest Pain Protocol meets the needs of nurses.	3.38
8. Nurses would benefit from regular feedback on the impact of the Chest Pain Protocol.	4.20
9. I believe that the Chest Pain Protocol has improved patient outcomes.	3.64
10. I am satisfied with the Chest Pain Protocol.	3.44

*Figure 2.* Survey questions with their corresponding mean values.

## Appendix C

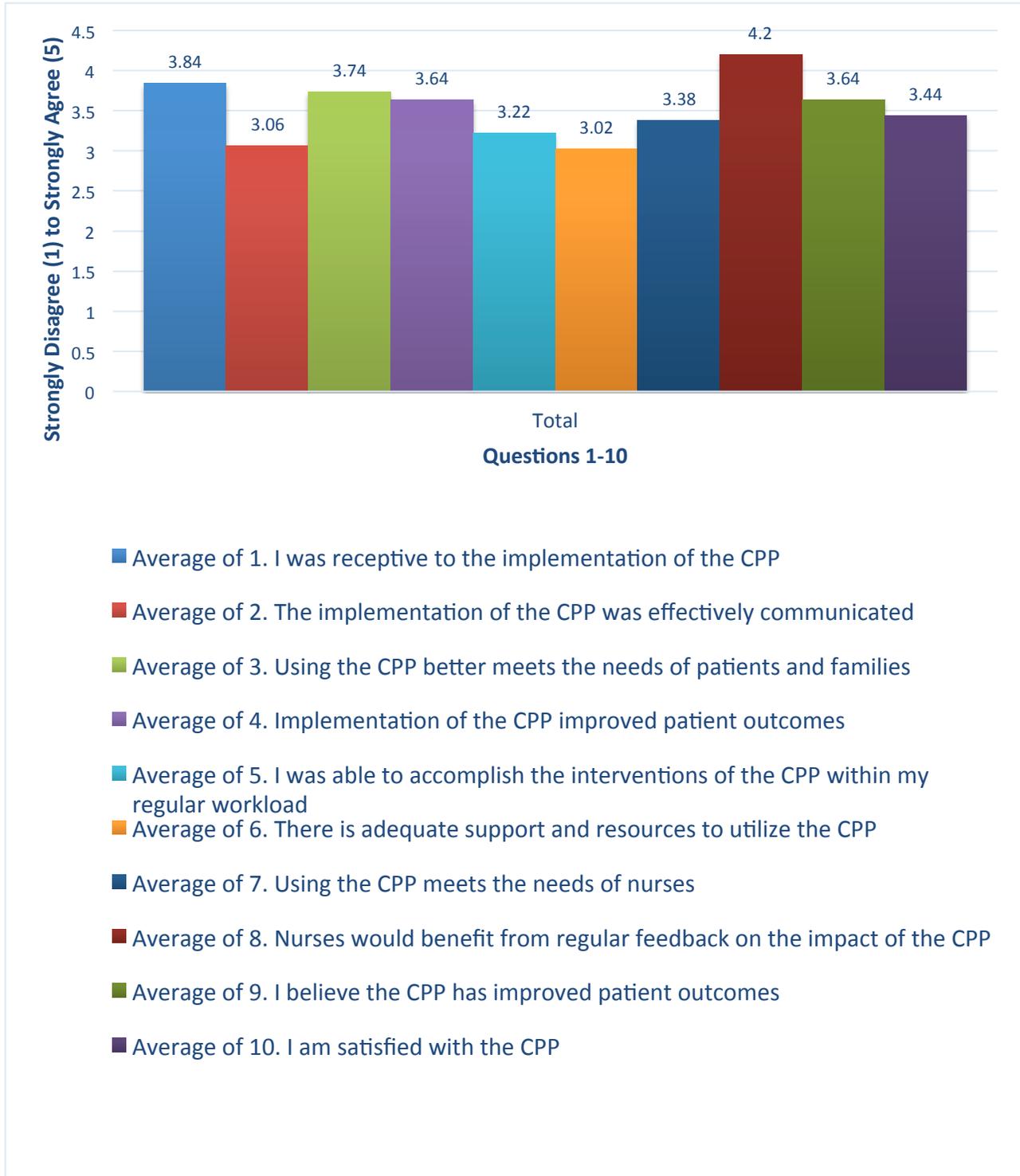


Figure 3. Survey questions numbered 1-10, rated strongly disagree (1) to strongly agree.