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Effect of Enhanced Patient Education on Patient Satisfaction and 30-Day Readmission Rates after Cardiac Arrhythmia Ablation

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Effect of Enhanced Patient Education on Patient Satisfaction and 30-Day Readmission

Rates after Cardiac Arrhythmia Ablation

Kristin Ann Bott, DNP

University of Connecticut (2016)

Patient satisfaction and 30-day hospital readmission rates are metrics used to assess quality of patient care. Dissatisfied patients pose a high risk of readmission (Boulding, Glickman, Manary, Schulman, Staelin, 2011) and during the vulnerable discharge period, 1 in 7 patients may experience an unavoidable readmission within 30-days post-procedure (Jencks, Williams, & Coleman, 2009). Successful patient education programs have been linked to improved patient satisfaction and subsequently reduced unnecessary readmissions (Murdock & Griffin, 2013; Hansen et al., 2011). In an effort to increase satisfaction and reduce readmissions much of the healthcare community's attention has turned to interventions that have these primary aims. Increased patient satisfaction and 30-day hospital readmission reduction post procedure have not been excessively studied in the cardiac arrhythmia ablation population, however these patients often present to their follow up appointments reporting that the procedure was not what was expected and report readmissions that could have been avoided (Ezzat, Chew, McCready, Lambiase, Chow, Lowe, Rowland, & Segal, 2013).

Utilizing a framework of the Health Belief Model (Janz & Becker, 1984), an enhanced post cardiac arrhythmia ablation education intervention based on the Project Red framework for re-engineering the discharge process, was delivered to patients in one practice who underwent cardiac arrhythmia ablation procedure with the aim of increasing patient awareness of their disease, clarifying post procedural expectations with the aim of increasing patient satisfaction, and reducing 30-day readmission rate in this population by providing the patient with education necessary to make an informed medical

decision on when to seek care. Results of this study support the implementation of enhanced patient education intervention during the vulnerable 24-72 hour post discharge period by showing a higher total patient satisfaction score in the group receiving the intervention ($M=633$, $SD=78$) compared to ($M=508$, $SD=137$) in the control group with a statistically significant difference between the means of the groups ($p=.005$). This study also showed a lower rate of 30-day readmissions in the intervention group (7.1%) compared to (53.3%) readmission rate of the control group with a statistically significant association ($p=.014$) and large magnitude of effect.

Results of this pilot study may be used for development and implementation of enhanced patient education programs aimed at increasing patient satisfaction and reducing 30-day readmission rates.

Effect of Enhanced Patient Education on Patient Satisfaction and 30-Day Readmission

Rates after Cardiac Arrhythmia Ablation

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APPROVAL PAGE

Doctor of Nursing Practice Dissertation

Effect of Enhanced Patient Education on Patient Satisfaction and 30-Day Readmission

Rates after Cardiac Arrhythmia Ablation

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CHAPTER 1

Introduction

Success of interventions and medical procedures has traditionally been assessed with outcomes measures such as complication and mortality rates. Recently, patient satisfaction and 30-day readmission rates have become an important measure of quality and cost of healthcare (Lazar, Fleischut, & Regan, 2013). In addition, with Medicare implementation of Hospital Care Quality Information from the Consumer Perspective (HCAHPS) to measure patients' perception of the hospital experience, and public reporting of this information, much of the focus on outcomes has shifted toward patient satisfaction. Findings suggest overall higher patient satisfaction rates are associated with lower 30-day hospital readmission rates (Boulding, Glickman, Manary, Schulma, & Staelin, 2011). Patient education geared towards specific interventions or medical treatment is shown to increase satisfaction and reduce readmission rates (Boulding et al., 2011).

Background of the Problem

It is estimated that greater than 5 million persons in the United States experience a cardiac arrhythmia annually (Tang, Gilligan, & Romero, 2014). Cardiac arrhythmias are a deviation from normal heart rhythm resulting in an irregular heartbeat. Cardiac arrhythmias include: atrial fibrillation, atrial flutter, ventricular tachycardia, ventricular fibrillation, supraventricular tachycardia, and accessory pathway associated arrhythmias such as Wolff-Parkinson-White Syndrome. Patients experiencing cardiac arrhythmias may suffer negative consequences, some becoming highly symptomatic. Symptoms associated with cardiac arrhythmias include: lightheadedness, dizziness, palpitations, syncope, and near syncope often leading patients to seek medical care (Reinstra, M., Lubitz, S., Mahida, S., Magnani, J., Fint, J.,

Sinner, M., VanGelder, I., Elinor, P., Benjamin, E, 2012). In 2006 alone, 3.1 billion dollars was paid to Medicare beneficiaries for care associated with cardiac arrhythmias (Agency for Healthcare Research and Quality, 2010). Current guidelines for treatment of cardiac arrhythmias are aimed at rate and rhythm control, symptom alleviation or reduction and prevention of sudden cardiac death (Zipes, Camm, Borggrefe, Buxton, Chaitman, Fromer, Gregoratos, Klein, Moss, Myerburg, Priori, Quinones, Roden, Silka, & Tracy, 2006; January, Wann, Alpert, Field, Calkins, Murray, Cleveland, Sacco, Cigarro, Stevenson, Conti, Tchou, Ellinor, Tracy, Ezekowitz, & Yancy, 2014). Treatment modalities include use of antiarrhythmic medications and/ or procedural treatments such as cardiac arrhythmia ablation procedures (January et al., 2014; Zipes et al., 2006).

Patient satisfaction has emerged as a quality indicator of critical importance to current evaluation of patient care. Higher patient satisfaction contributes to our ability to provide high quality patient care and is associated with improved outcomes (Kupfer & Bond, 2012). Medicare alone spends over 17 billion dollars for patient re-hospitalizations annually, with an estimate of 75% of 30-day readmissions deemed preventable. These preventable re-hospitalizations represent approximately 12 billion dollars in unnecessary Medicare expenditure (James, 2013). In response to this staggering statistic, the Hospital Readmission Reduction Program was established as part of the Affordable Care Act in 2012 (Center for Medicare and Medicaid Services (CMS), 2014). With this program, a 30-day hospital readmission penalty for particular diagnoses was implemented, resulting in either lower or non-existent reimbursement to hospitals receiving Medicare/Medicaid reimbursement when patients with these diagnoses were readmitted within 30 days of discharge. Although cardiac ablation is not included in the adopted readmission measures of the Hospital Readmission Reduction program, patient readmission post

ablation does contribute to an increase in the cost of healthcare and efforts to reduce readmissions should be addressed.

Readmissions within 30 days post cardiac arrhythmia ablation are typically related to postoperative complications and arrhythmia recurrence (Shah, Freeman, Shilane, Wang, Go, Hlatky, 2012). Patient dissatisfaction status post cardiac arrhythmia ablation procedure is often the result of unmet expectations as well as patient experienced and perceived negative post procedural outcomes (Ezzat, Chew, McCready, Lambiase, Chow, Lowe, Rowland, & Segal, 2013). The first few months following cardiac arrhythmia ablation procedure is termed the “blanking period” (Epicoc & Sorgente, 2014). During this period of time patients may experience recurrence of the arrhythmia and the sensation of palpitations as a normal variant (Darkner, Chen, Hansen, Pehrson, Nielsen, Svendsen, 2014). Hospital readmissions post ablation procedure are frequently due to palpitations and recurrence of the arrhythmia suggesting patients may not be aware of the normal expected variants after the ablation procedure (Ezzat et al, 2013). Post surgical patient expectations may not be apparent to the patient until they have returned home (Kazuare, Roman & Sosa, 2012), and during the vulnerable post discharge period, 1 in 7 surgical patients may experience a potentially avoidable readmission within 30 days post surgical procedure (Jencks, Williams, Coleman, 2009). These studies indicate the need for further patient education to improve patient expectations for normal post procedural variants and include guidance for when to seek medical attention.

Inadequate patient education has negatively impacted patient satisfaction and hospital reimbursement, while successful patient education programs have been linked with improvement in patient satisfaction scores (Murdock & Griffin, 2013). Current literature identifies the need to establish interventions aimed at reducing postoperative complications, improving patient

satisfaction and reducing 30-day readmission rates (Hansen, Young, Hinami, Leung, & Williams, 2011).

Significance

Nurse practitioners have the opportunity to improve patient satisfaction, improve patient outcomes, and potentially reduce 30-day readmission rates by exploration, utilization and implementation of improved teaching techniques post discharge (Alberti & Nannini, 2013). Post surgical patients have exhibited a significant need for enhanced discharge education related to home care, medications, treatment and potential complications (Uzun, Ucuzal, & Gonca, 2011), and reports indicate unmet patient expectations, lack of knowledge of disease and treatment, and lack of knowledge on when to seek medical attention results in surgical patients seeking further medical attention within 30 days post procedure (Hinami, Bilimora, Kallas, Simons, Christensen & Williams, 2014). Nursing has notably been deemed a crucial element in a successful discharge education program as the primary practitioner in contact with the patient (McAllister, Stewart, Ferrua, & McMurray, 2004). Implementation of enhanced education post cardiac arrhythmia ablation procedure may serve to set realistic expectations for this patient population, improve patient satisfaction scores, and reduce the 30-day readmission rate post cardiac arrhythmia ablation procedure.

Patient satisfaction with health care delivery has become a consistently measured parameter in our health care system and an integral part of assessing the patient experience (Guss, Leland, & Castillo, 2013). Although typical patient preparation for a cardiac ablation includes a pre-procedural consultation and distribution of standard of care post- procedural discharge instructions, patients express post- surgical concerns when the procedural outcome was

not what was expected. Patients may not always be clear about when they need to seek medical attention post- surgical procedure, and this uncertainty often lead to an unnecessary readmission and reduced patient satisfaction post- surgical procedure (Hinami et al, 2014; Awad & Chung, 2006).

It is estimated that patients will forget approximately half of the information delivered by the provider prior to leaving the consultation visit (Pellise & Sell, 2009; Treweek, Glenton, & Penrose, 2002). Improving patient understanding of their disease and potential complications post procedure are important factors in safely discharging post- procedural patients (Awad & Chung, 2006). A percentage of readmissions ranging from 23.9-54% are deemed avoidable (Paul, 2008; van Walraven, Jennings, & Forster, 2012) and are typically resultant of patients' lack of understanding of discharge instructions, medication regimen, follow up care, and when it is necessary to seek medical attention (van Walraven, Bennett, Jennings, Austin, & Forster, 2011). The discharge phone call has been shown to provide an opportunity to assess patients' knowledge, divert adverse events and improve patient satisfaction (Setia & Meade, 2009). It is possible this phone call can prevent readmissions by addressing the patient's needs during the acute post-discharge time period (Naylor, Aiken, Kurtzman, Olds, & Hirschman, 2011).

The need for this proposed pilot study is validated with the knowledge that post surgical patient expectations may not be apparent to the patient until they have returned home (Kazuare, Roman & Sosa, 2012) and that during the vulnerable post discharge period, 1 in 7 surgical patients may experience a potentially avoidable readmission within 30 days post surgical procedure (Jencks, Williams, Coleman, 2009). Furthermore, increased patient education to improve post procedure expectations has been shown to increase patient satisfaction and reduce 30-day readmission rates (Hinami et al, 2014; Reynolds, 2009).

Purpose

The purpose of this pilot study was to investigate the impact of the implementation of an enhanced post cardiac ablation education program, compared to standard discharge instructions, on patient satisfaction with care and hospital readmission within 30-days post procedure for a northeastern United States cardiology practice. Process data was collected to identify barriers and facilitators during implementation of the education program to understand and make modifications for program improvement.

There is a paucity in the literature related to existing post cardiac ablation education initiatives, however data retrieved from the 2014 average trend of readmission rates for one cardiac practice in the northern United States notes 28% of cardiac arrhythmia ablation patients sought further medical attention including emergency department visits, unscheduled office visits, visits to urgent care centers or hospital readmission within the first 30 days post cardiac arrhythmia ablation procedure. Review of the Press Ganey scores over one year for this practice shows patient dissatisfaction in areas related to a) discharge readiness, b) how to respond to symptoms after discharge, and c) deficit in instructions on how to care for themselves at home. As this practice does not currently provide a post- procedure phone call, implementing and evaluating a post cardiac arrhythmia ablation enhanced education intervention aimed to increase patient satisfaction and reduce the practice 30-day readmission rate from the 2014 rate of 28.57%.

Theoretical Framework

The Health Belief Model (Janz & Becker, 1984), as represented in figure 1.0, served as the conceptual framework for this study. This model provides an appropriate framework upon which to implement an enhanced education program for patients post cardiac ablation because this model explains why patients participate or choose not to participate in health promotion behaviors. The model is based on the premise that patients' beliefs and attitudes influence patients' decision making. The model incorporates the constructs that can be affected by education and intervention to alter the patient's beliefs, attitudes, and actions toward a specific health related matter.

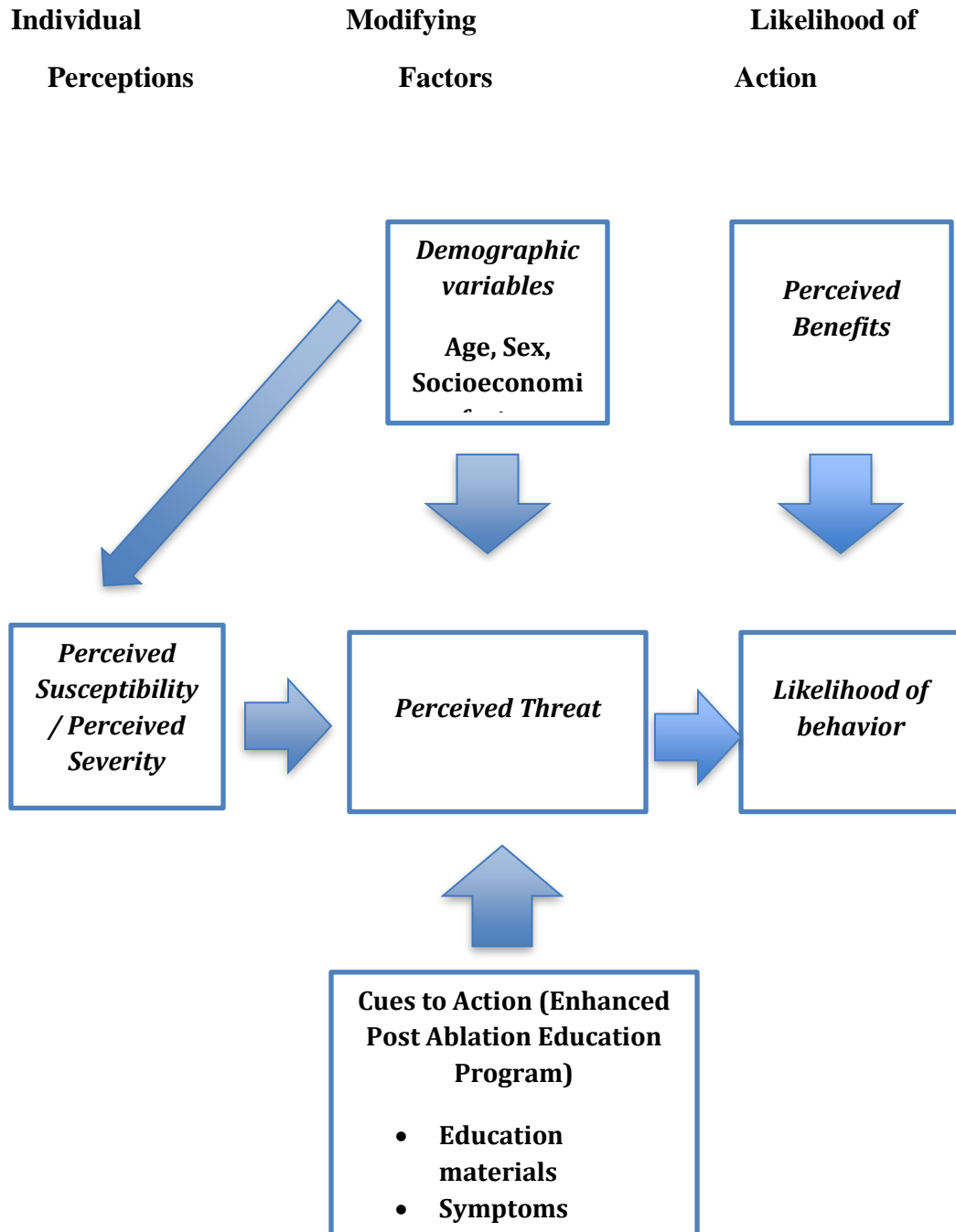


Figure 1.0 The Health Belief Model Adapted from Strecher & Rosenstock (1997), Janz & Becker (1984).

Permissions granted see appendix A

The Health Belief Model was developed in the early 1950's by a group of social psychologists with the United States Department of Public Health. The model was originally developed in an attempt to understand why there was a widespread failure of participation in screening programs for disease prevention. Historically, the Health Belief Model has been utilized to predict the utilization of medical services based on patient's experienced symptoms such as Berkanovic, Telesky, & Reeder, 1981.

The Health Belief Model consists of four core theoretical constructs which include: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers (Janz & Becker, 1984). The concept of self-efficacy was added to the earlier version of the model in 1988 (Rosenstock, Strecher, & Becker, 1988) as an attempt to increase the explanatory power of the model. Motivating factors and cues to action are also more recent construct additions to the model.

Perceived susceptibility consists of the patients' subjective assessment of how vulnerable they are to a particular condition or illness. The more susceptible the patient believes he/she is, the more likely the/she is to engage in actions that decrease the risk. Perceived severity envelopes the patient's perception of the seriousness of the illness or consequences that may ensue as a result of the illness. Consequences are inclusive of physical and social consequences. The combination of severity and susceptibility is the patient's perceived threat. The greater the patient's perceived threat, the more likely they are to engage in behavior change. The construct of perceived benefits is the patient's beliefs that the behavior will produce desirable outcomes in regards to the disease. The patient's perception of how efficacious the behavior is at decreasing the risk of the disease or its associated consequences will influence the patient's desire to follow a recommendation. In order for a behavior to be accepted or adopted by the patient, it must be

perceived that the benefits will outweigh the negatives allowing for barriers to be overcome. Perceived barriers are the patients' individual perceived obstacles to implementing the behavior change. Perceived barriers can prevent the patient from engaging in positive behavior even though the perceived threat is high. Modifying variables including demographics, psychosocial variables, and structural variables such as prior knowledge about the disease, are recognized as contributing to the patient's perception of the constructs of the Health Belief Model. The Health Belief Model suggests that cues to action are the triggers that change behavior. The cue can be internal such as expression of pain or external such as an educational cue.

Assumptions Derived from the Health Belief Model

Adoption of the Health Belief Model as a framework for implementation of an enhanced education program in the post cardiac arrhythmia ablation population helped to demonstrate and identify the cue to action to affect change in the patient's beliefs, attitudes, and further actions after their cardiac arrhythmia ablation procedure. Cues to action were identified as the trigger that led the patient to make a decision. Knowledge gained from the enhanced post cardiac ablation education may trigger the patient to make a decision whether or not to seek treatment and influence their overall satisfaction. The cardiac ablation patient population possesses the common thread of experiencing the disease state of a cardiac arrhythmia. Although each patient will express the arrhythmia differently and will have inherent risks associated specifically to the individual, the model is applicable to each patient in this population.

When the patient believes that they are highly susceptible to worse/ negative outcomes, they will be inclined to seek help more often (Glanz, Rimer, & Lewis, 2002). Through an enhanced education intervention post cardiac ablation, the Advanced Practice nurse educated the

patient on appropriate response post cardiac ablation preparing the patient for adverse outcomes that would require seeking medical attention and those outcomes that would be expected post cardiac ablation procedure, perceivably decreasing the patients perceived susceptibility.

The constructs of perceived susceptibility, perceived severity, perceived benefits, and perceived barriers are all applicable to the cardiac arrhythmia ablation patient and may influence their attitude toward their satisfaction with the procedure and may affect the decision they make whether or not to seek medical treatment. For example, the cardiac arrhythmia ablation patient must be knowledgeable about their disease, the treatment that they received, and understand expectations post procedurally in order to appreciate their susceptibility and understand the severity. If the patient does not understand the disease, the procedure and the importance of the instructions provided they may not adhere to the discharge instructions provided which can result in non-compliance, dissatisfaction, and unnecessary readmission. Understanding the magnitude of the disease and treatment that the patient has received serves cardiac arrhythmia ablation patient as understanding perceived severity will help to guide the patient along a decision making path. Perceived benefits or knowing why following particular instructions or recommendations are important assists the patient in making the decision to follow those instructions/recommendations or not. The cardiac arrhythmia ablation patient may have increased or decreased perceived barriers based on demographic situations and influences such as prior conceptions and past experience with surgical procedures. Perceived barriers such as knowing who to contact when they return home, symptoms that require immediate medical attention, and expectations post operative addressed at time of post cardiac arrhythmia ablation enhanced education intervention will decrease the patients' perceived barriers. Enhanced educational intervention post cardiac arrhythmia ablation served as a cue to action providing the patient with

strategy to activate and address the perceived problem. Through enhanced educational intervention, patients will possess the knowledge necessary to make them feel empowered to act and seek medical attention when necessary and provide the same confidence with the decision not to seek medical treatment.

Research Questions

The following questions were addressed in this study:

- 1) What is the effect of a post cardiac arrhythmia ablation enhanced education program on patient satisfaction with care when compared to patient satisfaction with care in sample of post cardiac arrhythmia ablation patients receiving current standard of care.
- 2) What is the effect of a post cardiac arrhythmia ablation enhanced education program on 30-day readmission rate when compared to 30-day readmission rate in sample of post cardiac arrhythmia ablation patients receiving current standard of care.
- 3) What are barriers and facilitators to implementing a cardiac ablation enhanced education program on patient satisfaction and readmission rates in a sample of post cardiac ablation patients.

Definition of Key Terms/Variable

Patient Satisfaction

Conceptual Definition

The conceptual definition of patient satisfaction as defined by Palmer, Donabedian & Pover, 1991, is the judgment made by a recipient of care as to whether their expectations for care have been met or not (Palmer, Donabedian, & Pover, 1991).

Operational Definition

For the purpose of the proposed study, patient satisfaction will be measured by the self-reported responses on the adapted version of the NHS Adult Inpatient Satisfaction Survey (Appendix B).

Readmission

Conceptual Definition

The conceptual definition as defined by Center for Medicare and Medicaid Services of readmission is an admission to a hospital within 30 days of a discharge from the same or another hospital (Center for Medicare and Medicaid Services, 2011).

Operational Definition

For the purpose of the proposed study, readmission will be measured by a telephone call administered by the PI at after 30 days has passed post ablation. The following question will be asked:

Have you experienced any of the following after your cardiac arrhythmia ablation?

- admitted to the hospital following discharge after your cardiac arrhythmia ablation procedure
- seen in the emergency department after discharge from your cardiac arrhythmia ablation procedure
- seen in an urgent care setting following discharge from your cardiac arrhythmia ablation procedure
- been admitted to the hospital as an observation patient following your cardiac arrhythmia ablation procedure

Enhanced Patient Education

Conceptual Definition

The conceptual definition of enhanced patient education is a systematic experience in which a combination of teaching methods may be delivered to patients and caregivers by healthcare professionals to increase knowledge of their disease or procedure that may alter health behaviors, improve health status or affect health related decisions (Hernandez, Greiner, Fonarow, Hammill, Heidenreich, Yancy, Peterson, & Curtis, 2010; Treweek, Glenton, Oxman, & Penrose, 2002; Coulter, Entwistle & Gilbert, 1999).

Operational Definition

For the purpose of this proposed study, enhanced patient education will be the program delivered by the primary investigator to study subjects in the intervention group via a phone call within 24-

72 hours post cardiac arrhythmia ablation procedure utilizing a phone script that has been adapted from the Project Red toolkit (Adams, Stephens, Whiteman, Kersteen, Katruska, 2014).

Standard of Care

Conceptual Definition

The conceptual definition for standard of care as noted by Moffett & Moore, 2011 is “that which is typically done plus anything that seems reasonable even if not typically done”.

Operational Definition

For the purpose of this proposed study standard of care is operationally defined as the current discharge practice in place prior to implementation of an enhanced education intervention post cardiac arrhythmia ablation procedure. Current post cardiac arrhythmia ablation process involves distribution by the hospital nursing staff of generic post cardiac ablation instructions and does not include a follow up instructive phone call as part of the discharge process.

Summary

Patient satisfaction and 30-day readmission rates are measures utilized to assess quality of care. Cardiac arrhythmias are a significant source of healthcare resource utilization. Cardiac arrhythmia ablation procedures aim at improving patient outcome and symptom alleviation. Patient education delivered by a nurse in the post discharge period between 24-72 hours has been shown to improve patient satisfaction and reduce readmission rates. This research study is built upon the Health Belief Model as framework for design, implementation and evaluation of outcomes which is an appropriate fit to guide the proposed study. Through use of the model, the advanced practice nurse can differentiate between concepts of patient beliefs and what they mean

so further investigation can explore outcomes of this research. Results of this study may serve to provide an operational framework for development of enhanced patient education programs for other specialty areas and invite development of future enhanced patient education interventions aimed at improving patient satisfaction and reduction of readmission rates.

CHAPTER 2

Introduction

This chapter presents an integrated review of theoretical and empiric literature providing a framework for the development of this study. Review of literature commences with examination of the theoretical literature that was used to provide a framework for this proposed study then proceeds to the reporting of empiric literature relevant to this study. The existing gaps in research, need for further study, and summary of the literature supporting the necessity of this study are presented.

Search for the relevant literature related to this study was conducted utilizing PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Scopus, ProQuest, and Medline. The search topics of focus included Health Belief Model, patient satisfaction, patient education, cardiac ablation, and readmission rates. The focus was narrowed by including the discriminators of full text, English language and not older than 5 years. Landmark studies providing strong evidence in support of this study were included even if older than 5 years.

An initial search was conducted with focus on theoretical literature supporting the Health Belief Model for utilization and application in this study. The broad search term Health Belief Model revealed six (6) articles appropriate for inclusion in this study.

A search with focus on empirical literature providing evidence of support for this study was performed utilizing key words: cardiac ablation, patient satisfaction, patient education, and 30-day readmission rates. The initial search of these terms produced 9,888 articles for review. Although the initial number of publications was vast, a limited number of studies directly addressed the cardiac arrhythmia ablation population. Due to the lack of available studies on this

particular subject matter, the search was expanded back as far as the year 1980 if the study was considered a landmark study with highly recognizable and valuable contribution to current practice. The search was also expanded to use of material from other disciplines if highly relevant to this particular study. Research in patient satisfaction, patient education, and hospital readmission rates was adapted from multiple disciplines to identify supportive structure to the framework of this study and to identify gaps in the literature. The initial gap identified is the lack of research studies performed in relation to patient education, patient satisfaction, and 30-day readmission rates in this particular study population.

Review of Theoretical Literature

The Health Belief Model was developed in the early 1950's by a group of social psychologists with the United States Department of Public Health (Janz & Becker, 1984). The model was originally developed in an attempt to understand why there was a widespread failure of participation in screening programs for disease prevention. The Health Belief Model has been widely utilized throughout the decades and has more recently been applied to patients' understanding of disease and response to symptoms of the disease.

Wang, Zang, Bai, Liu, Zhao, and Zhang (2013) conducted a randomized control trial utilizing the Health Belief Model as a framework for development and implementation of the nursing intervention. The intervention consisted of a Health Belief Model educational intervention for the intervention group and standard care for the control group. The educational intervention followed the Health Belief Model based on the tenets of nursing intervention and included 1) patient susceptibility 2) assisting patients to recognized benefits of treatment and healthy behaviors in relation to their COPD 3) assisting participant to overcome barriers,

allowing them to move toward healthy behavior 4) increasing patient confidence through knowledge of their disease and 5) instructing participants on signals used to monitor their disease. Results of the study showed significantly increased self-efficacy and health belief scores with the intervention group. In this study, Wang et al. (2013) show appropriate use of the Health Belief Model and present general applicability of the model for educational interventions aimed at improving patient self-efficacy, improving health belief status and possibly reducing hospital readmissions.

The Health Belief Model suggests that persons' health actions are dependent on four core measures: perceived susceptibility, perceived barriers and benefits, cues to action, and self-efficacy. Holland, Carthron, and Duren-Winfield (2014) developed and implemented a study utilizing the Health Belief Model as a framework to pilot a culturally- specific curriculum for African-American students to increase their awareness of their risk of cardiovascular disease. The study was designed to raise awareness about the participants self, their risk factors for cardiovascular disease and to increase motivation of unhealthy behaviors (Holland et al., 2014). This study provides an example of implementing participant education to increase self- efficacy and modify participant behavior.

Heart failure patients represent a vulnerable population after discharge. Baghianimoghadam, Shogafard, Sanati, Baghianimoghadam, Mazloomi, & Askarshahi (2013) performed a cohort experimental study, in which education as intervention factor was delivered to the study group. Study participants were heart failure patients referred to the Shahid Rajaei Center of Heart Research . The study consisted of 180 study participants divided into two groups, 90 in the control group and 90 in the study group. The Health Belief Model served as a framework to compare health behaviors. The behavioral questionnaire administered included 69

questions. These authors found 38% of participants did not know what heart failure was and 43% were unaware of dietary restrictions in heart failure. Results of the study demonstrated a significant difference between the mean grades score of variables (perceived susceptibility, perceived threat, knowledge, Perceived benefits, Perceived severity, self-efficacy Perceived barriers, cues to action, self- behavior) between the two groups. The educational intervention group demonstrated higher scores in all of the Health Belief Model Variables measured. According to Baghianimoghadam et al. (2013), The Health Belief Model has the potential to be utilized as framework to establish educational programs aimed at disease prevention and their complications.

Summary of Theoretical Literature

The Health Belief Model (HBM) is one of the most widely used models in public health research and practice (Baghianimoghadam et al., 2013) and has been applied to studies on reducing readmission rates and improving patient self- efficacy with the possible outcome of improved satisfaction. Review of literature shows use of the model as a framework for development of patient educational interventions. These studies described patients' lack of knowledge of their disease and how to best manage it and demonstrated that an increase in patient awareness and knowledge of their disease leads to increased self-efficacy, health belief status and behavior modification. When patients are unaware, they are unable to make decisions and informed choices as to appropriate action in regards to their own health. The HBM builds upon constructs addressing patients' healthcare beliefs, attitudes, and actions. Through the development of educational interventions built on the Health Belief Model framework it may be possible to distinguish attributes of patients' health related attitudes that lead to increased patient satisfaction and reduced hospital readmissions.

Review of empiric literature

Patient satisfaction and cardiac ablation procedures

Atrial fibrillation ablation is a common procedure, yet there is a lack of published data assessing patient satisfaction after this procedure. Based on this research gap, Ezzat, Chew, McCready, Lambiase, Chow, Lowe, Rowland, & Segal (2013) carried out a study to measure patient satisfaction during all stages of atrial fibrillation patient experience and identified variables associated with both high and low patient satisfaction to guide future improvement measures (Ezzat et al., 2013). These authors used a sample of patients (n=165) who presented for elective catheter ablation for atrial fibrillation, and surveyed them with a questionnaire based on the NHS Adult Inpatient Survey designed to assess satisfaction in patients undergoing atrial fibrillation ablation procedures. Results of the study show 73% of those surveyed rated their outpatient and pre-assessment consultation as good, while 86% rated the outpatient portion as excellent. Of those surveyed, 53% reported receiving written information prior to the ablation procedure and 55% needed to utilize the internet to obtain more information regarding the ablation procedure. Of those surveyed, 99% reported that they felt prepared at the time of the procedure, however 31% of those surveyed reported that the ablation procedure was not what they had expected. This study has identified that some patients have negative experiences during and immediately following the ablation procedure and suggests that patient dissatisfaction may be related to inadequate analgesia. These authors suggest future strategies to improve post procedural communication may improve post procedural expectations.

Wolber, Choi, Brunkhorst, Schmeid, Steffel, Lushcer, & Duru (2010), conducted the first study evaluate patient satisfaction with outpatient cardiac ablation compared to inpatient cardiac

ablation in patients with supraventricular tachycardia. Based on current guidelines, catheter ablation for supraventricular tachycardia is a safe and effective management strategy (ACC/AHA/HRS Guidelines for management of patients with supraventricular arrhythmias, 2013). Frequently patients are admitted for a short duration hospital stay to monitor for post-procedural complications and possible recurrence of the arrhythmia (Wolber et al, 2010). Studies with AV nodal ablation and accessory pathway ablation procedures have demonstrated that the procedures can be performed safely on an outpatient basis (Wolber et al, 2010). These authors prospectively evaluated the feasibility of ablation for supraventricular tachycardia as an outpatient procedure, and compared two groups (n=119) of outpatients and inpatients who underwent cardiac ablation for supraventricular tachycardia and found no significant difference in patient satisfaction between inpatient and outpatient procedure. In addition, they found a statistically significant improvement in how quickly the patients in the outpatient group returned to work and resumed regular activity compared to the inpatient group ($p=0.001$). Importantly, these authors found no difference in procedural primary and long-term success rates between the groups factors affecting patient satisfaction including : physician care, nurse care, pre-intervention information, patient scheduling and coordination, persisting symptoms after ablation and hematoma/bruising. Findings from this study point to the need for further research to target factors impacting patient satisfaction in this patient population.

Patient education and patient satisfaction

Patient satisfaction is an important measure of quality improvement in healthcare (Lo, Stuenkel, & Rodriguez, 2009) and is a key goal in the same day surgery setting (Barnes, 2001). Though this particular study by Lo et al (2009) is not the most current, it is important to include this type of study as the same day surgery population studied in this article is highly

representative of the cardiac ablation population. Aside from atrial fibrillation ablation procedures, left sided pathway procedures and complicated ablation cases, uncomplicated cardiac ablation patients, which constitutes a large number of the cardiac ablation population including SVT, uncomplicated VT, atrial flutter, PVC, WPW ablations are discharged home on the same day of cardiac ablation procedure.

Based on nursing observations of apparent lack of patient knowledge post operatively despite perioperative instructions, Lo et al, (2009) hypothesized that lack of diagnosis specific patient education was a factor in decreased patient satisfaction scores in the post-operative population. A retrospective evaluative study was performed to assess differences in mean patient satisfaction scores utilizing diagnosis-specific discharge instructions compared to mean patient satisfaction scores reported three (3) months prior to implementation of diagnosis-specific discharge instructions. The convenience sample consisted of (n=1171) total participant post-surgical patients. The post- surgical patients were categorized as follows: ambulatory surgery unit (n=602), endoscopy unit (n=84), and main surgery unit (n=485). Due to the limitation that the survey was administered and collected by a contractor, the data available was mean patient satisfaction scores for the time period before and after the intervention. Results showed the post project intervention patient satisfaction scores increased after the implementation of diagnosis specific discharge instructions. This study shows that implementation of diagnosis specific discharge instruction positively impacts patient satisfaction which is a measure of quality of care.

Patient satisfaction encompasses patient experience and the magnitude to which the service provided matched patient expectations. Patient satisfaction is a measure of the quality of health services provided (Jean-Pierre, Fiscella, Freund, Clark, Darnell, Holde, Post, Patierno, Winters, & Patient Navigation Research Group, 2011). Sutherland & McLaughlan (2013) performed a quantitative research design study to retrospectively survey 2 groups of participants and explore the potential impact of the timing of patient education on levels of patient satisfaction. Participants (n=350) were identified from a cancer center database and randomized into two groups. Group 1 received radiation therapy education session following their first radiation treatment session. Group 2 received radiation therapy education session approximately 2 weeks prior to initiating radiation therapy. The authors (Sutherland & McLaughlan, 2013) developed a self-administered survey for use in this study with questions derived from the Survey of Manitobans Treated for Rectal Cancer. This survey addressed patient satisfaction related to information provided to the participant about scheduling and appointments, adverse effects and management, preparedness for radiation therapy treatment, preference regarding the timing of the education session, and the quality and amount of information provided,. Results of the study indicated no statistically significant difference in level of satisfaction between the two groups ($p>0.05$). Timing of patient education sessions did not affect the results of patient satisfaction surveys. However, the study did find patients reported less satisfaction with information they received regarding adverse effects of the treatment procedure and how to cope with potential adverse effects of the treatment procedure. The results of this study suggest patient education focused on adverse effects of treatment and how to manage those adverse effects may improve patient satisfaction with treatment. The findings of this study may be applied to a

number of different patient populations including that of post-operative cardiac arrhythmia ablation patients.

In an additional work by Braun, Baidusi, Alroy, & Azzam (2009) a study was performed to assess whether “tight” telephone follow up, defined as 1 week and 1 month post discharge, compared to the control group resulted in increased patient satisfaction, improved compliance, and reduction in re-hospitalization rate. The sample size of (n= 400) patients were randomized into two groups. Each patient group received a phone call 3 months post discharge regardless of the group they were designated to. In addition, the intervention group received a phone call at 1 week and 1 month. Results showed statistically significant improvement in patient satisfaction in the intervention group compared to control ($p=0.02$). Although the data measuring re-hospitalization was not statistically significant, a trend toward re-hospitalization reduction was observed ($p=0.062$). Findings from this study support the implementation of a post discharge telephone follow up to improve patient satisfaction.

Press Ganey surveys are often utilized in health care facilities to assess quality of care and patient satisfaction (Guss, Leland, & Castillo, 2014). In this study, the authors aimed at assessing the impact of a post discharge phone call after a patient was discharged from the emergency department (ED). Press Ganey surveys were mailed to 50% of randomly selected patients discharged from the ED (n=368) and those patients were randomized into two groups, follow up telephone call and no follow up telephone call. The key outcome variable was “likelihood to recommend”, a measure utilized to represent patient satisfaction with the scale of 1-5 with 5 the highest, or best rating. For purposes of this study, the authors utilized (5) as a “yes” to the likely to recommend question, 1-4 was not considered a “yes”. Results show 89% of the telephone call back group recorded a “yes” on the question likely to recommend as compared

to 55.6% of the no telephone call back group recorded a “yes” on the likely to recommend question. This study provides support to utilization of a telephone intervention to increase patient satisfaction.

Patient satisfaction and hospital readmission

The Centers from Medicare and Medicaid Services estimate within 30 days of all cause hospital discharge, nearly one-fifth of Medicare beneficiaries will be readmitted (Jencks, & Coleman, 2009). Costs for hospital readmission within 30 days of discharge are estimated at 17.4 billion dollar cost annually (Jencks, & Coleman, 2009). To better understand ways to reduce these readmissions and associated costs, Boulding, Glickman, Manary, Schilman, and Staelin (2011) performed a study to determine if hospitals with higher patient satisfaction scores were more likely to have a lower 30-day readmission rates. This cross-sectional observational analysis study used the Hospital Compare data on clinical performance, Press Ganey survey for patient satisfaction, and 30-day readmission rates during the time period of July 2005 to June 2008 from approximately 2500 hospitals in the United States. This study reviewed three specific conditions: acute myocardial infarction (AMI), heart failure (HF), and pneumonia (PNA) and the re-admission rates associated with these.

Multivariate logistic regression analysis was performed for each of the 3 clinical diagnoses (AMI, HF, PNA) to determine the relationship between patient’s reported satisfaction and 30-day readmission rates (Boulding et al., 2011). Results of the study show higher patient satisfaction scores were associated with a lower 30-day readmission rate. This study correlates higher patient satisfaction and lower 30-day hospital readmission rates for the specific conditions of AMI, HF, and PNA.

Patient education and hospital readmission

Thirty (30) day hospital readmission rates have been identified and utilized as a marker of quality of care. Multiple studies have been performed to suggest discharge education interventions reduce hospital readmissions (Harrison, Hara, Pope, Young, & Rula, 2011; Anderson, Helms, Hanson, & DeVilder, 1999; Postin, Dumas, & Edlund, 2014). Jack, Chetty, Anthony, Greenwald, Sanchez, Johnson, Forsythe, O'Donnell, Paasche-Orlow, Manasseh, Martin, & Culpepper, 2009 tested the effects of a nursing intervention aimed at minimizing hospital utilization after discharge. The study was funded by the Agency for Healthcare Research and Quality and the National Heart, Lung, and Blood Institute and was termed Project RED (Jack et al., 2009).

This randomized control trial consisted of a sample size of 749 English speaking adult patients from a single center with randomization to the intervention group (n= 370) and to the control group (n= 368). The intervention group received education from a nurse discharge advocate, medication reconciliation with the nurse advocate, specialized patient education booklet, follow up appointments, pharmacist phone call to review medications and discharge instructions within 2-4 days following discharge. The intervention group had lower primary outcome rates of emergency room visits and hospital readmissions within 30-days after discharge compared to the control group ($p=0.009$), with the most effective results in participants who had been hospitalized within 6 months prior to the current admission ($p=0.014$). Secondary outcomes of patient self-reported readiness for discharge, frequency of primary care provider follow up within 30 days of discharge from hospital, and knowledge of their discharge diagnosis were identified. The intervention group could identify their discharge diagnosis 79% of time compared to the non-intervention group at 70% ($p=0.017$). Follow up with primary care provider (PCP)

was higher in the intervention group compared to the non-intervention group with 62% and 44% respectively ($p < 0.001$). The intervention group also self-reported that they felt prepared for discharge during the 30-day phone call that all participants received. This study shows use of an enhanced patient education discharge program reduces the rate of 30-day readmissions and improves secondary outcomes of PCP follow-up, readiness for discharge, and knowledge of discharge diagnosis. Although the study is not directly associated with the cardiac ablation population, this study is included as it aims to utilize a patient education process to reduce hospital readmissions (Jack et al, 2009).

Harrison, Auebach, Quinn, Kynoch, & Mourad, (2014) performed a study to determine the effect of post discharge phone call on hospital readmissions. This retrospective observational study studied patients discharged from a general medicine service at a tertiary care academic medical center. The intervention consisted of a telephone call by a nurse within 72 hours after discharge. The nurses followed a standardized script for consistency. The telephone calls possessed the purpose of addressing possible patient issues with symptoms, medications, and follow up care. Patients in the group that received the phone call ($n=155$) had significantly lower rate of readmission compared to those patients who did not participate in the phone call ($n=123$) ($p=0.01$). Multivariate models adjusted for socio-demographic variables also showed the phone call intervention was associated with lower rate of readmission, however, when the models were adjusted for likelihood of receiving the phone call, there was no evident association between the phone call intervention and readmission rates. Though the statistics did not support telephone intervention leading to lower readmission rates in all logistical models, it does show that patients provided the opportunity for the phone call, and who were able to answer the phone call, did benefit from post discharge telephone intervention.

Patients seeking care postsurgical procedure add to the increased cost of healthcare. Historical research of patient education methods, patient's learning needs and processing of knowledge confirms that patient education can make a positive contribution toward patient health outcomes (Pullar, Roach, Mellor, McNeece, Judd, & Feely 1989; Opdycke, Ascione, Shimp & Rosen, 1992). Although not recent, Henderson & Zernicke (2001) studied the impact of discharge information and the patient's likelihood to seek care and did show a correlation between patient education and medical seeking behaviors.

This study of adult surgical patients (n=158) examined if routine information provided about management of pain and wound care during hospitalization was sufficient for them to care for themselves without seeking assistance from a health professional or health care agency (Henderson & Zernicke, 2001). A written questionnaire was distributed within 24 hours prior to discharge and a telephone interview was conducted at 1 to 2 weeks after discharge. The authors were interested in determining if there is a difference in the patients' perception of adequacy of discharge information at time of discharge compared to 1-2 weeks post discharge and if a difference exists in these patients frequency of seeking care after discharge. At the time of discharge, 91% of patients (n= 105) reported that discharge information was sufficient, compared to two weeks post discharge where 78% (n=90) report discharge information was sufficient ($p<0.05$). Results of the study showed patients who received information and a telephone phone call interview were less likely to access a healthcare facility than those who had not received information and telephone interview ($p<0.01$). This article supports the use of detailed discharge instructions specific to the patients' particular diagnosis and telephone call intervention to reduce readmission rates.

The impact of recurrent hospital admissions is a burden on our healthcare system and is a major contributor to our increasing healthcare expenditure. Many hospital readmissions are preventable (Harrison, Hara, Pope, Young, & Rula, 2011). Harrison et al. (2011), performed a retrospective cohort study with the aim of reducing hospital readmissions by offering a telephone intervention to all members of a large commercial health plan with Medicare advantage who were enrolled in a chronic disease management program all cause hospital admission during 2008 (Harrison et al., 2011). The intervention telephone follow up addressed patient understanding of and adherence to discharge instructions following hospitalization and was performed within the first two to three weeks following discharge. According to Harrison et al. (2011), the two week post discharge period is considered the critical time frame for prevention of readmission. The sample size for this study was (n=30,272) with the intervention group (n=6773) and the comparison group (n=23,499). Results of the study showed that the highest readmission rate occurred on days 2-3 post discharge, one third of the readmission occurred within 7 days of hospital discharge and over half occurred within fourteen days of hospital discharge (Harrison et al., 2011). Further results show patients who did not receive a call within 14 days after discharge were 1.3 times more likely to be readmitted within 30 days ($p=0.043$). The intervention group receiving the phone call was 23.1% less likely to present to the hospital for readmission, compared to those patients who did not receive the intervention phone call. Results of this study support the implementation of a post cardiac ablation enhanced education intervention after discharge from hospital following cardiac ablation procedure.

Part of the surgical process is the post- surgical discharge process. Among the components that the discharge process must address are the treatment received, potential post-surgical complications, medications, activity post- surgery, and follow up care. Post-surgical

discharge education aims at addressing the aforementioned items as well as preparing the patient to assume a level of responsibility for their own care and be able to make medical decisions (Uzun, Ucuzal, & Inan, 2011). A pilot study by Uzun, Ucuzal, & Inan (2011) was performed to determine whether post discharge needs of surgical patients were accomplished with current standard of care discharge education. The study was a cross-sectional and descriptive pilot study consisting of 90 participants. The setting for the study was a general surgical department in a university medical center. This study used Patient Learning Needs Scale (PLNS) to assess participant learning needs following the completion of discharge instructions prior to leaving the facility. Results of the study reveal 50% of patients reported that they did not receive sufficient information relevant to their discharge and there were no statistical significance identified in PLNS scores according to patient characteristics ($p > 0.05$). Participants did rate treatment, complications, and medications with a high level of importance. Conclusions of this study, with half of the participants reporting insufficient discharge instructions and inadequately met learning needs, suggest the need for an enhanced patient education intervention to be implemented post procedurally (Uzun, Ucuzal, Inan, 2011).

Summary of Empiric Literature

Review of empiric literature represents data in support of positive patient satisfaction outcomes and reduction in 30-day readmission rates with implementation of enhanced, focused patient education programs aimed at increasing patient knowledge and awareness of their diagnosis, procedure, potential complications, post- procedural expectations and how to cope with adverse events should they occur.

Limited data exists specific to the cardiac arrhythmia ablation patient population suggesting further research be performed in this patient population however, the study that was available for review encourages the fact that patient satisfaction is effected by the entire patient experience, learning from the less favorable satisfaction scores is important along with the higher patient satisfaction scores.

Review of empiric literature provides evidence of unmet expectations and include patient satisfaction and cardiac ablation, patient education and patient satisfaction, patient satisfaction and hospital readmissions, patient education and hospital readmissions. Unmet expectations are in the context of each category and can be a contributing factor to reduced patient satisfaction and hospital readmissions. Patient knowledge through education may lead to increased patient satisfaction and reduced 30-day readmission rates in the post cardiac arrhythmia ablation population.

Chapter Evaluation and Summary

Utilizing the Health Belief Model as a theoretical framework provides an appropriate strategy for development of an enhanced educational program for post-operative cardiac arrhythmia ablation patients aimed at reduction of 30-day readmission rates and improvement in patient satisfaction. Identification and implementation of a process by which the patient possesses increased knowledge of their disease, procedure, post-operative follow up and care may lead to more realistic patient expectations resulting in a favorable patient satisfaction and readmission outcome.

CHAPTER 3

Introduction

Based on current guidelines, cardiac arrhythmia ablation procedures are considered a reasonable option for the treatment of cardiac arrhythmias (Zipes, Camm, Borgghefe, Buxton, Chaitman, Fromer, Gregoratos, Klein, Moss, Myerburg, Priori, Quinones, Roden, Silka, & Tracy, 2006; Fuster, Ryden, Cannom, Crijn, Curtis, Ellenbogen, Halperin, LeHeuzey, Kat, Lowe, Olsson, Prystowsky, Tamargo, & Wann. 2006). Research participants were cardiac arrhythmia ablation patients treated by an electrophysiologist in a cardiology center located in the northeastern United States. The pilot study investigated the impact of an enhanced post cardiac arrhythmia ablation education program on patient satisfaction and hospital readmission within 30 days post procedure. Process data was collected to identify strengths and weaknesses during implementation of the education program to make modifications for program improvement. It is hypothesized that implementation of an enhanced education program post cardiac arrhythmia ablation procedure will improve patient satisfaction and reduce 30-day hospital readmission rates.

This chapter describes the methods that will be used in the research study including research questions, methods, sample, protection of human subjects, instrument used, setting, procedure, design, and treatment of data and analysis. This chapter concludes with a discussion summarizing the proposed research study process and data analysis.

Research Questions

The research questions for this study are:

- 1) What is the effect of a post cardiac arrhythmia ablation enhanced education program on patient satisfaction with care when compared to patient satisfaction with care in sample of post cardiac arrhythmia ablation patients receiving current standard of care.
- 2) What is the effect of a post cardiac arrhythmia ablation enhanced education program on 30-day readmission rate when compared to 30-day readmission rate in sample of post cardiac arrhythmia ablation patients receiving current standard of care.
3. What are barriers and facilitators to implementing a cardiac ablation enhanced education program on patient satisfaction and readmission rates in a sample of post cardiac ablation patients.

Procedure

Study participants were identified after completion of their consultation visit for cardiac ablation. All adult patients over age 18 with cardiac arrhythmias referred to study site for cardiac arrhythmia ablation procedure were approached by the student investigator (SI) nurse practitioner for study participation after the cardiac arrhythmia consultation visit with the electrophysiologist had concluded both in the hospital and office setting. Patients not meeting inclusion criteria were excluded from the study. Eligible patients were approached by student investigator nurse practitioner after completion of the consultation appointment and the patient had confirmed interest in proceeding with cardiac arrhythmia ablation procedure. Consent for participation in the study was obtained after the consultation visit and before the ablation

procedure by the student investigator nurse practitioner. The student investigator included all items on the consent check list (see Appendix H) when obtaining consent to provide consistency with consent procedure between potential study participants. The nurse practitioner obtaining consent followed the study participant consent script (Appendix J) when discussing consent with potential study participants.

Random assignment into study groups was performed by sequentially assigning study participants to control group or intervention group. Assignment began with study participant one being assigned to the control group followed by study participant two being assigned to the intervention group. The sequential assignment of study groups continued until the desired number of study participants had been met. Once group status was assigned, the information was entered by the student investigator into the password protected Excel spreadsheet assigned for storage of study data.

The study participant was scheduled for cardiac arrhythmia ablation procedure based on availability in the electrophysiologist's schedule, the patient's availability and hospital electrophysiology laboratory availability. The procedure was scheduled same day of consent visit to one month from time of consent for participation in this study. New consent for participation in this study would be required if scheduled date was greater than one month from original consent.

Hospitalization time was patient specific. No change in current hospital protocol for management of cardiac ablation patients occurred based on inclusion or exclusion in this study. All atrial fibrillation ablation patients would expect a minimum of an overnight hospitalization. All other cardiac arrhythmia ablation patients were decided on a case by case basis. Time of day

of procedure, level of anesthesia, vascular complications, arrhythmia specific complications, unforeseen complications were taken into account when deciding if patient was discharged same day or remain for further observation.

The study consisted of an evidence- based implementation of a post cardiac arrhythmia ablation education intervention based upon the Project red framework. Project RED (Re-Engineered Discharge) is a research project at Boston University supported by grants from the Agency for Healthcare Research and Quality, the National Institutes of Health, National Heart, Lung, and Blood Institute, Blue Cross Blue Shield Foundation, and the Patient Centered Outcomes Research Institute. The research project aims at enhancing the discharge process, promoting patient safety, and reducing readmissions (Berkowitz, Helfand, Jones, Schreiber, Paasche-Orlow, 2013). Specific outcome measures to be measured by adapting Project RED are reduced hospital readmissions, improved communications with providers, increased knowledge for self-management, and increased patient satisfaction. Project RED notes an expected 2 percentage point reduction in all-cause hospital readmissions with implementation of this program.

All post cardiac arrhythmia ablation procedure patients received current standard of care discharge instructions. Current standard of care consisted of the cardiac ablation patient being discharged by the nurses at the hospital site once the physician had deemed the patient ready for discharge and discharge orders were written for the patient. Paper form of post cardiac ablation discharge instructions were provided to the patient by the discharging nurse at the time of patient discharge. Current standard of care did not include a follow up phone call after the patient has returned home from the ablation procedure or anytime thereafter. All patients continued to receive current standard of care delivered by the nurses performing current standard of care

discharge. Those study participants randomized to the intervention group received the education intervention phone call delivered by the SI utilizing a script (See Appendix G) adapted from the Boston University Project RED toolkit. Permission was obtained from Project Red team member Jessica Martin (see Appendix A). Three (3) phone call attempts were made to reach the intervention patient and did not exceed the 72 hour time frame from discharge. All patients were scheduled for a follow up appointment with the electrophysiologist 1-2 weeks post cardiac ablation procedure.

The education intervention was intended to provide the patient with education, awareness, and reinforcement of post cardiac arrhythmia ablation procedure discharge instructions and when to seek medical attention. The intervention was delivered within 24-72 hours post ablation procedure as this period of time after discharge is when the patient is most vulnerable to adverse events (Forster et al., 2003). The education intervention was delivered via telephone call made by the SI. All phone calls and phone call attempts were documented on the post cardiac arrhythmia ablation discharge follow-up enhanced education intervention phone call log (Appendix F) adapted from the Project Red tool kit. Log of telephone calls were maintained in a password protected document on secure laptop by the SI. If a patient was not available two additional attempts were made within the 72 hour from discharge time frame. If the SI had not been successful at reaching the study participant within the 72 hour time frame, the study participant was dismissed from the study and assigned a code “99” identifying the data as missing. The script addressed the following topics during the intervention call:

- Patient will be educated about his/her diagnosis leading to the cardiac arrhythmia ablation procedure
- SI will assess patient understanding of disease/ procedure

- SI will reinforce medication education and understanding
- SI will educate patient what to expect during the immediate post procedural period up to 30 day post-operative period
- SI will educate patient when to call provider and when to seek immediate medical attention
- SI will reinforce follow up appointment, clarification of date/time/place
- SI will provide appropriate contact numbers for the patient

The supplemental demographic tool (see Appendix E) was also distributed by the student investigator at the follow up visit. All study participants had the survey read to them by the primary investigator to account for reading ability and visual impairment. A translator for the hearing impaired would be contacted and available if the patient was hearing impaired. The completed survey and demographic tool were collected by the SI and maintained in a locked cabinet that only the SI had access to. The electrophysiologist reviewed the script (see Appendix G) and approved for use in this study (see Appendix A).

Readmission was assessed after the 30-day post-operative period was completed by a phone call administered by the SI asking if the patient has been readmitted post ablation procedure following the readmission phone call script (Appendix C). Patient identifiers were stored on one master list, on a locked laptop computer under the care of the SI. Information was maintained on a password protected Excel spreadsheet. Data was coded using a three -digit code that correlated to the number the participant is in the study beginning with 001. Data was collected and stored in a password protected database accessible only to the SI.

No additional funding was required for implementation of this study. Available resources were utilized. Password secured laptop computer was available to the SI and was utilized with no additional fees incurred. No additional staffing resources were required.

Sampling Plan

Participants were identified by the SI at the time of scheduling appointment for consultation or at time of consultation request for in hospital patients. Participants were recruited by the SI after completion of their consultation visit for cardiac ablation. The sample was a non-probability convenience sample of patients referred for consultation for cardiac ablation procedure.

Sample access: The target population for this study were all adult, over the age of 18, patients with cardiac arrhythmias who undergo a cardiac arrhythmia ablation procedure performed in a tertiary care center in the northeastern United States. The accessible population were all adult patients, over the age of 18, with cardiac arrhythmias who were referred to the cardiology center for treatment of their arrhythmia by cardiac arrhythmia ablation. The accessible population was representative subset of the target population. Control for external validity was addressed in this study by presenting all adult patients with cardiac arrhythmias referred for cardiac ablation procedure the opportunity to participate in this study.

Sample Recruitment: Participants were recruited by the student investigator nurse practitioner after completion of their consultation visit for cardiac ablation. All adult patients over age 18 with cardiac arrhythmias referred for cardiac arrhythmia ablation procedure were approached for study participation after completion of the consultation visit with the electrophysiologist in the hospital and office setting. The student investigator (SI), a nurse

practitioner, approached potential participants after the electrophysiologist had reviewed patient data and confirmed necessity of cardiac ablation procedure. The SI proceeded to provide detail about the pilot study to the patient by utilizing the study participant recruitment script (Appendix J) and offered the opportunity for study participation. If the participant volunteered to participate in the study, consent was obtained (Appendix I). Informed consent checklist (Appendix H) was utilized to assure that all items necessary for consent were provided. Refusals and ineligible participant data were maintained on a password protected Excel spreadsheet on password protected laptop by the SI nurse practitioner. No incentive or reward was provided to study participant or researcher electrophysiologist for study participation.

Inclusion/Exclusion Criteria: All study participants were 18 years and older. Subjects 18 years and under were excluded from inclusion in this study. All study participants were English speaking. A sign language communicator would be contacted through translation services if the patient was hearing impaired and would be present. All study participants were diagnosed with a cardiac arrhythmia requiring a cardiac ablation procedure. Repeat ablation patients were not considered for inclusion in this study. All study participants included in the study needed to have the means to attend the required 1-2 week post-cardiac arrhythmia ablation follow up appointment. Potential participants leaving the area permanently prior to 1-2 week post cardiac ablation appointment were excluded from this study.

Setting

The setting selected for this study was a cardiology practice located in the northeastern United States. The cardiology practice consists of one office location and one main hospital campus where the procedures were performed. The study site exists in an urban setting with varying degrees of socioeconomic demographics contributing to preservation of external validity in this pilot study. According to the United States Census Bureau (2013) for this community, 8 different categories of ethnicities are represented, 35.4% are foreign born, 44.9% speak another language home aside from English, 86.4% have a high school degree or greater, 43.6 have a Bachelor's degree, there are 3,954 Veterans, median household income is 76,799 and 11.1% of the population are living below the poverty level. According to the United States Census Bureau (2010), demographic distribution in the community is as follows: (53.5%) White, (23.8%) Hispanic, (13.1%) Black, (7.8%) Asian. This particular cardiology practice performs nearly 100 cardiac arrhythmia ablation procedures yearly on average.

Study Design

This pilot study utilized a single blinded posttest design in which eligible study participants ($N=30$) were randomly assigned to either a control group or intervention group. Additional data regarding insurance status, gender, age, number of comorbidities, primary language spoken, socioeconomic status, marital status, overall health and reported race/ethnicity was also tracked for evaluation of potential impact on patient satisfaction and readmission rates. This design was chosen to examine the effectiveness of the education intervention by utilization of an intervention group and control group to eliminate potential bias. A single blind design was

appropriate for this study as the interventionist needed to know whether to provide enhanced education or to provide a current standard of care to the participants. The student investigator knew the group assignment of the study participant, but the study participant was blinded to which group they were assigned. Randomization of study participants was implemented in this study to provide equal chance for each participant to be categorized into the control group or the intervention group.

Protection of Human Subjects

Prior to commencement of study, student investigator completed CITI (Collaborative Institutional Training Initiative at the University of Miami) training for the protection of human subjects.

The rights of full disclosure and self-determination were achieved in this study by utilization of informed consent. Once the patient was deemed a candidate for cardiac arrhythmia ablation procedure and had consented to the procedure, the SI discussed potential study participation following the study participant recruitment script (Appendix J), with the potential study subject. Informed consent (See Appendix I) was obtained by the SI. Informed consent was obtained during the pre- cardiac ablation consultation. Informed consent checklist See (Appendix H) was completed by SI at time of informed consent to establish continuity of informed consent process.

Patient identifiers were stored on one master list, on a locked laptop computer under the care of the student investigator. Information was maintained on a password protected Excel spreadsheet. Data was coded using the three digit number the participant was in the study and

began with 001. Data was collected and stored in a password protected database accessible only to the SI.

IRB approval was obtained from the University of Connecticut. IRB approval was not necessary from an external IRB source servicing cardiology practice or the hospital following approval by the University of Connecticut IRB, the University of Connecticut's IRB approval sufficed for the cardiology practice (see Appendix A). This is a minimal risk study with a possible perceived inconvenience of time associated with survey completion. The potential benefit was enhanced education and understanding of potential post procedural symptom variants and increased patient confidence in their own knowledge and understanding.

Instruments

National Health Service Adult Inpatient Survey

Permission for adoption and use of the NHS Adult Inpatient Survey was granted by a senior research associate of the National Research Corporation (see Appendix A). The adapted version of the NHS Adult Inpatient survey (appendix B) was completed during the 1-2 week post ablation follow up visit. Questions were read to the study participant by the SI. The survey tool utilized in this study was based on the National Health Service Inpatient Questionnaire. The National Health Service is the primarily publicly funded health service program in England. The core principles of the NHS are based upon the ideal that healthcare needs to be available to all persons without regard to financial means (NHS, 2010). The NHS Inpatient Questionnaire was developed by Care Quality Commission for use in the inpatient setting to assess patient satisfaction with care they received during their admission (NHS, 2015).

Although all cardiac ablation patients are not inpatient status, the questionnaire was chosen as it contains questions directly related to satisfaction with care and had been utilized in a prior study looking at patient satisfaction in the cardiac arrhythmia ablation population. This tool was adapted for purposes of this study to omit questions related to inpatient environmental questions such as room cleanliness.

The NHS survey questions cover the journey of the patient from arrival at the hospital to discharge. For this pilot study, the survey was adapted to include the pre-procedural appointment session. Most of the study questions ask respondents to select one option from a set of pre-defined responses. Patients were also allowed to include their own comments in a section at the end. The survey was scored by assigning numerical value to the answers. A score of zero represents the least desirable outcome indicating satisfaction could be improved. A score of one hundred assigned to an answer option represents the most favorable answer. Where several options exist between negative and positive responses, a numerical value was assigned at equal intervals. The higher the total numerical value, the more positive the results of the survey.

Two open- ended questions were included at the end of the survey to address process data and identify barriers and facilitators. One question asked the participant to describe factors that made it easier for them to understand how to manage at home after discharge (facilitators). The second question asked the participant to address factors that were lacking but if included would have made it easier to understand how to manage at home after discharge (barriers).

Readmission was measured via telephone call performed by the SI after the 30-day discharge post ablation. The SI asked the following questions: Have you experienced any of the following

after your cardiac arrhythmia ablation? Hearing impaired patients would be sent an email or text message containing the readmission question.

- admission to the hospital following discharge after your cardiac arrhythmia ablation procedure
- seen in the emergency department after discharge from your cardiac arrhythmia ablation procedure
- seen in an urgent care setting following discharge from your cardiac arrhythmia ablation procedure
- admission to the hospital as an observation patient following your cardiac arrhythmia ablation procedure

Cardiac Ablation Education Evaluation Form

In addition to the patient satisfaction survey, the study participants who had received the educational intervention were asked to complete the cardiac ablation education evaluation form (Appendix D) to facilitate identification of potential positive attributes of the educational intervention as well as identification of potential areas to improve in further program modification.

Supplemental Patient Demographic Form

The patient demographic form was a supplemental form to be completed by the patient at the time of the 1-2 week post ablation follow up visit (Appendix E). The demographics section included age, ethnicity/race, primary language spoken at home, overall health, grade level completed, marital status, living arrangements, and socioeconomic status. These variables were chosen to account for variation in survey responses due to possible demographic influences.

Treatment of Data

All data was collected and maintained on a secure laptop in a password protected Excel spreadsheet by the student investigator. Management of data was performed utilizing SPSS Version 24 accessed through University of Connecticut Skybox site. Data will be collected by student investigator.

Fidelity to the study protocol was maintained by utilization of an algorithm to follow for each study participant. Missing data was included in the codebook as 99. Missing data was accounted for with the numerical representation of the number 99. The informed consent document, checklist and data collection forms were stored in a locked cabinet that only the SI will have access to. The documents were filed utilizing the three digit code correlating to their participant number beginning with 001. The informed consent forms were scanned into the participant's electronic medical records according to standard operating policy of the facility under the direction of the office of research.

Data Analysis

Analysis of data was performed via SPSS version 24 via University of Connecticut Skybox. Descriptive statistics (means, standard deviations, numbers) were utilized for analysis of demographic information. Chi-square test of independence was calculated for categorical demographic data to explore the relationship between the control group and the intervention group to assess for randomization.

Independent samples T- test was utilized to compare the difference of the mean scores of the control compared to the intervention group total NHS patient satisfaction survey scores.

Effect size was calculated by performing an Eta squared to indicate the magnitude of the difference in scores between the two groups.

A Chi-square test for independence was the test intended to explore the relationship between 30-day readmission rates of the control group compare to the intervention group. Assumptions for the Chi-square were not met, therefore a Fisher's exact probability test was utilized to provide an exact p value rather than an estimated value that would have resulted from the chi-square test of independence.

This pilot study aimed to compare patient satisfaction and 30-day readmission rates between two groups, one receiving the enhanced education intervention and the control group receiving current standard of care. Rejection of the null hypothesis in this study indicates a significant difference between the independent variable (enhanced patient education) and the dependent variables (patient satisfaction and 30-day readmission rate).

Responses to the two open- ended questions on the survey were analyzed by the SI. Each individual response was coded and responses were grouped by similar identified themes. Each theme was further disseminated into categories within the theme for identification of facilitators and barriers.

Summary

This chapter serves as a detailed description of this proposed pilot study. The research questions proposed in this study are:

- 1) What is the effect of a post cardiac arrhythmia ablation enhanced education program on patient satisfaction with care when compared to patient satisfaction with care in sample of post cardiac arrhythmia ablation patients receiving current standard of care.
- 2) What is the effect of a post cardiac arrhythmia ablation enhanced education program on 30-day readmission rate when compared to 30-day readmission rate in sample of post cardiac arrhythmia ablation patients receiving current standard of care.
- 3) What are barriers and facilitators to implementing a cardiac ablation enhanced education program on patient satisfaction and readmission rates in a sample of post cardiac ablation patients.

As the aim of this study was to compare the outcomes of patient satisfaction and 30-day readmission rates with implementation of an enhanced post cardiac arrhythmia ablation education program compared to standard of care, independent t-test was used to compare the mean NHS patient satisfaction scores between the two groups. Effect size was assessed by calculating an Eta squared to indicate the magnitude of the difference between the groups. Chi-square test of independence was intended to be utilized to explore the relationship between the two groups' 30-day readmission rates, however assumptions for the chi-square were not met and a Fisher's exact probability test was performed. Provision of the detailed description of this

study, is intended for utilization in further research projects with similar aims and replication of this study.

CHAPTER 4: Results

Introduction

In this chapter, the results of analysis of the raw data collected during this study are presented. This purpose of this study was to investigate the impact of the implementation of an enhanced post cardiac ablation education program, compared to standard discharge instructions, on patient satisfaction with care and hospital readmission within 30-days post procedure in a northeastern United States cardiology practice. It was hypothesized that implementation of enhanced patient education in the post cardiac arrhythmia ablation population would increase patient satisfaction and decrease the 30-day readmission rate.

The following comparison was made between the standard discharge group and the intervention group receiving enhanced patient education, did implementation of an enhanced education intervention in a post- cardiac arrhythmia ablation population affect patient satisfaction or 30-day readmission rates. Contextual data were analyzed to assess and confirm randomization of the two sample groups.

Description of Sample

The target population for this study was every patient who presented to one northeastern cardiology practice undergoing a cardiac arrhythmia ablation procedure that was already deemed necessary for treatment of their arrhythmia. Thirty- one cardiac arrhythmia ablation patients initially signed consent for participation in the study. All study participants were required to be

18 years or older and English-speaking for inclusion in the study. All participants were diagnosed with a cardiac arrhythmia requiring a cardiac arrhythmia ablation procedure. Study participants were excluded from participation if they were unable to attend the required 1-2 week post- cardiac arrhythmia ablation follow- up appointment or if they were a repeat ablation patient. Three potential study participants were ineligible for participation in the study because one participant was non-English speaking, one was a repeat ablation, and one refused to participate. Two participants did not fully complete the data collection process, where one refused to complete the demographic sheet, and the other did not have a complete set of data (NHS survey score) as the ablation procedure was not able to be performed. The participant is included in the demographics table as per the study protocol, consent for study participation was obtained at the pre-operative office visit and the demographic information was completed at that visit as well.

Of the 30 participants in the sample, the majority were Non-Hispanic (96.8%), with their primary language as English (93.6%). The group was primarily older with 61.3 % aged 66 or older, and well-educated with 74.2% having 2 or more years of college. 35.5% had heart failure as a diagnosis, and 48.4% rated their overall health as very good to excellent. Most lived with a spouse or significant other (71%), and 54% were married or had a significant other. A large number of participants (41.9%) did not report income.

Descriptive analysis of the study group showed mean age of the group was 61.73 years ($SD=11.89$). Mean age of the control group was 59.7 ($SD= 13.72$) and mean age of the intervention group was 63 ($SD= 9.80$). Cross-tabulation was performed to determine the frequency each age occurred in each group and in total. The data from the cross tabulation was utilized for entry into descriptive analysis. Continuous variable data, age was compared using

independent t-test. Comparison of the two groups was accomplished by running an independent samples t-test which showed no statistical difference in age between the two groups ($t = .919$, $p = .366$) (see table 1).

A chi-square analysis examined whether there were any statistically significant differences in categorical data between the two study groups. Income level was included in categorical data analysis as the data was distributed into groups due to the large range of income each set contained. Multiple participants (41.9%) chose not to answer the income level question, analysis was not run in this category due to the insufficient amount of data available for analysis. A Chi-Square test of independence showed no statistically significant difference between groups and highest grade level $X^2 (n=31, p = .379)$ (see table 1). Marital status between groups was compared and Chi-Square analysis showed no statistically significant difference between groups $X^2 (n=31, p = .376)$ (see table 1). Living arrangements between groups was compared using Chi-Square analysis and no statistically significant difference was shown $X^2 (n= 31, p = .609)$ (see table 1). The assumptions were met for the above sample statistics.

The entire study sample, 30 out of 30 participants were non-Hispanic, no difference between groups and all with the exception of one participant claimed English as their primary language.

Table 1

Descriptive Statistics of Study Sample by Treatment Group (N=31)

Demographic Characteristic	Standard	Treatment	%	p-value
	n	n		
Age (years)	15	16	100	**0.366
18-65	5	6	35.5	
66->75	10	9	61.3	
missing	0	1	3.2	
Highest Ed Level (grade)	15	16	100	*0.379
<8-4yr college	8	11	61.3	
>4yr/miss	7	5	38.7	
Marital Status	15	16	100	*0.376
Single/widowed/miss	8	6	45.2	
Married/sig other	7	10	54.8	
Living Arrangements	15	16	100	*0.609
Spouse/sig other/child	10	12	71.0	
Alone/Ast live/LTC/miss	5	4	29.0	

Note.* Chi-Square, ** t-test

Analysis of Research Questions

Effect of a post cardiac arrhythmia ablation enhanced education program on patient satisfaction. The first research question addressed, "What is the effect of a post cardiac arrhythmia ablation enhanced education program on patient satisfaction with care when compared to patient satisfaction with care in sample of post cardiac arrhythmia ablation patients receiving current standard of care?" was answered with independent samples t-test. A total score was calculated for each NHS survey. An independent samples t- test using an alpha level of 0.5 was conducted to compare the patient satisfaction scores between the control group who received current standard of care and the intervention group who received enhanced education intervention. Results of a 2-tailed t-test showed a statistically significant difference in the participants' NHS survey scores between the control group ($M = 508, SD = 137$) and the intervention group ($M = 633, SD = 78$); $t(27) = -3.037, p = .005$ (see table 3). An eta squared was calculated to assess the magnitude of the difference between groups. The proportion of the variance in the dependent variable accounted for by the independent variable was large ($\eta^2 = .756$).

Effect of a post cardiac arrhythmia ablation enhanced education program on 30-day readmission rate. The second research question, "Are those participants receiving standard discharge more likely to be readmitted within 30 days than those receiving the arrhythmia ablation enhanced education program?" was answered using Fisher's exact analysis.

To evaluate each participant for 30-day readmission, each participant was asked to answer yes or no to the following question, "Have you experienced any of the following after your cardiac arrhythmia ablation:

- admitted to the hospital following discharge after your cardiac arrhythmia ablation procedure,
- seen in the emergency department after discharge from your cardiac arrhythmia ablation procedure,
- seen in an urgent care setting following discharge from your cardiac arrhythmia ablation procedure, and
- been admitted to the hospital as an observation patient following your cardiac arrhythmia ablation procedure?”

A chi-square test of independence was planned to compare the frequency of readmissions in the standard discharge group and the enhanced education intervention group. All assumptions for the chi-square test of independence were not met. The value of the cells expected was less than 80%, therefore a Fisher's exact test was performed.

A Fisher's exact test indicated a significant association ($p=.014$) between enhanced patient education and reduced readmission. The control group had a larger percentage 53.3% of readmissions than the intervention group rate of 7.1%.

Barriers and facilitators to implementing a cardiac ablation enhanced education program on patient satisfaction and readmission rates. The third research question addressed, “What are barriers and facilitators to implementing a cardiac ablation enhanced education program on patient satisfaction and readmission rates in a sample of post cardiac ablation patients?” was addressed by asking two open ended questions, “What made you feel prepared to manage on your own after the procedure” and “What would you recommend that would have improved your preparedness to manage on your own at home?”. Of the initial 30 participant

consented, 29 participant completed the answers to these questions as one participant had the ablation procedure cancelled due to the inability to induce an arrhythmia. Answers to the two open ended questions aimed at assessing barriers and facilitators were evaluated by identifying and grouping significant statements into common themes and looking at percentages of responses of both groups of participants. All answers are presented in table 2.

The answers to the following question “What made you feel prepared to manage on your own after the procedure” were asked of participants to assess for barriers to their preparedness to manage on their own at home. Results are presented in table 2.

The answers to the following question “What would you recommend that would have improved you preparedness to manage on your own at home” were asked of participants to assess for facilitators to their ability to manage on their own at home. Results are presented in table 2.

Table 2

Barriers/Facilitators to Management at Home Post Cardiac Ablation Procedure

Significant statement	Group	n	%
Thoroughness, detailed instructions	C	4	26.7
	I	5	35.7
Clearer medication information	C	3	20.0
	I	2	14.3
Phone call	C	1	6.7
	I	8	57.1
Knowing what is normal	C	4	26.7

	I	5	35.7
Need to know exactly what to expect at home	C	5	33.3
	I	5	35.7
Family/ other member present	C	2	13.3
	I	1	7.1
Staff experience	C	0	0.0
	I	2	13.3

Note. C=control group. I= intervention group.

Additional Analysis. Answers to the yes/no questions in the survey were analyzed between groups and answer percentages were calculated to identify possible areas for potential process improvement, results are presented in table 6. Each of the participants responded no written material was provided prior to the cardiac arrhythmia ablation procedure. Post ablation procedure, prior to discharge (93.1%) of participants responded they were aware of the outcome of their procedure yet (82.76%) felt they were not prepared for discharge.

The intervention group was asked to complete an additional questionnaire to evaluate the enhanced education intervention that they received. The purpose of the evaluation was to facilitate identification of potential positive attributes of the educational intervention as well as identification of potential areas to improve in further program modification. The majority of responses (78.4%) indicated that the education intervention provided them the knowledge of when to or not to seek medical attention, provided a better understanding of discharge instructions (71.4%), and understanding what was normal post ablation procedure (71.4%). Responses to the questions are expressed by percentage and presented in table 6.

Program implementation. Enhanced education program was implemented by the SI only. With one provider delivering the intervention, it was difficult to adhere to the time line with delivering the intervention phone call when the date fell on the weekend or holiday. Demographic information was maintained on a password protected Excel spreadsheet on a password protected laptop by the SI which allowed the SI to have access to the information necessary to uphold the timing parameters of the study. All phone calls were made from the secure mobile phone belonging to the SI and phone call logs were deleted from the mobile phone as soon as call was completed. The study size was small enough with sixteen patients scheduled to receive the intervention phone call, that the SI was able to deliver all intervention phone calls within the appropriate time period. Had the sample size been larger, it may prove difficult for one individual to deliver phone calls within the appropriate time period.

Summary

This chapter serves as a detailed description of the data analysis performed for this pilot study. The null hypothesis is rejected in each of the pertinent study questions. Independent samples T-Test shows a statistically significant p value of .005 in comparing the mean patient satisfaction scores between the control group and the intervention group, the enhanced patient education intervention group with higher overall NHS patient satisfaction survey scores. Magnitude of effect produced an eta squared value of 0.756 or 75.6% of the variance in patient satisfaction score is explained by enhanced patient education. A Fisher's exact test produced a statistically significant p value of .014, showing that enhanced cardiac arrhythmia ablation education does significantly affect readmission rates in the cardiac arrhythmia ablation population with the intervention group having a lower readmission rate of 7.1% compared to

53.3% in the control group. Effect of the enhanced education intervention may have prevented unnecessary readmissions and contributed to patients' self-efficacy post cardiac ablation procedure. Findings, conclusions, implications, and future research will be discussed in chapter 5.

Chapter 5: Discussion

Introduction

This chapter presents a discussion of the findings of this pilot study and highlights the application of enhanced patient education in post-operative cardiac ablation patients for reduction in patient satisfaction and 30-day readmission rates. The Health Belief Model (Janz & Becker, 1984) will be discussed as a framework for implementation of enhanced patient education in the post-operative cardiac arrhythmia ablation population. Study limitations, implications for use of this enhanced education program in practice, suggestions for future research, and policy recommendations are addressed.

Discussion of Findings

The purpose of this pilot study was to investigate the impact of the implementation of an enhanced post cardiac ablation education program, compared to standard discharge instructions, on patient satisfaction with care and hospital readmission within 30-days post procedure for a northeastern United States cardiology practice. Findings from this study suggest that enhanced patient education increases patient satisfaction and reduces readmission rates and are consistent with findings supported by the literature.

Study Sample. A total of 30 participants completed the demographic survey. The participants were non-Hispanic, White/Caucasian ethnicity. The majority of participants had 2 year college degree or greater (74.2%), were aged 65 years or greater (63%), and lived with spouse or significant other (71%). The homogenous characteristics of the study sample were not representative of the community in which the cardiology practice resides. The practice exists in an urban setting and according to United States census statistics (2010), (53.3%) of population is

white, (23.8%) Hispanic, (13.1% black, and (7.8%) Asian. The noted discrepancy in representative population may suggest variation in referral to specialty practices based on race.

Patient Satisfaction and cardiac ablation procedures. Although atrial fibrillation ablation is a common procedure, little research data exists in this population assessing patient satisfaction after the procedure (Ezzat et al, 2013). Ezzat et al (2013) carried out a study to assess patient satisfaction post atrial fibrillation ablation procedure utilizing the NHS Adult Inpatient Survey. Results from the NHS survey in the study show patient dissatisfaction status post cardiac arrhythmia ablation procedure is often the result of unmet expectations as well as patient experienced and perceived negative post procedural outcomes. This study exemplifies use of the NHS scale in this study population.

Press Ganey scores for the practice site where the pilot study took place were reviewed prior to commencement of the study and revealed that areas cardiac ablation patients expressed the least satisfaction were: a) discharge readiness, b) how to respond to symptoms after discharge, and c) deficit in instructions on how to care for themselves at home. Each of these items can be addressed by improved patient education programs but as noted in a study by Wolber et al (2010), further research is needed to target factors impacting patient satisfaction in this patient population.

Patient education and patient satisfaction.

Patient satisfaction with healthcare delivery has become a consistently measured parameter in our health care system (Guss, Leland, &Castillo, 2013) and is an indicator of quality patient care as high quality patient care is associated with improved outcome (Kupfer& Bond, 2012). Prior to commencement of this pilot study, patient satisfaction scores were

reviewed for the practice where the study took place and revealed one area of dissatisfaction was related to the instruction the patient received on how to care for themselves at home. Inadequate education has been shown to negatively affect patient satisfaction and Murdock & Griffin (2013) showed a link between implementation of successful patient education programs and improvement in patient satisfaction scores.

The patient satisfaction score that was reviewed prior to commencement of the study was the Press Ganey score. Press Ganey score surveys are often utilized in healthcare facilities to assess patient satisfaction. A study by Guss, Lelan, & Castillo looked at the “likelihood to recommend” question within the Press Ganey score in their sample population as the measurement of satisfaction. The patients were randomized into a control group with no phone call and an intervention group receiving a follow up telephone call after discharge from the emergency department. Results of the study showed that (89%) of the intervention group answered “yes” to the likely to recommend question compare to (55.6%) “yes” in the control group who did not receive the phone call. Braun, Alroy, & Azzam (2009) performed a study that utilized a series of educational phone calls over a specified time period with the result being a statistically significant ($p=.02$) improvement in patient satisfaction in the group receiving the phone calls. Findings from this study support implementation of discharge follow up educational phone call to improve patient satisfaction. Results of this pilot study in the post cardiac arrhythmia ablation population support these reported studies. Enhanced patient education improved patient satisfaction producing a statistically significant difference between groups ($p = .005$).

Effect of a post cardiac arrhythmia ablation enhanced education program on patient satisfaction. The enhanced patient education delivered to post cardiac arrhythmia ablation

patients was effective at increasing patient satisfaction based on the higher value scores on the NHS patient satisfaction survey in the treatment group who received the educational intervention. The increase in patient satisfaction score with the educational intervention was significant ($p = .005$), with the control group total mean score ($M = 508$, $SD = 137$) compared to the intervention group total mean score ($M = 633$, $SD = 78$). A significant magnitude of difference exists between the two groups indicating that the increase in patient satisfaction score was influenced by the implementation of enhanced patient education. Demographic analysis of the two groups showed that sample characteristics did not differ significantly between the two groups indicating randomization was achieved and that sample characteristics were not a factor in the difference with the total NHS patient satisfaction scores. Based on nursing observations of patient lack of post-operative knowledge despite having received discharge instructions, Lo, Stuenkel, & Rodriguez, (2009) study results showed that post implementation of patients receiving diagnosis specific discharge instructions, the patient satisfaction rate increased. This study shows that diagnosis specific discharge instruction positively impacts patient satisfaction which is a measure of quality of care. These findings support knowledge described in the literature that successful patient education interventions such as this, are linked to higher rates of patient satisfaction.

The findings from this pilot study are consistent with findings found in the literature and support implementation of enhanced patient education programs to improve patient satisfaction.

Patient satisfaction and hospital readmission.

Medicare spends >17 billion dollars annually for all cause readmissions with an estimated 75% of 30-day readmissions deemed preventable (James, 2013). Inadequate patient education has

negatively impacted patient satisfaction, hospital reimbursement, and readmission while successful patient education programs have been linked with improvement in patient satisfaction scores (Murdock & Griffin, 2013). Literature supports increase in patient satisfaction scores correlate to lower rates of 30-day readmissions (Boulding, Glickman, Manary, Schilman, & Staelin, 2011). Nursing has the opportunity to improve patient satisfaction, outcomes, & potentially reduce 30-day readmission rates by implementation of improved teaching techniques post-discharge (Alberti & Nannini, 2013). The literature supports implementation an enhanced education of such a program in the post cardiac arrhythmia ablation procedure population.

Patient education and hospital readmission. The first few months following cardiac arrhythmia ablation are termed the “blanking period”. During this time period, short recurrence of the arrhythmia can be considered a normal variant (Darkner et al., 2014). When patients are not aware of the possibility of this normal variant, they may seek unnecessary treatment and hospital readmission (Ezzat et al, 2013). Readmission rates post cardiac ablation continue to be a cause of hospital readmission rates and are typically related to postoperative complications and arrhythmia recurrence (Shah et al, 2012). Literature has shown that implementation of a post-procedural enhanced education program provides the patient with education necessary to make a decision when to seek medical treatment which results in a decrease in the 30-day readmission rate. The literature supports implementation of such a program in the post cardiac arrhythmia ablation procedure population.

Effect of a post cardiac arrhythmia ablation enhanced education program on 30-day readmission rates. . The enhanced patient education delivered to post cardiac arrhythmia ablation patients, in this pilot study, improved 30-day readmission rates post cardiac arrhythmia ablation procedure based on the significantly lower 30-day readmission rate in the intervention

group compared to the control group who did not receive the educational intervention. This pilot study supports findings in the literature that had shown a reduction in 30- day post- surgical readmission rates with implementation of increased patient education (Hinami, 2014). Support for use of the phone call as method for delivering the enhanced education intervention evolved from studies showing that the most vulnerable period post-operatively for readmission is 24-72 hours after discharge (Hinami, 2014) and that implementation of a phone call during this time period to assess patients' knowledge and needs during this acute discharge period can prevent unnecessary readmissions (Naylor, et al, 2011). Based on results of this pilot study, it is evident that implementation of an enhanced education program 24- 72 hours post cardiac arrhythmia ablation procedure reduces the number of unnecessary post- operative 30-day readmissions.

Barriers and facilitators. This section discusses barriers and facilitators to study participants managing their care at home were identified from the responses to the two open ended questions.

- 1) What made you feel prepared to manage on your own after the procedure?
- 2) What would you recommend that would have improved you preparedness to manage on your own at home?

In a study by Awad & Chung (2006), improving patient understanding of their disease, potential post-procedure complications, and medication knowledge are important factors for safely discharging patients. In this study, detailed discharge instructions and clear medication information were among the most frequent responses provided by participants indicating that detailed discharge instructions and clear medication information, when delivered, are facilitators to patient satisfaction, education, and unnecessary readmission. This response from participants also indicates that conversely, the absence of detailed discharge instructions and clear medication

information pose barriers that may lead to decreased patient satisfaction and higher likelihood of readmission.

A large percentage of respondents in control and intervention groups, (33.3%) and (35.7%) respectively, indicated knowing what to expect post procedure was a as a facilitator and not knowing what to expect was a barrier. Expectations may not be apparent until the patient has returned home (Kazuare, Roman, & Sosa, 2012) and at that point, patients may not feel prepared to make decisions on whether or not to seek medical treatment during this vulnerable period of time (Jencks, Williams, & Coleman 2009). Jean-Pierre et al (2011) describe findings from a study that was initially intended to assess whether timing of patient education affected patient satisfaction. Although no statistically significant finding was noted with timing of the education and satisfaction, what was noted was that patients reported dissatisfaction with the lack of education provided regarding adverse effects of treatment and hope to manage symptoms at home. This study suggests that patient education focused on adverse effects and how to manage these symptoms at home may improve patient satisfaction. Of the participants in this study, two of the participants specifically stated that had they not received the intervention phone call discussing what to expect, they would have proceeded to the emergency room out of concern for their symptoms, one participant in the control group had responded that he wished he had known what to expect as he would not have proceeded to seek treatment for a symptom that he learned was a normal variant of the procedure. Of the responses in each group, (26.7%) of the control group and (35.7%) intervention group specifically reported knowing what was normal as a facilitator and not knowing normal variants as barrier. The findings of this pilot study support the implementation of a post discharge education plan aimed at increasing patient knowledge of expectations after discharge, normal variants post- procedure and clear medication.

Findings in this pilot study were consistent with the literature, supporting the finding that post surgical patients have exhibited a significant need for enhanced discharge education related to home care, medications and potential complications (Uzun, Ucuzal, & Inan, 2011). Lack of thoroughness of information regarding self- care at home and detail of the discharge instructions was noted as a significant barrier in both the control and intervention group, (26.7%) and (35.7%) respectively. In addition, despite literature stating that staff experience is the best predictor of patient experience (Churchill & Warden, 2014), staff experience was not a frequently reported barrier or facilitator in the control or intervention group with response values of (0.0% and (13.3%) respectively.

Additional Analysis. Analysis of yes/no questions aimed at process improvement revealed that despite receiving discharge instructions in the hospital post procedure and prior to discharge, the vast majority of patients in both the control group and intervention group responded that they did not feel ready for discharge with (85.71%) and (80.0%) respectively, responding “No”. This pilot study incorporated a post discharge enhanced education phone call intervention delivered by the SI at 24-72 hours post cardiac arrhythmia ablation. The intervention was developed utilizing the Project Red framework for reengineered discharge instruction as a template as this framework aims at reducing readmissions and increasing patient satisfaction through improving the discharge process (Jack, et al, 2009). The analysis of this particular question implies that it is likely necessary to not only implement an enhanced education intervention during the vulnerable post discharge period but to also provide patients with disease/procedure specific discharge instructions at the time of discharge.

Despite all (100%) of the patients having a consultation with the physician prior to the cardiac ablation procedure, nearly all (96.55%) stating that they had no unanswered

questions prior to the procedure, and (86%) responding that they felt prepared for the procedure, analysis of procedural expectation revealed that both control and intervention groups consisted of patients that felt the experience in the interventional cardiology lab was not what they had expected (28.57%) and (26.67%) respectively. These findings are consistent with results from a study published by Ezzat et al (2013) with (99%) of the patients surveyed responding that they felt prepared at the time of the procedure yet (31%) reported that the ablation procedure was not what they had expected. The results suggest improved post- procedural communication aimed at improving post-procedural expectations.

Evaluation of Theoretical Framework

A proactive approach toward the primary aims of this study, increasing patient satisfaction and reducing 30-day readmission after cardiac arrhythmia ablation procedure, can be accomplished by incorporating constructs of the Health Belief Model. Four main constructs exist with the Health Belief Model and have the potential to be affected by enhanced patient education. Perceived seriousness, perceived susceptibility, perceived benefits, and perceived barriers. In addition to the constructs, cues to action and self-efficacy are suggested to influence patient behaviors. The educational intervention carried out in this study impacts on these constructs to alter patients' beliefs, attitudes, and actions towards their level of satisfaction and tendency toward unnecessary readmission.

As described by Janz & Becker (1984), patient's perceived seriousness of their illness or condition is based on their knowledge, information, or beliefs about their condition or illness. By incorporating enhanced education and providing necessary knowledge, this may influence the patients' perception of the seriousness of their illness or condition and encourage their compliance and acceptance with post-operative instructions. Patients' perceived susceptibility is

affected by incorporating enhanced patient education. Patients have the potential to possess a clear understanding of what are the normal variants post-operatively, therefore, have an improved perception of their perceived risk based on how they are feeling and the knowledge they have been given. By having a clear understanding of normal variants post cardiac arrhythmia ablation procedure, patients have perceived benefits of having more insight into their condition and options, and may have improved decision making skills based on this enhanced education. It is anticipated that this benefit will lead to an increase in satisfaction, improved self-efficacy and confidence in their condition, resulting in a decrease in 30-day readmission rates. The effects of enhanced patient education on patient barriers is anticipated to improve deficits in knowledge on what to expect post- procedure, and improve understanding on when it is necessary to seek medical attention, who to call, and about medications. As described by Janz & Becker (1984) the cue to action provides the patient with the strategy to activate and address the perceived problem. The enhanced patient education intervention serves as cue to action for this project, and through this enhanced education, the patient achieves a higher level of self-efficacy, with new knowledge to act on their condition with improved confidence for decisions on when to seek medical attention. An example of successful utilization of the theoretical framework and in particular cue to action leading patient to a level of self-efficacy is described by a participant from the control group responding that had they received a phone call explaining the normal variants of the procedure they would not have proceeded to the emergency department, this readmission was avoidable. A second patient clearly stated that they were thankful that they had received the educational phone call as the education provided the patient with the knowledge necessary to make an informed decision regarding when to or not to seek medical attention, therefore, avoiding an unnecessary re-admission.

Limitations

Although findings from this study show statistically significant improvement in both patient satisfaction and 30-day readmission rates in the cardiac arrhythmia ablation patient population who received the enhanced education, the demographic sample in the study was not representative of the demographic distribution of the community where the study took place. The study group consisted of 29 white/Caucasian, non-Hispanic participants. Demographic data retrieved from the 2010 United States Census supports the statement that this study sample was not representative of the community. Demographic distribution of the community is White (53.3%), Hispanic (23.8%), Black (13.1%), Asian (7.8%). Hospitalization rates for atrial fibrillation in Medicare beneficiaries aged 65 and older for the state in which the study took place are amongst the highest in the nation according to the Centers for Disease Control 2007-2012 statistics, however, there is a noted disconnect between the ethnic distribution of reported atrial fibrillation and the ethnic distribution of atrial fibrillation. It is possible that blacks might actually have a higher prevalence of atrial fibrillation than reported (Soliman, Prineas, Case, Zhang, & Goff, 2009). The Hispanic population has a higher risk of recurrent stroke than non-Hispanic Whites, yet reporting of prevalence of atrial fibrillation in this population may be underestimated (Simpson et al., 2010). The facility in which this pilot study took place averages nearly one hundred cardiac arrhythmia ablation procedures per year, however, a limitation in baseline data for this study is not being aware of the number of total ablations by race. Every patient who presented in this cardiology practice was offered to participate in this study, therefore, there may be a disparity with the racial distribution of those presenting for this procedure at this study site.

It is noted, that patients from this community may have been treated elsewhere for cardiac arrhythmia ablation, therefore, were not included in this study. Using multiple sites would increase the generalizability to the population and strengthen external validity of the study. Future researchers should aim to include patients from surrounding facilities to obtain a more representative sample of racial groups from the community. In addition, the small number of participants and the homogenous makeup of the sample in this pilot study was a limitation. A larger sample size would likely have provided a better representation of the distribution of the population and provided for more generalizability of the results.

Time constraints for this particular study were a limiting factor. As this pilot study was developed as a study for doctoral dissertation, a time line for completion was to be adhered to. If a more open ended duration was possible, the number of participants would have been larger, possibly increasing the power of the study.

Lack of prior research of enhanced patient education and its relationship to patient satisfaction and 30-day readmission rates in the cardiac arrhythmia ablation population was a limiting factor for this research, requiring the modification and development of the specific enhanced patient education used for this pilot, without the benefit of previous testing of the intervention for comparison of the findings.

Although the uniformity of a single provider performing the study was a benefit, this also made the logistics of program implementation difficult. Delivery of the intervention in the specified time period is critical for success of the program, and with only one provider, the number of potential participants could be limited to the availability of a the single provider. .

Establishing a team of providers to implement the program, could provide further researchers with a larger sample size.

A further limitation was the lack of a scale to measure patient expectations. This may have provided further detail regarding barriers and facilitators of the enhanced education program. Study participants had noted in their responses, that unmet expectations were a barrier. Improving the description and measurement of those expectations, lacking in this study, would serve to provide more detailed information on the needs of the participants and this population, leading to an improved enhanced education program in the future.

Utilization of Findings

The majority of unnecessary post- operative readmissions occur within the first 24-72 hours after discharge post procedure and are often avoidable (Hinami et al, 2014). Post operative patient populations have been shown to benefit from post operative enhanced patient education delivered within this critical 24- 72 hour post discharge time period (vanWalraven et al, 2011). Despite this evidence based knowledge, post-operative enhanced instruction is not standard practice in all post-operative populations at all institutions. Lack of knowledge of disease and treatment, unmet expectations, lack of knowledge of medications and when to or not to seek medical attention have been noted in the literature (Hinami et al, 2014) and evidenced in this pilot study. Implications of the implementation of this redesigned discharge process inclusive of enhanced education shows promise toward improving patient outcomes, patient satisfaction, and reducing readmissions rates as was observed with Project Red (Jack et al, 2009). The findings

from this study may be expanded to other areas outside of the cardiac arrhythmia ablation procedure population.

Implementation of an enhanced education program has shown a significant positive outcome of increased patient satisfaction and reduced 30-day readmission rate. This type of program has the potential for application to any where patients are discharged . Integration of this type of program may be adapted to any patient population and serve to provide a source of improved patient outcomes and may lead to higher institutional reimbursement based on current reimbursement strategies.

Implications for Further Studies

This study has shown statistically significant improvement in both patient satisfaction and 30-day readmission rates with enhanced patient education in the cardiac arrhythmia ablation population. It would be worthwhile to repeat the study with a larger sample size to verify the effect of the intervention is reproducible. It would also be beneficial to modify and study this intervention for other procedures and intervention discharge processes.

It was evident from this pilot study that race demographic characteristics of the study sample was not representative of the community demographics where the study took place. To date, no analysis in this particular practice has been performed quantifying the patient population of this specialty practice by race. No analysis has been performed quantifying patients referred to this particular practice for cardiac arrhythmia ablation procedures. Although the majority of the community noted in the United States Census 2010 consists of a white majority population, black, Hispanic, and Asian comprise nearly (50%) of the population. The lack of diversity in the participants of this study was an incidental finding warranting further research. Suggestions for

further research include studying the difference in referral practice by general cardiologists and primary care physicians to specialty electrophysiology practices. This type of study could be further disseminated into studying the referral practices to all specialty practices to assess whether a variation exists based on race. Mukamel, Weimer, and Mushlin (2006) performed a study looking at racial disparities with referral to high quality cardiac surgeons. The study found that black patients were often referred to lower quality cardiac surgeons. Several pathways were identified however the study implies that further research is needed to minimize these disparities. Results from a retrospective cohort study evaluating frequency of atrial fibrillation ablation based on demographic characteristics by Kummer et al.(2015) found that white men were most likely to undergo atrial fibrillation ablations. Multiple confounding factors existed in the study, however implies further studies are necessary to investigate the root of the disparity. This pilot study suggests that racial disparity may exist in the referral practice for cardiac arrhythmia ablation procedures and further research is needed.

Evaluation of qualitative responses showed a number of participants were displeased or uncertain of self-management at home due to not knowing what to expect. A Pre and Post test study utilizing a tool that will measure patient expectation, implementing an education program then reassessing if patient expectations were met may serve to guide research as to what patients in regards to knowing what to expect.

Each of the study participants received standard of care discharge instructions prior to discharge after the cardiac arrhythmia ablation procedure. Despite receiving the instructions participants responded that they did not know how to manage on their own at home. Identifying patients as high risk for readmission and providing those identified as high risk with necessary resources for successful transition aims to reduce rate of avoidable readmissions (Donze et al.,

2016). One particular tool, the HOSPITAL score is an assessment tool utilized to identify patients at high risk of avoidable 30-day readmission. Would utilization of an assessment tool, for instance, HOSPITAL score, prior to discharge to identify patients at high risk for 30-day readmission and providing necessary resources for their transition reduce the rate of 30-day readmission?

Implications for Practice. Nursing has the opportunity to utilize this knowledge to implement enhanced education programs tailored specifically to address the patients' particular diagnosis and treatment, medication instructions, normal variants post procedure to improve self-efficacy, provide the patient the necessary knowledge to know when to seek medical attention and potentially avoid unnecessary readmissions and increase patient satisfaction. Adaptation of an enhanced education program into practice could reduce the burden of unnecessary readmissions on the healthcare system and patients alike.

Implications for Policy. This pilot study suggests that racial disparity may exist in referral practices for cardiac arrhythmia ablation procedures and further research is suggested in that area. If further studies show these disparities do exist, policy change will need to be implemented to provide access to care to all those in need without regard to race.

Patient satisfaction and re-admission are strong outcome indicators for healthcare quality and have implications as payment for healthcare models are changing and moving toward quality indicators. Higher patient satisfaction contributes to our ability to provide high quality patient care and is associated with improved outcomes (Kupfer & Bond, 2012). This pilot study has supported adoption of policies that include implementation of an enhanced education program to increase patient satisfaction, reduce 30-day readmission and ultimately result in higher levels of

reimbursement for the institution and an overall reduction in costs attributed to avoidable readmissions.

Implications for Education Implementation of an enhanced patient education program during the vulnerable discharge period has been shown in this pilot study to improve patient satisfaction scores and reduce 30-day readmission rates. Staff education aimed at educating staff on the process necessary for successful implementation and sustainability of the program is needed. As this pilot study provides a source of evidence on which to base practice, it is important to realize that interdisciplinary collaboration is a major component to implementation of evidence-based practice. As described by Doyle, Newhouse, Flora, & Burkett (2014) and Freeth, et al (2009) an interdisciplinary education approach results in improved patient outcomes. This approach to education may serve to strengthen the probability for success of implementation of an enhanced patient education program.

Summary

This chapter serves as a discussion of the findings, evaluation, limitations, and implications of this pilot study. Implementation of an enhanced patient education intervention in the post cardiac arrhythmia ablation procedure resulted in increased patient satisfaction and reduced patient readmission rates which were the primary aims of this study. The small scale of the study is a limitation of the study, however the positive results from this study encourage replication of this study on a larger scale. Additional areas of research generated from analysis of this study have identified possible racial disparities in referral practices to specialty providers and warrants further investigation.

Conclusion

Ineffective patient education in the post- operative population results in a decrease in patient satisfaction and an increase in the frequency of unnecessary readmissions. Despite extensive representation of this knowledge supported in current literature, post- operative patient discharge practice does not always implement evidence based programs aimed at improving the knowledge that patients are provided upon discharge. Despite the knowledge that 24- 72 hours post operatively is a critical education period to improve patient outcomes, increase satisfaction, and reduce unnecessary readmissions, not every patient will receive the necessary enhanced knowledge postoperatively. This lack of education leaves the patient to assume normal post procedural variants, proper medication administration, not knowing what to expect and how to manage on their own. Without this education, they are inhibited in pursuit of self-efficacy and knowledge required to make appropriate decisions on when it is necessary to seek care. Utilizing the Health Belief Model as a framework and the Project Red (Re-Engineered Discharge) program as a guide to develop an educational framework, this pilot study consisted of implementation of an enhanced education intervention post cardiac arrhythmia ablation aimed at increasing patient satisfaction and reducing readmission rates. This pilot study investigated the impact of implementation of an enhanced education program in the post cardiac arrhythmia ablation population compared to standard discharge instructions on patient satisfaction and 30-day readmission rates. The premise for performing this study in this particular population was evaluation of past patient Press Ganey scores from 2014 indicating dissatisfaction in areas related to discharge readiness, how to respond to symptoms after discharge, how to care for themselves at home after discharge and the 30-day readmission rate of 28.57%. Evidence in the

literature supports implementation of this study as studies have shown clear improvement in these measures with enhanced patient education post operatively.

Results of this study support the implementation of an enhanced cardiac arrhythmia patient education intervention as noted by the significantly higher patient satisfaction score and lower readmission rates in the intervention group. Limitations of this study include a small sample size, a homogenous sample that is not representative of the community at large, time constraints, and lack of sufficient prior research in this particular patient population. Indications for future research include further investigation into referral practices of providers to specialty practices such as electrophysiology and whether these referral practices differ with various races/ethnicities. Performing this study on a larger scale and without time constraints may serve to produce data generalizable to the post-operative population at large. Enhanced post-operative education, such as the program delivered in this pilot study, are evidence based strategies shown to improve patient satisfaction and reduce 30-day readmission rates.

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Table 4

Independent Samples T-test Total NHS Survey Scores Between Groups

	F	Sig	T	df	Sig.(2-tailed)	Mean Difference	Std Error Difference
Equal variances assumed	3.770	.063	-3.037	27	.005	-125.18	41.21

Table 5

Chi -square Test of Independence Readmission Rates

	Df	Significance (2-sided)
Pearson Chi-Square	1	.007

Note.

Table 6

Response to Yes/No Questions to Assess Potential Areas for Process Improvement

Question	Percentage of Control Group	Percentage of Control group	Percent of total subjects
Were you seen by a doctor as an outpatient to discuss your condition and planned ablation	No= 0 Yes = 100	No=0 Yes --=100%	No = 0 Yes =100

procedure			
Were you provided with written info before the ablation?	No= 100	No =100	No = 100
	Yes = 0	Yes = 0	Yes = 0
Did you have any unanswered questions about the procedure prior to hospitalization?	No = 100	No = 93.33	No = 96.55
	Yes = 0	Yes = 6.67	Yes = 3.45
Were you told before the ablation that more than one ablation may be necessary?	No = 35.71	No =66.67	No = 51.72
	Yes = 64.29	Yes = 33.33	Yes = 48.28
Did you have the opportunity to ask questions?	No = 35.71	No = 6.67	No = 20.69
	Yes = 64.29	Yes = 93.33	Yes = 79.31
Did you feel you were prepared for the procedure?	No = 21.43	No = 0	No = 10.34
	Yes = 78.57	Yes =100	Yes = 89.66
Was your experience in the cath lab what you had expected?	No = 28.57	No = 26.67	No = 27.59
	Yes = 71.43	Yes = 73.33	Yes = 72.41
After the procedure did a member of the cath lab staff explain what had happened during the procedure in	No = 14.29	No = 40.00	No = 27.59
	Yes = 85.71	Yes = 60.00	Yes = 72.41

terms you could understand?			
On leaving the hospital, were you aware of the outcome of the procedure?	No = 7.14	No = 6.67	No = 6.90
	Yes = 92.86	Yes = 93.33	Yes = 93.10
Did you feel prepared for discharge upon leaving the hospital?	No = 85.71	No = 80.00	No = 82.76
	Yes = 14.29	Yes = 20.00	Yes = 17.24
Did you have complications as a result of your procedure?	No = 78.57	No = 86.67	No = 82.76
	Yes = 21.43	Yes = 13.33	Yes = 17.24
Have you been told that you need a further ablation?	No = 92.86	No = 100	No = 96.55
	Yes = 7.14	Yes = 0	Yes = 3.45
Would you recommend this hospital for an ablation procedure?	No = 0	No = 0	No = 0
	Yes = 100	Yes = 100	Yes = 100

Table 7

Enhanced Patient Education Evaluation Responses

Significant statement	n	%
When to (or not to) seek medical attention	11	78.6
Better understanding of discharge instructions	10	71.4
Understanding of what was normal	10	71.4
After phone call, knew what to look/watch for	7	50.0
Detailed info of what to expect in days after procedure	5	35.7
Reassuring	4	28.6
Opportunity to ask more ?/ share experience	3	21.4

APPENDIX A

Email for Permission from Authors

Subject: permission to use NHS patient satisfaction survey

Bott, Kristin

|

To:

Rory Corbett <rory.corbett@PickerEurope.ac.uk>;

...

Tue 9/29/2015 10:11 PM

Dear Rory,

I am currently a student in the Doctor of Nursing Practice program at the University of Connecticut in the United States. My dissertation is focused on patient satisfaction and 30 day readmission rates post cardiac ablation procedure with the implementation of a post ablation education program. May I have permission to adapt the NHS inpatient survey for use in this study.

Thank you for your time.

Best Regards,

Kristin Bott

From: Sarah Fryda <SFryda@nationalresearch.com>
Sent: Thursday, October 1, 2015 1:09 PM
To: Bott, Kristin
Subject: RE: survey adaption and use in dissertation

Hi Kristin,

Your request to use the NHS adult survey (or any portion of it) is approved. We just ask that you reference our instrument and provide us with a copy of any publication.

Thanks!
Sarah

Sarah Fryda, MS, *Senior Research Associate*
National Research Corporation
p. 800.388.4264 | f. 402.475.9061
nationalresearch.com



April 28, 2016

To: University of Connecticut Institutional Review Board

From: Suzanne Rose, PhD, Director Office of Research

Subject: Local Institutional Review Board Waiver of Review, Kristin A. Bott MS, ACNP-BC, APRN

Dear Institutional Review Board Administrator,

It is the policy of Stamford Hospital to allow the use of external Institutional Review Boards for the purpose of reviewing research studies. When such external board is utilized to review research,

Stamford Hospital does not require a second approval by their Institutional Review Board on record.

The Office of Research has provided a careful review of the prospective randomized research study entitled "Effect of Enhanced Patient Education on Patient Satisfaction and 30-Day Readmission Rates after Cardiac Arrhythmia Ablation" and approves of this study being reviewed the University of Connecticut Institutional Review Board

Please provide documentation of board approval to Kristin Bott MS, ACPN-BS, APRN and myself via mail or through email. Please feel free to contact me with any questions at (203) 276-7866 or by email at srose@stamhealth.org.

Sincerely,

Suzanne Rose, MS, PhD, CCRC

Director Office of Research

Stamford Hospital

One Hospital Plaza

Subject: Use of Project RED telephone script

Bott, Kristin
Wed 5/6/2015 8:36 PM
To:
Jessica.martin@bmc.org;

Dear Jessica,

My name is Kristin Bott and I am a Doctor of Nursing Practice student at the University of Connecticut. I am beginning my journey of a study proposal that involves implementation of a post procedural telephone follow up enhanced patient education intervention aimed at reducing 30 day readmission and increasing patient satisfaction. I would like to request permission to utilize the follow up phone call guideline/ framework provided on the Project RED website as a tool to guide me in developing a script for my proposed study project. May I have permission to do so?

Thank you very much for your time.

Regards

Kristin Bott

Use of Project RED telephone script

Martin, Jessica <Jessica.Martin@bmc.org>
Thu 5/7/2015 8:39 AM
To:
Bott, Kristin;
Dear Kristin,

Thank you for your email and interest in Project RED.

Yes, you are absolutely allowed to use the phone screen script in it's entirety and also modify as needed. We only request that you credit our work in any publications and presentations.

Best,
Jessica

Permission to use adapted version of Health Belief Model Diagram



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Book: Health Behavior and Health Education: Theory, Research, and Practice, 4th Edition
Author: Karen Glanz (Editor), Barbara K. Rimer (Editor), K. Viswanath (Editor)
Publisher: John Wiley and Sons
Date: Sep 1, 2008
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Stamford Health Medical Group Cardiac Electrophysiology

Dr. Sandhya Dhruvakumar Director of Electrophysiology

203-276-2321

To whom it may concern,

I have discussed the proposed pilot study involving enhanced education for post cardiac ablation patients with Kristin Bott and consent to allowing the study to be performed with our practice patient population. I have reviewed the enhanced education intervention and approve its use in this study.

I look forward to implementation of this study.

Best regards,

5/11/2016

 Sandhya Dhruvakumar

Sandhya Dhruvakumar

MD,FACC

Signed by: Dhruvakumar, Sandhya

Sandhya Dhruvakumar

APPENDIX B

Patient Satisfaction Survey Tool adapted from the NHS Adult Inpatient Satisfaction Survey

Prior to Cardiac Ablation Procedure

- 1) Were you seen as an outpatient by a doctor to discuss your condition and planned ablation procedure? YES/NO**
- 2) Did the doctor explain what would be done during the ablation procedure?**
 - a. Yes – completely**
 - b. Yes- to some extent**
 - c. No**
- 3) During the clinic appointment before ablation procedure, were you told how you could expect to feel after you had the ablation procedure?**
 - a. Yes- completely**
 - b. Yes- to some extent**
 - c. No**
- 4) Were you provided with written information before the ablation procedure?**
YES/NO
- 5) At your pre-ablation appointment, did the doctor or nurse explain what would be done during the procedure?**
 - a. Yes- completely**
 - b. Yes-To some extent**
 - c. No**

- 6) Did you have any unanswered questions about the procedure prior to your hospitalization? YES/NO**

In the pre ablation unit

- 7) Were you told before the ablation that more than one ablation may be necessary? YES/NO**

- 8) If you were seen in outpatient clinic by a doctor, how would you rate the experience?**

- a. Poor**
- b. Fair**
- c. Satisfactory**
- d. Good**
- e. Excellent**
- f. Not applicable**

- 9) Did you have an opportunity to ask remaining questions? YES/NO**

In the cath lab

- 10) Did you feel prepared for the procedure? YES/NO**

- 11) Was your experience in the cath lab what you had expected? YES/NO**

After the ablation procedure

- 12) After the procedure did a member of the cath lab staff explain what had happened during the procedure in terms you could understand?**

- 13) On leaving the hospital, were you aware of the outcome of the procedure? YES/NO**

14) Did you feel the discharge arrangements were

- a. Very disorganized**
- b. A little disorganized**
- c. Organized**
- d. Very organized**

15) Did you feel ready for discharge upon leaving the hospital? YES/NO

16) On leaving the hospital how satisfied were you with your experience?

- a. Not at all**
- b. Not very**
- c. Neither satisfied or dissatisfied**
- d. Quite satisfied**
- e. Very satisfied**

Since leaving the hospital

17) Since having your ablation have you felt:

- a. Better**
- b. The same**
- c. Worse**

18) Did you have complications as a result of your procedure? YES/NO

19) Have you been told that you need a further ablation? YES/NO

20) Would you recommend this hospital to others for an ablation procedure? YES/NO

APPENDIX C

Readmission Phone Call Script

Have you experienced any of the following after your cardiac arrhythmia ablation?

- admitted to the hospital following discharge after your cardiac arrhythmia ablation procedure
- seen in the emergency department after discharge from your cardiac arrhythmia ablation procedure
- seen in an urgent care setting following discharge from you cardiac arrhythmia ablation procedure
- been admitted to the hospital as an observation patient following you cardiac arrhythmia ablation procedure

APPENDIX D

Cardiac Ablation Education Evaluation Form

How did you feel about the education information presented to you as you recovered from your surgery?

What is helpful?

In what way?

If not, why not?

Describe your experience of receiving education information over the phone.

APPENDIX E

Supplemental Demographic Section

- 1) What is the highest grade or level of school that you have completed?
 - ☐ 8th grade or less
 - ☐ Some high school, but did not graduate
 - ☐ High school graduate or GED
 - ☐ 2 year college degree
 - ☐ 4 year college degree
 - ☐ Greater than 4 year college degree
- 2) What is your race/ ethnicity?
 - ☐ Hispanic/Latino
 - ☐ White/Caucasian
 - ☐ Black/African American
 - ☐ American Indian
 - ☐ Asian
 - ☐ Other
- 3) What is your primary language spoken?
 - ☐ English
 - ☐ Spanish
 - ☐ French
 - ☐ Chinese
 - ☐ Russian
 - ☐ Vietnamese
 - ☐ Other
- 4) What is your age?
 - ☐ 18-25
 - ☐ 26-35
 - ☐ 36-45
 - ☐ 46-55
 - ☐ 56-65
 - ☐ 66-75
 - ☐ Greater than 75
- 5) What are your living arrangements?
 - ☐ Live alone
 - ☐ Live with spouse/significant other
 - ☐ Live with children/child
 - ☐ Live in assisted living facility
 - ☐ Live in long term care facility

- 6) What is your monthly household income?
- ☐ 0 to <1000 dollars/month
 - ☐ 1000 to <2000 dollars/month
 - ☐ 2000 to <4000 dollars/month
 - ☐ 4000 to <6000 dollars/month
 - ☐ 6000 to <8000 dollars/month
 - ☐ >8000 dollars/month
- 7) In general, how would you rate your overall health?
- ☐ Excellent
 - ☐ Very Good
 - ☐ Good
 - ☐ Fair
 - ☐ Poor
- 8) Do you have any of the following existing diagnoses?
- ☐ Heart Failure
 - ☐ Diabetes (Type I or Type II)
 - ☐ High Blood Pressure
 - ☐ Arthritis
 - ☐ Peripheral Vascular Disease
- 9) What is your marital status?
- ☐ Single
 - ☐ Married
 - ☐ Widowed
 - ☐ Long- term relationship

APPENDIX F

Post Cardiac Arrhythmia Ablation Discharge Follow-up Enhanced Education Intervention Phone Call Documentation Log (Will be maintained in Excel spreadsheet and include these items)

Patient name:

Date of Procedure:

Discharge date:

Procedure Patient Had:

Date/Time of Phone call attempt one:

Date/Time of Phone call attempt two:

Date/Time of Phone call attempt three:

APPENDIX G

Post Cardiac Arrhythmia Ablation Discharge Enhanced Education Script

Hello Mr./Mrs./Ms. _____ this is (caller's name) a (clinician type) from (name of hospital). If you will recall, prior to your (type of ablation) ablation procedure with Dr.(name of Dr. who performed procedure), you had consented to take part in an educational research project. I am calling in follow up to your procedure as part of the research project.

Is this is good time to talk?

(if answers yes, continue with script)

(if answers no, when would be a better time to call?)

As you know, the type of ablation that you had performed was a (type of ablation performed).

Address knowledge of disease: Part of the discharge education is that I want to be certain that you understand the arrhythmia that was treated and why it was treated. (depending on the type of ablation- educate about the specific arrhythmia)

Assess understanding: Do you have any questions about the type of arrhythmia that was treated?

(if yes- proceed to answer patient's questions)

(if no- proceed with script)

Reinforce medication education and understanding: An important part of your successful discharge is understanding your medications and when and why you are taking them. Let's take a few moments to review your medications. (review patient's medications, purpose of each medication and timing of the medication- *Medication list will be reviewed prior to phone call and available at time of phone call*)

Explain what to expect after procedure and when to seek medical attention: Another important part of a successful discharge is understanding what you may expect after your (type of ablation) procedure.

It is not uncommon to have some soreness in your groin area where the catheters (large IVs) were placed. The site(s) should not however be painful, they should not be bleeding or swollen. If the site(s) is/are bleeding, lie down and apply pressure directly to the site(s) for 10 minutes. If the bleeding stops, there is no need to seek medical attention. If the site(s) are bleeding and continue to bleed after applying pressure, are severely painful you should seek medical attention.

Blanking period: The 3 month period of time after your ablation procedure is called the “blanking period”. It is not uncommon to experience short bursts of the arrhythmia during this time frame.

When to seek medical attention vs when to call provider :

If you are experiencing chest pain, shortness of breath, dizziness or lightheadedness different than what you experienced with your arrhythmia, you should seek medical attention.

If you experience short periods of the arrhythmia but the arrhythmia goes away in a short period of time, you should call (provider’s name) office at (provide telephone number). If it is off hours, you may ask to speak to the cardiologist on call.

Follow up appointment: Mr/Mrs/Ms (patient name), your follow up appointment with (provider name who appointment is scheduled with) is scheduled for (date) at (time). The location of this appointment is (state address of site where patient will have appointment).

Mr/Mrs/Ms (patient name) thank you for taking the time to speak with me today. I hope that I was able to provide valuable information and answer all of your questions. If you have further

questions, please feel free to contact me (name of nurse practitioner placing call) at (phone number).

Process Data

Participant #

Time of phone call:

Task:

Task Completion: Yes/No

Comments (Include general challenges/ comments on how intervention went)

Time phone call finished:

APPENDIX H

Informed Consent Checklist

Date:

Patient Initials:

Individual Obtaining Consent:

Date and Time Patient Given Consent:

Subject Given Adequate time to Review Consent: Yes / No (circle one)

Consent Descriptive process to include the following:

Patient expressed understanding of the following study detail:	<input type="checkbox"/>
Condition/ Procedure under investigation	<input type="checkbox"/>
Purpose of the study	<input type="checkbox"/>
Voluntary Nature of participation in the study	<input type="checkbox"/>
Possible Risks/ Benefits	<input type="checkbox"/>

Cost of participation: No charge to for participation in this study	<input type="checkbox"/>
Study Patient compensation: there will be no compensation or incentive provided for participation in this study	<input type="checkbox"/>
Confidentiality of study information	<input type="checkbox"/>
Understands need to be able to attend 1-2 week follow up visit	<input type="checkbox"/>
Contact information provided to study subject including primary investigator contact information, study- related questions answered	<input type="checkbox"/>
Study subject consents to collection of demographic data	<input type="checkbox"/>
All questions were answered to the patient's satisfaction	<input type="checkbox"/>

Written informed consent was signed Yes/No (circle one)

Date informed consent signed: _____

Time of consent:_____

Copy of Informed Consent was given to patient: Yes/ No (circle one)

APPENDIX I

Consent Form for Participation in a Research Study



Principal Investigator: Millicent Malcolm

Student Researcher: Kristin Bott

Study Title: The Effect of Enhanced Patient Education on Patient Satisfaction and 30-Day Readmission Rates after Cardiac Arrhythmia Ablation

Introduction

You are invited to take part in a research study to assess patients' satisfaction and 30-day readmission rate after a cardiac ablation procedure. We are interested to find out if following up an ablation procedure with education will have an impact on your experience after the ablation. You are being asked to participate because you are planning to undergo a cardiac ablation procedure.

Why is this study being done?

The purpose of this research study is to assess cardiac arrhythmia ablation patients' satisfaction after ablation procedure and assess 30-day readmission rate after ablation procedure. We will use the results to make improvements to the post ablation education process.

What are the study procedures? What will I be asked to do?

If you agree to be in the study you will be asked to complete a 22-question survey at your first follow-up visit after your ablation. You will also be asked to complete a nine (9) question demographics questionnaire at this time as well. You will be allotted as much time as necessary to complete the survey and questionnaire. We expect that it will take 15-30 minutes, but you will be allotted as much time as you need to complete the surveys after your visit.

As a participant in this study, you may or may not receive one additional phone call that is expected to last no longer than 15 minutes. If you receive this additional phone call, you will not be required to answer additional questions during the phone call.

Thirty (30) days after the ablation procedure you will receive a phone call that will require you to answer one yes or no question. The phone call is expected to take less than five (5) minutes.

All patients who are scheduled for a cardiac arrhythmia ablation procedure are considered candidates for this study. To be included in this study, you must speak English and you also must be available for a follow up appointment 1-2 weeks after you cardiac ablation procedure.

No videotaping or audiotaping will be used.

What are the risks or inconveniences of the study?

We believe there are no known risks associated with this research study; however, a possible inconvenience may be the time it takes to complete the study.

What are the benefits of the study?

You may not directly benefit from this research; however, we hope that your participation in the study may help researchers and clinicians better understand post ablation needs and improve the process for other patients.

Will I receive payment for participation? Are there costs to participate?

There are no costs and you will not be paid to be in this study.

How will my personal information be protected?

The following procedures will be used to protect the confidentiality of your data. The researchers will keep all study records (including any codes to your data) locked in a secure location. Research records will be labeled with a code. The code will be three digits derived from a number beginning with 001 that reflects how many people have enrolled in the study. A master key that links names and codes will be maintained in a separate and secure location. The master key and data files will be destroyed 3 years after study completion and publication. All electronic files (e.g., database, spreadsheet, etc.) containing identifiable information will be password protected. Any computer hosting such files will also have password protection to prevent access by unauthorized users. Only the members of the research staff will have access to the passwords. Data that will be shared with others will be coded as described above to help protect your identity. At the conclusion of this study, the researchers may

publish their findings. Information will be presented in summary format and you will not be identified in any publications or presentations.

We will do our best to protect the confidentiality of the information we gather from you but we cannot guarantee 100% confidentiality.

You should also know that the UConn Institutional Review Board (IRB), Research Compliance Services and the Office of Research at Stamford Hospital may inspect study records as part of its auditing program, but these reviews will only focus on the researchers and not on your responses or involvement. The IRB is a group of people who review research studies to protect the rights and welfare of research participants.

Can I stop being in the study and what are my rights?

You do not have to be in this study if you do not want to. You do not have to answer any question that you do not want to answer on the surveys. If you agree to be in the study, but later change your mind, you may drop out at any time without any consequence to your ablation appointment or procedure. There are no penalties or consequences of any kind if you decide that you do not want to participate. You do not have to answer any question that you do not want to answer.

You may be withdrawn from the study at any time due to missed appointments or the inability to contact you via telephone. To notify the study staff that you would no longer like to participate, please email the student researcher at Kristin.bott@uconn.edu or call the student researcher at 475-299-0100.

Whom do I contact if I have questions about the study?

Take as long as you like before you make a decision. We will be happy to answer any question you have about this study. If you have further questions about this study or if you have a research-related problem, you may contact the principal investigator, Millicent Malcolm 860-614-8154 or 860-486-1786 or the student researcher Kristin Bott 475-299-0100. If you have any questions concerning your rights as a research participant, you may contact the University of Connecticut Institutional Review Board (IRB) at 860-486-8802.

Documentation of Consent:

I have read this form and decided that I will participate in the project described above. Its general purposes, the particulars of involvement and possible risks and inconveniences have been explained to my satisfaction. I understand that I can withdraw at any time. My signature also indicates that I have received a copy of this consent form.

Participant Signature:

Print Name:

Date/Time:

Signature of Person

Print Name:

Date/Time:

Obtaining Consent

Appendix J

Study Participant Recruitment Script

Introduction : Good afternoon / morning, Mr/Mrs/Ms _____. My name is Kristin Bott and I am studying at the University of Connecticut in the Doctor of Nursing Practice Program and I am working on a research study as part of my program.

I am inviting you to participate in this study , if you may be interested as it pertains to patients who undergo a cardiac ablation procedure. I am interested in learning about your experience with the ablation procedure and process.

If you choose to participate in the study, there will not be any changes to the procedure itself, it will not change or effect the time that you are in the hospital and it will not change the amount or frequency of follow up appointments and will not affect your care.

If you choose to participate, you will complete a survey at your post-operative follow up visit and answer one question over the telephone after 30 days after your ablation has been completed. The initial survey will take approximately 15 minutes to complete but if you require more time to complete the survey, it will not be a problem. I will read the questions on the survey out loud to you at the follow up visit. I will be the person calling you after thirty days and the phone call should take under one minute.

Participation in this study is voluntary and there is no cost or reward/compensation associated with participation. Your identity will be completely confidential and any demographic data collected will not be able to be used to identify you.

If you are interested in participating, I have a consent form available that I will review with you and ask you to sign.

Thank you so much for your time.