

DNP Portfolio Executive Summary  
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The DNP program competencies I have achieved using leadership and collaboration as evidenced by my clinical inquiry project and case studies include: (1) Practice within an advanced practice nursing (APN) specialty in a professional, evidence-based, skilled and ethical manner; (2) Influence health and health outcomes of individuals, groups, and populations through clinical inquiry; and (3) Influence health policy and systems of health care in the local organization.

I developed a pilot study that had the potential to influence health care outcomes (secondary prevention of coronary heart disease for the individuals and population in my APN specialty (general cardiology). The DNP program has enhanced my qualities for effective team leadership, collaboration with other health care professionals, application of evidence-based practice and understanding of organizational climate in successful innovation. The APN-led multidisciplinary group clinic visits for secondary prevention of coronary heart disease (CHD) was piloted in an outpatient cardiology clinic to determine its feasibility and acceptability. Secondary aims were to determine if participation in the group visits result in changes in risk reduction behaviors and improvements in risk factor outcomes. Members of the multidisciplinary team included the dietician, social worker, clinical pharmacist and the nurse practitioner. Pending a business proposal, this program is being considered as an ongoing program within the cardiology clinic and within the region for patients with established CHD. Since entering the program, my practice as a cardiology nurse practitioner have improved tremendously by using evidence-based practice by translating research into practice.

Using this portfolio, my practice and competencies are different now that I almost have a DNP. My experience has broadened. The depth of my clinical expertise as well as my leadership skills will enhance my ability to inspire and lead change.

Using this portfolio, I am different in ways from being an individual clinician to an APN with multiple roles. This DNP program has enhanced my clinical, organizational, economic and leadership skills to continue to seek ways to improve work environment in the organization thereby improving patient satisfaction and enhanced patient outcomes. My strengths as a better practitioner and as a change agent (as evidenced by my project and portfolio) will inspire others to lead change and add value to my place of employment.

Running Head: SECONDARY PREVENTION OF CHD

Advanced Practice Nurse-Led  
Multidisciplinary Group Clinic Visits  
in  
Secondary Prevention of Coronary Heart Disease

Clinical Inquiry Proposal

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## Description and Significance of the Clinical Problem

### *Describe the problem*

Patients with established coronary heart disease (CHD) have a high risk of subsequent myocardial infarction (MI), stroke, and death (Hennekens & Cannon, 2008). Comprehensive risk factor interventions extend overall survival, improve quality of life, decrease the need for interventional procedures such as angioplasty and coronary artery bypass grafting (CABG), and reduce the incidence of subsequent MIs (Thomas, King, Oldridge, Pinam, & Spertus, 2007). Despite the existence of expert consensus guidelines on cardiovascular risk reduction by the American College of Cardiology (ACC), secondary prevention therapies to decrease morbidity and mortality are underutilized (Gluckman, 2004).

There is no effective system for intensive secondary prevention of CHD in patients who have suffered cardiac events or for those patients who have undergone revascularization procedures in the author's current clinical setting. In addition, the average hospital stay for acute coronary syndrome (ACS) has been shortened, limiting the opportunity to counsel patients about risk-reducing strategies (Gluckman, 2004).

### *Population affected by the problem*

The population affected by the problem is out patient adults (18+ years) who have had cardiac events and post coronary revascularization procedures [percutaneous intervention (PCI), stent, angioplasty and CABG]. The setting for this clinical inquiry is a cardiology clinic in a particular health maintenance organization (HMO) where there are approximately 30 patients a month post revascularization procedure plus the

numbers of patients who suffered MI or ACS or those who have diagnosis of CHD and stable angina.

### *Epidemiology*

In 2000, the ACC estimated that the population of 12.5 million Americans with the diagnosis of CHD in that year would double in size by 2050, due to the aging population (Foote, 2000). In 2000, acute MI was diagnosed in 1.1 million Americans and approximately 850,000 patients underwent coronary revascularization procedures (Pearson, 2007). Continued case-fatality reductions would further accelerate the rise in prevalence and the implications for health care costs and for public health will be enormous (Pearson). Some of these survivors will have sequela of their disease such as disability and reduced quality of life (Pearson). Almost all will require numerous medications, increased care by medical specialists, and recurrent testing; some will need recurrent hospitalization and invasive procedures (Pearson). In spite of this, studies have shown that medical therapies for secondary prevention of CHD are underutilized (Gluckman, 2004).

### *Brief description of literature re: clinical problem*

Meta-analyses and systematic reviews provide and summarize the extensive evidence that has been generated from published clinical trials demonstrating that cardiac rehabilitation services (which include secondary prevention risk reduction) are beneficial for patients with established CHD. These benefits include improved processes of care and risk factor profiles that are closely linked to subsequent reduction in mortality and morbidity (Oldridge, et al., 1998; O'Connor, et al., 1989; Linden, et al., 1996; AHRQ, 2005). Pooled data from the randomized controlled trials (RCTs) of cardiac

rehabilitation demonstrate a mortality benefit of approximately 20% to 25% and a trend towards reduction of nonfatal recurrent MI over 12 months (Thomas, et al., 2007). While advances in risk factor modification have led to a decline in CHD mortality, implementation of risk reducing practices for both inpatients and outpatients remain sub optimal (Gluckman, 2004; Rogers, et al., 2000).

*Organizational and local knowledge and status of the clinical problem*

Currently this particular cardiology clinic has been outsourcing cardiovascular surgical, revascularization and cardiac rehabilitation services to outlying medical centers. This population of patients has several co-morbidities and risk factors, e.g., diabetes mellitus, hypertension, hyperlipidemia, smoking, and depression/anxiety. Currently, in this particular cardiology clinic, patients are followed at 2 weeks and 4 weeks post revascularization procedure by a nurse practitioner (NP) or a physician assistant (PA). However, in April 2009, all revascularization procedures will be done at the HMO hospital, This is referred to as internalization – bringing in the revascularization procedures including surgery to this particular hospital. There is support for a formal secondary prevention program on site.

*Importance of the clinical problem to Advanced Practice Nurses (APNs)*

APNs possess the potential to provide leadership in facilitating program development of an alternative cost effective method of providing care to cardiac patients, such as the group clinic visits which incorporate the cardiac rehabilitation/secondary prevention guidelines as proposed here. A collaboration (especially in this timely internalization period) with various health-care providers, (pharmacist, nutritionist, social worker) cardiology staff and administration is crucial for

the organization. APNs may share their knowledge and expertise not only in their practice, but also in system-level change and policy formulation, which is important in health care innovation and program development. APNs have been identified by the regional chief of cardiology as appropriate for leading this new program.

*Desired outcomes of the project*

The desired outcomes are changes in behaviors (adherence to medications, smoking cessation, regular physical activity, diet adherence), and improvements in risk factor reduction. Risk factors include low density lipoprotein cholesterol (LDL-C), blood glucose, weight and blood pressure. A heart healthy diet is one which includes low fat and low cholesterol.

*Purpose Statement*

The purpose of this practice improvement project is to develop an effective program incorporating APN-led multidisciplinary group clinic visits using evidence-based-guidelines for secondary prevention of CHD.

*The Clinical Inquiry Questions:*

Does participation in APN-led multidisciplinary group clinic visits result in changes in risk reduction behaviors (adherence to medications, smoking cessation, regular physical activity, diet adherence) among patients with CHD?

Does participation in APN-led multidisciplinary group clinic visits result in improvements in risk factor reduction (improvements in LDL- cholesterol, blood glucose, weight and blood pressure)?

What is the feasibility and acceptability of APN-led multidisciplinary group clinic visits in secondary prevention of CHD?

## Conceptual Framework

### *Description of the framework*

Self-efficacy theory will serve as the conceptual framework for this clinical inquiry. Self-efficacy promotes health outcomes by influencing health behavior and lifestyle modification in patients with CHD. Self-efficacy refers to one's self confidence to perform a behavior that will attain a desired goal (Bandura, 1982). Self-efficacy may be used clinically in the cardiac rehabilitation setting to evaluate the patient's efficacy expectations and the health care provider could then implement appropriate interventions to strengthen these expectations. This secondary prevention program will include interventions based on four informational sources: 1.) enactive attainment, which is the actual performance of a behavior; 2.) vicarious experience or visualizing other similar people performing the behavior; 3.) verbal persuasion or exhortation; 4.) physiological state or physiological feedback during a behavior (Bandura, 1982). (See Figure 1. Factors that promote secondary CHD prevention).

### *Link to purpose and clinical inquiry questions*

Health care professionals must emphasize the seriousness and long-term outcomes of untreated heart disease (Gentz, 2000) by implementation of secondary prevention guidelines. One way to achieve this is through cardiac rehabilitation/secondary prevention group clinic visits. To influence health behaviors that decrease risks of cardiac events, patients will be invited to attend group visits at which their knowledge and skills may improve, thereby enhancing self efficacy which influence performance of healthy behaviors and increase health outcomes. Self-efficacy works by enhancing one's belief that he/she possesses the necessary knowledge and skills needed

to perform a specific behavior. There is strong evidence for the role of self-efficacy in behavior change in cardiac patients. Jenkins (1985) did a descriptive study following an MI depicting the relationships between self-efficacy expectations and behavior. This study provided some support for the impact of specific interventions to strengthen self-efficacy expectations and influence behavioral outcomes following cardiac surgery. Allen, Becker and Swank (1990) concluded in their study that self-efficacy related to performance of activities of daily living at discharge was the best predictor of 6-month functional status. Schuster and Waldron (1991) studied the impact of self-efficacy expectations on attendance in a cardiac rehabilitation program. Self-efficacy theory was used to guide the development of cardiac rehabilitation programs (Hiltunen, Wankler, Rait, Buselli, Carroll & Rankin, 2005).

### *Conceptual Definitions*

*Self-efficacy* was defined by Albert Bandura (1977) as one's judgment of his/her capabilities to organize and execute courses of action required to attain designated types of performances. The focus is not on the skills one has but the personal judgment of what one can do with those skills (Bandura, 1982). The theory of self-efficacy is based on the belief that what people think, believe, and feel affects how they behave.

### *Review of Literature*

Cardiovascular heart disease is the leading cause of morbidity and mortality in the United States, accounting for over 50 percent of all deaths (Thomas, et. al., 2007). CHD with its clinical manifestations of stable angina pectoris, unstable angina, acute MI, and sudden death affects 13.5 million Americans (Thomas). According to the World Health

Organization (2005), individuals with established CHD, particularly those who have survived a myocardial infarction, have high rates of recurrent vascular events and are much more likely to die in a recurrent event. The risk of major coronary events for patients with CHD is over 20% per 10 years [Third Report of the National Cholesterol Education Program (NCEP) Expert Panel, 2001]. The almost one million survivors of myocardial infarction and the seven million patients with stable angina pectoris are candidates for cardiac rehabilitation, as are the 309,000 patients who undergo CABG surgery and the 362,000 patients who undergo PCI each year are eligible for the cardiac rehabilitation/secondary prevention services (Gluckman, 2004).

However, patients may not access secondary prevention programs such as cardiac rehabilitation despite its association with a 20% reduction on mortality (Cooper, Cutler, & Desvigne-Niclaus, 2000). Only about 15 to 30% of acute myocardial infarction patients receive cardiac rehabilitation services (Cooper). Reasons for nonparticipation include lack of physician referral, poor patient motivation, and logistical or financial constraints (Cooper; Thomas, et al., 2007).

#### *Cardiac Rehabilitation.*

Recovery from an MI or cardiac surgery is often accompanied by a host of psychological and physical problems (Shumaker & Czajkowski, 1994). The consequences of a cardiac event include energy loss, recurring chest pain, and dependence on others, and tension in social and sexual relationships. As patients begin to understand the ramifications of chronic heart disease and experience the emotions related to that understanding, enrollment in a structured outpatient cardiac rehabilitation program can provide them with information, guidance and support.

The most difficult time period in the recovery process is the first month following discharge from the hospital. The aim of all cardiac rehabilitation programs is the return to an enjoyable and productive life for patients with heart disease. The goal for these patients is improved function based on relief from physical symptoms, decreased severity of the illness, and a slowing of disease progression (Shumaker & Czajkowski, 1994). Cost-effective interventions are available for secondary prevention, and the potential gains associated with the consistent use of such interventions is very large. Aspirin (ASA), beta-blockers, angiotensin converting enzyme inhibitor (ACEI) inhibitors and lipid lowering therapies lower the risk of future vascular events in high-risk patients by about a quarter each (Cooper, et al., 2000). The benefits of these interventions appear to be largely independent, so that when used together it is expected that two-thirds to three quarters of future vascular events could be prevented (Cooper).

There is a remarkable variation in prescription rates of these proven secondary prevention strategies. B-blocker rates vary by region from <20% to >80% of MI patients leaving the hospital with B-blocker prescription (Cooper). Patients with CHD infrequently receive the recommended levels of treatment for hyperlipidemia (Cooper). Clinical trials have demonstrated that lowering cholesterol levels reduces the risk of coronary death by 18-35% (Heart Protection Study, Collaborative Group, 2002). An audit of 48,586 medical records of patients with CHD in 140 practices found only 44% had an LDL cholesterol measurement and only 29% had an LDL cholesterol level of <100 mg/dl. (Cooper).

In addition to these drug therapies, if smoking cessation and aggressive blood

pressure lowering are attained, it may be possible to lower the risk of future vascular events by about four-fifths in high-risk people (WHO, 2005). Given the potential gains, making these interventions affordable and accessible to all patients with CHD could lead to substantial individual and public benefits (WHO, 2005).

*Nurse –Led Clinics.*

Rafterty, Yao, Murchie, Guiding, Campbell, Ritchie, et al., (2005) showed the cost effectiveness of nurse led clinics and the outcome measures are the overall costs to health service and cost per life years and quality adjusted per year (QALY) gained. The conclusion was that nurse led clinics for the secondary prevention of CHD in primary care seem to be cost effective compared with most interventions in health care, with the main gains in life years saved.

Page, Lockwood, & Conroy-Hiller, (2005) did a systematic review on patients with diagnosis of CHD which consisted of six randomized controlled trials (RCTs) and the recommendations were that the use of nurse-led clinics is recommended for patients with CHD. The use of nurse-led clinics may increase clinic attendance and follow-up rates. Nurse-led clinics are recommended for patients who require lifestyle changes to decrease their risk of adverse outcomes associated with CHD. Campbell et al., (1998), did a RCT on secondary prevention clinics for CHD looking at the effect on health and overall improved patients' health. The greatest benefit was in functional status, improvements in chest pain, and decreased need for hospital admissions. Targeting secondary prevention in general practice population can achieve significant and important benefits to patients' health within the first year. The SPHERE Study (Secondary prevention of heart disease in general practice), is a RCT that looked at the primary

outcomes: blood pressure, total cholesterol, and physical and mental health status and hospital re-admissions. A systematic review concluded that such programs do improve processes of care, reduce hospital admissions and enhance quality of life and functional status (Murphy, Cupples, Smith, Byrne, & Leathem, 2005). There is also evidence that nurse-led clinics, cognitive behavioral interventions, and tailored training identified by practice staff are effective in improving secondary prevention in general practice and facilitating patients to make lifestyle changes (Murphy, et al., 2005).

In this particular cardiology clinic, there are Web-based national guidelines for clinicians that are available, but these are not uniformly followed. In the past, there was a Multifit program which was run by a registered nurse which focused on management and education of patients discharged from the hospital following acute coronary events.

Group clinics are known to have reduced number of emergency room visits through more efficient management of patients with complex health problems benefiting some HMOs (Kaiser Permanente, Southern California Region, retrieved March, 2008).

### *Summary*

Based on the extensive review of the literature, there is a need to implement new strategies and to explore different models of care such as group clinic visits to utilize the proven strategies for secondary prevention of CHD. The reorganizing of health care teams, use of non-physician professionals such as APNs and by applying self-efficacy in group clinic visits may help to achieve cardiovascular risk reduction outcomes. There is substantial evidence that structured systematic care is important to improve levels of secondary prevention of CHD. Further, there is also evidence that nurse-led clinics are effective in improving secondary prevention in general practice and facilitating patients

to make lifestyle changes.

The success of this worthwhile, timely, and much needed project depends on the achievement of measurable CHD secondary prevention outcomes within the 8-week pilot program: changes in risk reduction behaviors (in adherence to medication, smoking cessation, regular physical activity and diet adherence), and improvements in risk factor reduction (improvement in LDL cholesterol, weight, blood glucose, and blood pressure). A follow up study (beyond the 8 week pilot program) is recommended to determine if this model of care decreases morbidity and mortality, decreases frequency of hospitalizations, and provides cost-effective care for this particular HMO. The results may warrant adoption of this model of care for the entire organization.

In conclusion, the APN-led multidisciplinary group clinic visits have the potential to successfully meet the national benchmarks by implementing the evidence-based practice guidelines in secondary prevention of CHD. Due to the study's short eight-week pilot program, it is hoped that the investigator will capture incremental changes or trends of change in the LDL cholesterol, blood glucose, weight and blood pressure from their baseline, however the targeted clinical goals for secondary prevention of CHD (Thomas, et al., 2007), which might be used for future longitudinal research are:

Lipid profile: LDL < 100, HDL >40, triglycerides <150

Blood pressure: systolic/diastolic <130/80

Weight: BMI: 18.5 to 24.9 kg/m<sup>2</sup>, waist circumference: men <40 inches; women  
<35 inches

Blood glucose: fasting blood glucose 110-125 mg/dl

## Methods

### *Study Design*

The clinical inquiry project will evaluate the implementation of APN-led multidisciplinary group clinic visits for secondary prevention of CHD (hereafter referred to as group visits). The clinical inquiry questions are for patients with CHD:

1. Does participation in APN-led multidisciplinary group clinic visits result in changes in the CHD risk reduction behaviors of adherence to medications, smoking cessation, regular physical activity and adherence to a heart healthy diet?
2. Does participation in APN-led multidisciplinary group clinic visits result in improvements in the CHD risk factor of LDL cholesterol, blood glucose, weight and blood pressure?
3. What is the feasibility and acceptability of APN-led multidisciplinary group clinic for participants in secondary prevention of CHD?
  - a. Qualitative data will be collected from participants and members of the multidisciplinary team.

A single group pretest-posttest prospective design will be used to answer the clinical inquiry questions numbers one and two, and the third question will use a descriptive design. The designs are diagrammed below:

For question No. 1: Y1 X Y2

For question No. 2: Y1 X Y2

For question No. 3: O

This design involves collection of data to establish a baseline (pretest) = Y1,

followed by the intervention (group visits). Data will be collected again on the same set of variables after the intervention (posttest) = Y2. The independent variable (X) is group visits. The eight dependent variables are adherence to medications, smoking cessation for those who use tobacco, regular physical activity, diet adherence, LDL cholesterol, blood pressure, weight and blood glucose.

Use of a single-group design may influence the validity of this study. For example, in this study, it might be difficult to conclude if the outcomes are due to medication effect versus the group intervention. In a future study, this limitation can be avoided if a control group, which would receive the current one on one-clinic visits is added.

#### *Setting and Sample*

This study will be conducted at a health maintenance organization (HMO) located in an urban setting in the northwest US region. The group visits will take place in the conference rooms within the campus where the HMO cardiology clinic is physically located.

The population for this study is outpatient adult patients (18+ years) with diagnosis of CHD who are enrolled in the catchment area for the HMO cardiology service. A convenience sample of 12 patients will be recruited to yield eight to ten participants who complete the group visits. The inclusion criteria are all adult CHD patients (18+ years) who are enrolled in the HMO cardiology clinic who are being seen two weeks post hospital discharge with the diagnosis of stable angina, unstable angina, ACS, MI, or post-revascularization (PCI, CABG). The exclusion criteria are any patient not able to attend group sessions due to medical restriction; unable to speak English; and

patients with severe cardiac disease with a poor prognosis. The investigator will determine eligibility.

### *Recruitment*

Currently, patients are being followed up in the out patient cardiology clinic two and four weeks after hospital discharge with a one on one (provider/patient) visit. During this visit, the investigator will offer the alternative of group visits instead of the usual one on one 4<sup>th</sup> week visit, with full explanation of the risks and benefits of the alternative method. Those patients who are interested in the group visits will be consented (see below) and will be given a handout of the group activities and an appointment will be set prior to leaving the clinic. A phone call reminder will be done 24 hours prior to the group visit by the appointment scheduler.

### *Program of APN-led multidisciplinary group visits*

A group visit is a scheduled visit for a group of patients, often with similar health problem or concerns; in this case it is for the secondary prevention of CHD. The group visit meets under the direction of the physician or other licensed health care professional. In this project the investigator will lead the group along with the members of the multidisciplinary team of the physician champion, pharmacist, nutritionist and social worker. This multidisciplinary group will provide an opportunity to integrate clinical services, education and group support. The program includes three group sessions lasting one and a half hours over an eight week period. Participant study involvement will last eight weeks. (See Table 1 for the design of program and assessments)

Table 1. Design of Program and Assessments

| Week 1<br>Recruitment,<br>Determine<br>Eligibility &<br>Pre-test           | Week 2<br>GV #1             |  | Week 4<br>GV #2               |  | Week 6<br>GV #3  |  | Week 8<br>Post-test                             |
|--|-----------------------------|--|-------------------------------|--|--|--|---|
| Obtain informed consent by NP  | Welcome, orientation        |  |                               |  | Participant debriefing   |  | Collection of data by NP                        |
| Make appointment for the GV by the Medical Assistant (MA)                  | BP, weight, Review meds     |  | BP, weight, Review meds       |  |  |  | Mail thank you letter for participation By NP   |
| Pretest Questionnaires on diet, exercise, medication adherence and smoking | Short Overview of CHD By NP |  | Nutrition overview            |  | Post test Questionnaires on diet, exercise, medication adherence and smoking |  | Obtain labs by participants                     |
| Examinations by NP (during initial post op/hospital visit)                 | Social Worker overview      |  | Nutrition group facilitation  |  | Multi-disciplinary group facilitation (review)                               |  |   |
| Confirm room and schedule by NP, audiovisual, etc.                         | Clinical Examination By NP  |  | Pharmacist Group Facilitation |  |  |  | Follow up phone call status and interview guide |
|  |                             |  | Clinical examination By NP    |  |  |  |   |

In this program, a combination of structured and facilitated group approaches will be utilized. The first session will be a structured educational group visit followed by

individual focused health assessments and clinical examinations performed by the nurse practitioner. The second session will be the facilitated approach, which includes group interaction, resembling the patient/provider interaction of an individual visit. Pre-intervention laboratory test results will be discussed followed by a brief health assessment and focused clinical examination may be conducted. The role of self-efficacy in behavior change is emphasized which includes adherence to medications, change in the participant's eating habits, physical activity and smoking cessation for those who use tobacco. The influence of the group interaction is an advantage in bringing about improved management skills (Kaiser Permanente Hawaii Group Visit Toolkit, 2007).

Currently patients receive two follow-up visits with the NP or PA, at two and four weeks post hospitalization for a cardiac event or revascularization procedure. At their first follow up visit, eligible patients would be invited to attend the group visits with a multidisciplinary team. The difference between the individual and group visits is the inclusion of additional qualified team members who will present information about the patient's cardiac condition and be available for questions and support. Team members will include a dietician, pharmacist and social worker. On week one, during the recruitment process, the investigator will determine eligibility, obtain informed consents, and collect the pretest data. Medical records will be reviewed to obtain blood glucose (laboratory report), LDL cholesterol (laboratory report), weight, cardiac preventive medications (beta-blockers, ACEI, ASA, statin), diagnoses and procedures relating to CHD, hypertension and diabetes. Participants will be given appointment for the group visits and will be given a schedule of group activities. Pretest questionnaires will be given out to participants, which include diet adherence, physical activity, and medication

adherence. All of this information would normally be collected during individual visits but not using standardized measures in diet adherence, medication adherence and physical activity. The intervention portion of this study is the actual group format versus an individual follow up session. The multidisciplinary group format will provide an opportunity to integrate clinical services, education, and group support.

Week two is the first group session. All three group sessions will include measuring of BP and weight, and medication review. The first group session includes welcome and orientation, short overview of CHD by the NP using audio-visual aides, social worker's overview of behavior change and role of self efficacy, followed by group facilitation by the social worker and the NP. The last part of week two will include the individual clinical/health assessment by the NP. Second group visit (week four) includes nutrition and pharmacy/cardiac preventive medication overview followed by group facilitation and individual health assessment. Third group visit (week six) will include participants' debriefing. At this final group session participants and the multidisciplinary team members will have an open discussion of lessons learned from the previous first two visit sessions. The post test measures on physical activity and diet adherence and smoking status will once again be collected. Week eight will be glucose and cholesterol laboratory collection, and phone call follow up of laboratory results. Participants will be asked about their perceptions of the group visits (see enclosed interview guide).

### *Measures*

See Appendix 2 for copies of the measures.

Table 2. Variables and Measures.

| Outcome Variables                    | Measures  |
|--------------------------------------|---|
| Medication Adherence                 | Self-Reported Medication Taking Scale                                   |
| Smoking Cessation                    | Single Item (adapted from the AACVPR)                                   |
| Regular Physical Activity            | Self-Management Behaviors: Exercise                                     |
| Diet Adherence (Heart Healthy Diet)  | Three-Day Food Record   |
| LDL cholesterol                      | Laboratory Test   |
| Blood Pressure (Systolic, Diastolic) | Clinical Measurement  |
| Weight                               | Clinical Measurement  |
| Blood Glucose                        | Clinical Measurement  |
| Demographics                         | Age, Gender   |
| Clinical Characteristics             | Diagnoses, Revascularization Procedures, Cardiac Preventive Medications |

The measures chosen for this study are composed of short questions and items to decrease participants' burden and to increase feasibility. Some of the participants are elderly and have recently undergone revascularization procedures including open heart surgeries.

The term medication adherence, the ability to take medications as prescribed, is used to describe the patient's ability in accurate use of medications, that is the correct amounts on the dosing schedule in accordance with any special instructions. Adherence to cardiac preventive medications includes the statins, ACEI, beta-blockers, ASA. The Self-Reported Medication-Taking Scale will be used to measure medication adherence (Lorig, Stewart, Ritter, Gonzales, Laurent, & Lynch, 1996). This four-item measure was developed by the Stanford group (Lorig, et al.). Subjects answer "Yes" or "No" to each item with "Yes" scored as "0", and "No" scored as "1". The sum of the answers is the score. A score of 4 is considered high compliance, 3 is moderate compliance, and 2 or less is low compliance.

Smoking cessation will be measured using the AACVPR criteria (Thomas, et al., 2007). Tobacco users are coded as “Never” = 0, “Recent” (quit less than 6 months ago) = 1, “Current” = 2.

Regular physical activity will be measured by the Self-Management Behaviors: Exercise Scale (Lorig, et al.). The items include: (1) stretching or strengthening exercise; (2) walking; (3) swimming or aquatic exercise; (4) bicycling/stationary bike ; (5), other aerobic exercise equipment; (6) other aerobic exercise (specify). Participants will choose one value for each question scaled as “none”, “less than 30 min/wk”, “30-60 minutes/wk”, “1-3 hours/wk”, “more than 3 hours/wk”. Each category is converted to number of minutes spent: None = 0; less than 30 minutes/week = 15; 30-60 minutes/week = 45; 1-3 hours/week = 120; more than 3 hours/week = 180. Time spent in stretching or strengthening exercise is the value for item 1. Time spent in aerobic exercise is the sum of the values for Items 2 through 6.

Adherence to a heart healthy diet is the ability to follow a low cholesterol, and low fat diet. The Three-Day Food Record will be used at baseline and at the final group session to assess adherence to total fat, saturated fat, and cholesterol guidelines (Burke, Dunbar-Jacob, Orchard, & Sereika, 2005). Adherence will be examined by comparing the actual intake of total fat, saturated fat, and cholesterol to the prescribed amount. ATP II guidelines will be applied for fat and cholesterol, as well as the caloric allowance (2500 kcal/day for males, 1800 kcal/day for females). Adherence scores for each nutrient will be calculated in percentages (Burke, et al.). The scores will be done by the dietician.

LDL cholesterol and blood glucose determination will be obtained in a 12-hour fasting state through venous samples and analyzed using standardized laboratory

procedures and will yield continuous data. Blood pressure and weight will be obtained using standardized clinical procedures and will also yield continuous data.

### *Analysis*

Data will be entered into the SPSS (version 15.0) and will be used for all analyses. The independent variable (IV) in this study is group visit. There are eight dependent variables (DV) to be analyzed. Each variable will be analyzed by using paired t test for continuous DV and chi-square for categorical DV.

#### Question No. 1

Does participation in APN-led multidisciplinary group clinic visits result in changes in the CHD risk reduction behaviors of adherence to medications, smoking cessation, regular physical activity and adherence to a heart healthy diet?

- a. Medication adherence and smoking cessation are categorical dependent variables, therefore, chi-square tests will be used to determine if the data from same participants at pre and post-test changed categories  
Ho: distribution across two categories is the same at two time points  
which indicates that there is no difference in medication adherence and smoking cessation from the pre and post intervention (Group Visit).
- b. Physical activity and diet adherence are continuous variables, therefore, paired t tests will be used.  
Ho: There is no difference in physical activity and diet adherence from the pre and post intervention (Group Visit).

#### Question No. 2:

Does participation in APN-led multidisciplinary group clinic visits result in

improvements in the CHD risk factor reduction of LDL cholesterol, blood glucose weight and blood pressure?

LDL cholesterol, blood glucose, weight and blood pressure are continuous dependent variables (DV), therefore paired t tests will be used to determine if the score on each DV changes from pre to post intervention.

Ho:  $\mu$  difference = 0

The null hypothesis will be stated as the mean difference between the pre and posttest score is zero, which indicates that there is no mean difference in LDL cholesterol, blood glucose, weight and blood pressure pre and post intervention (Group visit).

Because of the small sample size, the investigator will accept an increase in alpha or p level of 0.10 instead of 0.05, accepting that the study might have a ten percent chance of error.

Demographics and clinical characteristics will be analyzed with descriptive statistics.

Qualitative descriptive methods will be used to describe and summarize common themes in participants' responses. For question number three, data will be obtained by debriefing/interview. A research team member will take notes during debriefing session and will be summarized in narrative form.

#### *Protection of Human Subjects*

This research will be conducted according to IRB approved protocol and will protect the rights of the participants by adequately obtaining an informed consent including possible risks that might occur. The investigator will conduct the informed

consent process. The group sessions do not contain any medical procedure not normally conducted as part of routine care. Participants will be given a copy of their signed consent for their records. An original signed copy of the consent will be kept as part of the study records. The investigator is normally required to assess the patient's ability to understand and follow directions. Consents forms will be written in English.

The research staff has undergone IRB and HIPAA training. No Protected Health Information (PHI) is being disclosed. If data is shared it will be only in aggregate format. All study data will be stored on secure computers in a locked environment. Only authorized study staff will have access to the study data. Records obtained as part of this study will contain a random study ID known only to the investigator. When the study is complete, the codes will be destroyed.

*Plan for dissemination to stakeholders*

Findings and conclusions of the study will be disseminated and presented to the chief of cardiology who is also the sponsor for the study. The feasibility findings and conclusions of the study will also be presented to the operations and clinic managers.

This pilot study does not include financial analysis. However, future research can be done to determine the cost effectiveness of the APN-led multidisciplinary group clinic visits versus the traditional clinic visits taking into consideration the cost per unit outcome using the incremental change per percent reduction in cholesterol, blood glucose and per unit reduction in BP, etc., decrease in emergency room visits or decrease in hospitalization or decrease in revascularization procedure costs.

*Timeline for project*

Nov 1 – IRB application

Dec. 1 or Jan 1 to March 1 (total of eight weeks) will be the intervention (group visits)

March - will be collection and analysis of the data

April - will be writing results and discussion

Week of May 18 – presentation and dissemination of findings to OHSU and KP

cardiology

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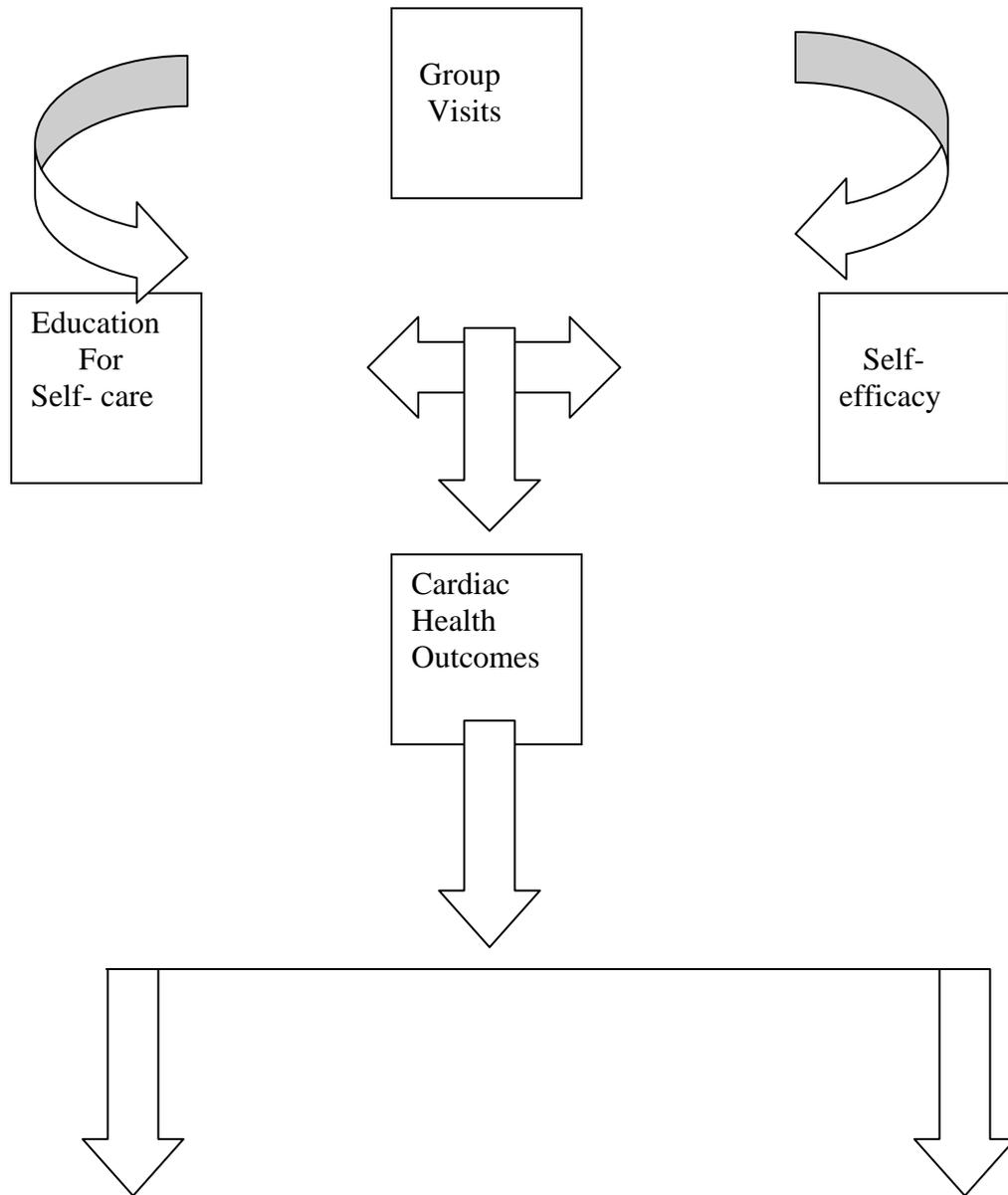
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Appendix:



Changes in risk reduction behaviors: Improvement in risk factor reduction

- Adherence to medications
  - Smoking cessation
  - Regular physical activity
  - Diet adherence
- improvements in LDL chol
  - improvements in blood glucose
  - improvements in weight
  - improvements in BP

Figure 1. Factors that promote secondary prevention of CVD

Running Head: SECONDARY PREVENTION OF CHD – CLINICAL INQUIRY REPORT

Advanced Practice Nurse-Led  
Multidisciplinary Group Clinic Visits  
In  
Secondary Prevention of Coronary Heart Disease

Clinical Inquiry Report

Winnifreda E. Licaycay, RN, ANP, MPH

Oregon Health & Science University

School of Nursing

May 4, 2009

## Results

### *Sample*

After obtaining IRB approval from the Human Subjects Committee of two institutions, twenty-four patients were asked to participate in the group clinic visit program during the first post-discharge follow up appointment. All 24 patients expressed interest in the group visit program, but many cited transportation issues and two patients reported not feeling comfortable in group sessions. Eleven individuals signed the informed consent for the study. One did not participate in any group visits (citing appointment problems). Thus, ten participants began the program, and of these, six completed all three group visit sessions. Four participants brought their spouses to the group sessions. One participant was accompanied by a friend, one by a parent and one by a daughter. Table 1 depicts sample characteristics.

### *Findings*

This clinical inquiry study examined changes in risk reduction behaviors (question 1), risk factor outcomes (question 2), and feasibility and acceptability of the group visit program (question 3). Results are presented for each clinical inquiry questions.

1. *Does participation in APN-led multidisciplinary group clinic visits result in changes in risk reduction behaviors (adherence to medications, smoking cessation, regular physical activity, diet adherence) among patients with CHD?*

We were not able to test for statistically significant differences between all pre- and post- group visit program measures due to our small sample size (n=6). However, we observed significant differences in self-reported physical activity pre and post participation in the group visit program (Table 2), and documented data for the other risk behaviors that can be used further develop and expand the group visit program. There was no difference in medication adherence before and after participation in the three group visits. We were not able to assess smoking behavior because our sample did not include

any current smokers. Three participants never smoked, two quit smoking less than one year before the study, and two quit between 12 and 20 years prior to the study.

We were unable to assess changes in diet adherence due to missing data (five completed the pre-test three day food diary and none completed the post-test food diary). We received valuable feedback about our measure of diet adherence; during telephone follow-up, participants told us that the three day food diary was too cumbersome to complete. Given the difficulties with our diet adherence measure, we also collected qualitative data about changes in diet. Four participants reported changing their diets, including increased fiber and salad intake, decreased salt, calories, and carbohydrate intake, and exchanging red meat for chicken. One participant reported not making any changes in diet.

2. *Does participation in APN-led multidisciplinary group clinic visits result in improvements in risk factor reduction (improvements in LDL-cholesterol, blood glucose, weight and blood pressure)?*

Question 2 focuses on risk factor outcomes; participation in the APN-led multidisciplinary group clinic visit programs may improve risk factor outcomes (Table 2). Improvements in blood glucose, and LDL cholesterol were documented. There were no changes in weight and blood pressure noted. Only improvement in blood glucose was statistically significant (116.75 to 102.75;  $p = .004$ ), but trend for the other risk factors are encouraging, given our small sample size.

3. *What is the feasibility and acceptability of APN-led multidisciplinary group clinic visits in secondary prevention of CHD?*

We collected qualitative data to answer question 3. Overall, participants were enthusiastic about the APN-led group visit program. One participant said that the program “worked very well, very informative, very good experience for me, opened my eyes to other people who had heart problems that were somewhat different from mine and how they are handling it.”

Participants also offered ways to improve the scheduling and logistics of the group visit sessions, such as covering only one topic per session, a bigger room, and scheduling sessions in the

evenings for participants who work. Participants agreed that four 90 minute sessions is an ideal group visit schedule. Participants also had suggestions for the content of the group visits, all of which indicated their general enthusiasm for the program. Participants reported that they would like more information on food choices such as quantity of fiber and portion sizes, and would like individualized exercise prescriptions. They would like more detailed information on their medication regimen, including why they are taking certain medications, and on how to interpret laboratory test results. Participants requested that session speakers use everyday language and not present too much technical information. Balancing the group interaction and the delivery of information was addressed by one participant who said that questions were “nice and people learn from other people’s questions, but maybe keep questions toward the end so finish the lecture first.” One participant stressed the utility of the group aspect of the sessions: “[sessions were] informative and funny, I did not feel alone, liked sharing information, and appreciated the institution’s attempt to help them. Wondered if the participants could have a get-together in about 6 month’s time to see how everyone is doing.” “Keep going and keep up the good work, “ said one participant. None had negative feedback about the APN-led group visit program. Use clinic time at the end only if somebody has concerns; waiting to be seen (8-10 patients) probably will be too long a wait for patients.

### *Costs*

A cost-effective analysis is beyond the scope of this pilot study. However, we estimate that .05 full time equivalent (FTE) would be required for each nurse practitioner, clinical pharmacist, dietician, social worker and the medical assistant to implement an APN-led multidisciplinary group visit program for secondary prevention of CHD. This estimate is based on a program of four 90-minute sessions per group, two groups per month. Additional FTE is needed to include time to recruit or schedule patients and follow up on the phone with participants along with the administrative time for record keeping and charting. Future work should examine the cost per unit change in risk factors (e.g. LDL cholesterol or blood glucose) and potential impacts on hospital and emergency costs. The composition of the

multidisciplinary team should be evaluated; for example, there may be a role for a physical therapist for exercise prescriptions, which could have a measurable impact on referral for outside cardiac rehabilitation services.

#### *Situation analysis*

The DNP student's role in leading and directing the multidisciplinary team was greatly facilitated by the high level of enthusiasm for the APN-led group visit program at the study site. It was not difficult to recruit the multidisciplinary team members: a clinical pharmacist, dietician and social worker who had already been considering starting a similar program. In addition, there was tremendous support from the chief of cardiology and other stakeholders for a program focused on secondary prevention of CHD. The timing with the internalization project (offering cardiac revascularization procedures on-site) came at an opportune time. There was a lot of enthusiasm among the multidisciplinary team throughout the pilot study. The clinic manager also expressed support for the program, and would like data, such as these findings to build a business proposal for the continuation of the group visit program.

The DNP student integrated material from coursework into this program implementation and evaluation of the project. By applying the principles of leadership through communication, relations management, and collaboration with various departments (Stefl, 2008) the DNP student was able to facilitate the multidisciplinary team and other staff to work to attain the organizational goal of excellent patient care in a cost-effective manner. Understanding of the local and regional health care systems and layers of management was also important in putting the project together. The multidisciplinary team emphasized ethical and professional standards when interacting with patients and their families, especially patient confidentiality.

There were no major challenges to recruiting participants. In fact just by word of mouth, other clinicians/providers, health education department and patients from within and outside the clinic were calling to express interest in the program. There is clearly a need and benefit for such a program. The timing of the pilot study during the internalization project (offering cardiac revascularization on site) was

linked to the strong institutional support for the group visit program. The group visits will be eventually incorporated as an option for patients for secondary prevention of CHD, pending a business plan.

### *Outcomes*

Based on the positive feasibility and acceptability results reported above, the participants were satisfied with the group visits and would like the program continued. The next step for the DNP is to work with the institution's business manager in building a business proposal for the APN-led secondary prevention of CHD group visit program. At the hospital institution where the pilot study took place, the project is in the planning stages of implementing group visits for secondary prevention of CHD as an ongoing program. One potential DNP role is to expand the group visit model to include other cardiology services such as congestive heart failure, atrial fibrillation, pacemaker and patients undergoing electrophysiology studies.

## Discussion

*Executive Summary*

**Problem:** There is no formal coronary heart disease (CHD) secondary prevention program on site.

**Situational Analysis:** CHD patients are currently seen individually 2 and 4-week post hospital discharge by allied health providers. Currently, revascularization procedures and cardiac rehabilitation services are referred out to other institutions. A small number of patients are referred and participated in monitored cardiac rehabilitation. An internalization project (offering revascularization services on site) began in April (cardiac surgery) and May (PCI).

**Solution:** A program of advanced practice nurse (APN) – led multidisciplinary group clinic visits (GV) for secondary prevention of CHD was piloted in February 2009 ( $n=10$ ). The multidisciplinary team included a clinical pharmacist, dietician, social worker, nurse practitioner and a medical assistant.

**Findings:** The clinical inquiry study examined whether participation in the GVs resulted in *changes in risk reduction behaviors* (adherence to medications, smoking cessation, regular physical activity, diet adherence), *risk factor outcomes* (improvements in LDL cholesterol, blood glucose, weight and blood pressure), and *feasibility and acceptability of the APN-led multidisciplinary group visits*. The main finding of this pilot study was the positive feasibility and acceptability of the APN-led multidisciplinary group clinic visit program for secondary prevention of CHD by the participants.

Qualitative data were collected and overall, participants were enthusiastic about the GVs and would like the program to continue. Participants stated that the program “worked very well, very informative, very good experience.” They did not feel alone and appreciated the institution’s attempt to improve their care. Participants also offered ways to improve the scheduling and logistics of the GV session.

Participants also had suggestions for the content of the group visits, all of which indicated their general enthusiasm for the program. We were not able to test for statistically significant differences between all pre- and post GV program measures due to our small sample size. However, we observed significant differences in self-reported physical activity pre and post participation in the GVs. Participation in GVs may improve risk factor outcomes. Improvements in blood glucose, LDL cholesterol were documented.

The trend for risk factors is encouraging, given our small sample size. **Successes:** Patients and family/significant others’ accepted GVs; patients “clicked” from the beginning; it was a lively group.

There were no problems in recruitment of patients or members of the multidisciplinary team.

**Difficulties:** Potential participants reported transportation as a barrier to participation, Diet measure (3-day food record) was too cumbersome for most participants. Small sample size and short duration of the study prohibited quantitative assessment of change in risk behaviors and outcomes.

**Strengths:** The chief of cardiology and cardiology staff’s tremendous support and encouragement led to the multidisciplinary team’s enthusiasm, which resulted in high quality performance during GVs. The OHSU faculty mentor’s guidance and support also led to the success of the pilot study.

**Implications:**

Recommend GVs on an ongoing basis for secondary prevention for CHD based on the positive feasibility and acceptability of the APN-led GVs. The next step for the DNP role is to work with the institution’s manager in building a business proposal for the GVs. One potential DNP role is to expand the group visit model to patients on other cardiology services such as GVs for atrial fibrillation and congestive heart failure patients.

### *Context*

The tremendous support from the institution's chief of cardiology, the enthusiasm of the multidisciplinary team and the cardiology staff, and the momentum of the internalization of the revascularization services were linked with the success of this pilot study. There is a clear need for this type of program for secondary prevention of CHD since there is no formal program of this type on site. Program participants reported that they are looking for this kind of cardiac service to be offered at this particular institution.

Previous literature supports the findings of this pilot study supporting that the group visit model as a successful strategy for secondary prevention of CHD. Group clinics have been shown to reduce utilization of the emergency department in the HMO setting through more efficient management of patients with complex health problems (Kaiser Permanente, Southern California region, n.d.). Cardiac patients often have several co-morbidities and risk factors including type 2 diabetes mellitus, hyperlipidemia, hypertension, smoking, depression and anxiety, and are therefore good candidates for the group visit model.

The use of non-physician professionals such as the advanced practice nurses (APNs) have been shown to be cost effective and nurse-led clinics (Page, Lockwood, & Conroy-Hiller, 2005) are effective in improving secondary prevention and facilitating patient lifestyle changes (Murphy, et al. 2005). Future studies should examine the cost-effectiveness of the group visit program pilot tested in this study. Outcomes could include health service utilization and costs, and cost per year life and quality adjusted life year (QALY) gained (Rafferty, et al., 2005). Electronic medical records can facilitate these analyses.

The first month following hospital discharge is the most difficult time for cardiac post-operative patients (Shumaker & Czajkowski, 1994). The goal of secondary prevention and of cardiac rehabilitation programs is improved functioning and to provide information, guidance and support. Despite the

documented 20% reduction in mortality among patients participating in secondary prevention program or cardiac rehabilitation compared to patients who do not utilize these service (Cooper, Cutler, & Desvigne-Niclaus, 2005), there are barriers to cardiac rehabilitation referral and patient participation. The reasons for nonparticipation include lack of physician referral, poor patient motivation, and logistical or financial constraints (Cooper, et al. ; Thomas, et al., 2007). This was also observed in this institution. The group visit model of secondary prevention has the potential to bridge this gap as the cardiology clinicians and primary care providers will become aware of the potential availability of this program on site and its benefits for these patients and their families.

Use of ASA, beta-blockers, ACEI, lipid lowering therapies (statins) lowers the risk of future cardiac events (Cooper, et al, 2005). In addition to medication therapies, lifestyle changes – stress management, physical activity, smoking cessation, weight, and improvement of glucose lower the risk for future cardiac events. Most of the participants were on these cardiac preventative medications. Therefore, medication adherence is a very important aspect in secondary prevention and can be emphasized in the group visit model. Further, the participants will be automatically enrolled into the pharmacy data base for medication management program for continued follow up. As a result, the institution has the potential to successfully meet the national benchmarks for secondary CHD prevention by implementing the evidence-based practice guidelines through the use of group visits and again data can easily be captured through the electronic medical records (EMR).

### *Interpretation*

The main finding of this pilot study is that the APN-led multidisciplinary group visit program is feasible and acceptable to participants (inquiry question #3).Based on the verbal and written data collected at the conclusion of the group visits, participants would like this program to continue and they appreciated the institution's attempt to improve their care. Participants also offered suggestions for future group visits to improve these services. The enthusiasm of the multidisciplinary team contributed to the climate of excellence for this project (Eisenbeiss, Knippenberg, & Boerner, 2008) which led to high

quality performance during the group visit sessions and participants' satisfaction. The overwhelming support of the chief of cardiology, the cardiologists and staff was also evident .

We found significant changes in pre- and post-group visit participation self reported physical activity and blood glucose levels (Table 2), despite our small sample size. In addition, we documented incremental improvements in LDL cholesterol, but no changes in weight and blood pressure. These data and findings can be used for building a business proposal to continue and expand the program. Finally, the feasibility and acceptability of the group visit model is applicable to patients from other cardiac services such as atrial fibrillation, congestive heart failure, and pacemaker, etc.

#### *Limitations*

Our small sample size limited our ability to test key outcome variables. In addition, a longer follow up period may be necessary to see change in risk behaviors or risk factor outcomes. We cannot make any causal inference based upon our pilot results; observed changes could be due to medication or other effects not captured by our study measures and not due to group visit participation. In addition, we have no risk behavior or outcome data on those who chose not to participate, but we do know that transportation and scheduling are likely to present challenges to any expansion of this program. Despite these limitations, this pilot study has demonstrated the feasibility and acceptability of a group visit model for secondary prevention of CHD at this hospital site and as such is an essential first step to expanding and evaluating a full group visit program. Future evaluations should include a control or comparison group to improve causal inference of observed changes.

Future evaluation of this group visit program should aim to simplify measures such as the three-day food record, which proved too burdensome for our sample. Finally, additional measures such as self efficacy should be included in order to evaluate the underlying theory of behavior changes.

#### *Conclusions*

Evidence-based practice requires translating research into practical use (Van Patter Gale & Schaffner, 2008). Studies show that secondary prevention therapies shown to decrease morbidity and

mortality in patients with already established CHD including cardiac rehabilitation are underutilized (Gluckman, 2004). There is no formal secondary prevention program for CHD at this site. This DNP clinical inquiry project, “APN-led multidisciplinary clinic visits in secondary prevention of CHD” incorporates practice innovation through collaborative management, program evaluation and leadership development based on the understanding of organizational culture and the political environment.

Evidence supports the positive impact of programs that provide secondary prevention of coronary heart disease; this site does not currently offer this service. Group visits have the potential to change risk reduction behaviors (adherence to medications, smoking cessation, regular physical activity and diet adherence) and improvement in risk factor reduction (improvements in LDL cholesterol, blood glucose, weight and blood pressure). Group visits offer guidance, information and support during the most difficult transition period, one month post hospitalization after having a cardiac event or revascularization procedure. Group visits also provide support to families and caretakers, teaching them skills to better care for the patients.

This pilot study was successful in determining the feasibility and acceptability of the group clinic visits by the patients and the multidisciplinary team. Per patient reports, they would like to continue this service and appreciated the institution’s attempt to help them. There was a tremendous enthusiasm in the multidisciplinary team therefore promoting a climate of excellence, which fosters high quality performance. The timing of this pilot study was advantageous, coinciding with the internalization project in this particular institution.

This pilot study showed significant improvements in physical activity, and blood glucose. Possibly due to small sample size and short length of follow-up (one month), only incremental changes were noted in LDL cholesterol and improvement in diet adherence. There were no significant changes in weight and blood pressure although blood pressures were already in good control pre and post intervention. Future longitudinal work using control or comparison groups and facilitated by electronic

medical records could provide a better picture of the effects of the group visit program.

Based on the encouraging findings of this pilot study, we propose continuing the APN-led multidisciplinary group clinic visit program. The next step is to develop a business proposal to outline how this program, well-received by patients and providers alike, can become sustainable. In addition, expansion of the group visit model to other cardiac services (congestive heart failure, atrial fibrillation, pacemakers) should be explored. Future research should address the cost-effectiveness of the APN-led group visit model.

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**Table 1. Subject characteristics (N=10)**

|                            |               |
|----------------------------|---------------|
| Age, mean years (SD)       | 61.8 (11.173) |
| Sex: n (%)                 |               |
| Male                       | 9 (90%)       |
| Female                     | 1 (10%)       |
| Marital Status: n (%)      |               |
| Married                    | 6 (60%)       |
| Unmarried                  | 4 (40%)       |
| Race: n (%)                |               |
| White                      | 9 (90%)       |
| Asian                      | 1 (10%)       |
| Cardiac Intervention: CABG | 5 (50%)       |
| n (%)          PCI         | 2 (20%)       |
| Medical Intervention       | 3 (30%)       |

*Note:* CABG = coronary artery bypass graft; PCI = percutaneous intervention;

Medical therapy = these patients did not undergo coronary revascularization procedures (CABG or PCI).

**Table 2. Changes in behaviors and risk factors (n=6)**

|   | Pre-test                         | Post-test      | t<br>(all paired tests) | p-value |
|---|----------------------------------|----------------|-------------------------|---------|
| Risk behaviors                          | M (SD)                           | M (SD)         |                         |         |
| Medication Adherence *<br>(M/SD)        | 3.66*                            | 3.66*          |                         |         |
| Physical activity<br>(Minutes per week) | 105.00(51.96)                    | 197.50 (24.03) | -3.804                  | .013    |
| Risk factor outcomes                    |                                  |                |                         |         |
| LDL cholesterol<br>(mg/dl)              | 100.60(14.46)                    | 82.00 (22.29)  | 1.849                   | .138    |
| Blood glucose<br>(mg/dl)                | 116.75(14.77)                    | 102.75 (12.81) | 8.083                   | .004    |
| Weight<br>(lbs.)                        | 231.93(79.32)<br>Range (125-350) | 232.16 (78.89) | -.242                   | .819    |
| Blood pressure (mm Hg)                  |                                  |                |                         |         |
| • Systolic                              | 117.33 (16.57)                   | 116.67 (7.33)  | .099                    | .925    |
| • Diastolic                             | 65.67 (7.31)                     | 63.33 (7.44)   | 1.557                   | .180    |

Notes. \*The correlation and  $t$  cannot be computed because the standard error of the difference is 0.

As initially proposed, the investigator will accept an increase in  $p$  level of 0.10 instead of 0.05 due to the small sample size, accepting that the study might have a ten percent chance of error.



“Reach high, for stars lie hidden in your soul.  
Dream deep, for every dream precedes the goal”





# **APN-led Multidisciplinary Group Clinic Visits For Secondary Prevention of CHD**

**Presented by: Winnifreda E. Licaycay, ANP, MPH, DNP candidate**

**Date: May 20, 2009**

- Practice Improvement ( 8 week pilot study)
- Program Evaluation
- Outsourcing of cardiac revascularization procedures (PCI, CABG) and Cardiac rehabilitation
- Internalization project
- Secondary prevention

# Background

- First month following hospital discharge – most difficult period
- Structured systematic care/improve levels of secondary prevention of CHD
- Changes in risk reduction behaviors
- Improvement in risk factor reduction

# Background

- Patients with established CHD have a high risk of subsequent MI, stroke (disability), death (Hennekens & Cannon, 2008)
- Risk factor interventions extend overall survival, improve QOL, decrease procedures, reduce subsequent MIs (Thomas, et al. 2007)
- Guidelines/secondary tx are underutilized (Gluckman, 2004)

# Background

- Cost effective interventions for secondary prevention are available
- 2/3 to 3/4 of future CV events could be prevented with consistent use of ASA, ACEI, statin, Bblockers (<20% to >80% of MI patients leaving the hospital w/o BB rx)
- Lowering chol reduces death from CHD by 18-35% (44% had LDL measured, 29% LDL <100)

(Cooper et al. 2000)

# Background

- Smoking cessation and aggressive lowering of BP lowers risks of future events by 4/5 (WHO, 2005)
- DM is an independent risk factor for CHD
- (2004) 1 M survivors of MI, 7M-stable angina, 309,000 CABG, 362,000 PCIs
- (2008) 15 M CAD in US; 2 M cardiac cath annually; 1 M PCI, 350,000 CABG, 14 M remain on med tx

# Background

- Shortened average hospital stay for ACS
- Cardiac rehab benefit 20-25%
- 15-30% receive CR

## Barriers to CR:

- Lack of provider referral
- Poor patient motivation
- Logistics and financial concerns

# Clinical Inquiry Questions

1. Does participation in APN-led multidisciplinary group clinic visits result in changes in risk reduction behaviors among patients with CHD?  
**adherence to medications, smoking cessation, regular physical activity, diet adherence**
2. Does participation in group visits result in improvements in risk factor reduction?  
**LDL-c, blood glucose, weight, BP**
3. What is the feasibility and acceptability of group visits in secondary prevention of CHD?

# Group Visits

- Scheduled visits for a group of patients with similar health problems or concerns under the direction of a physician or other licensed health care professional
- Opportunity to integrate clinical services, education and group support  
1.5 hours – structured and facilitated group interactions, followed by individual focused health assessment/clinical examination
- Multidisciplinary team – MSW, NP, Pharmacist, dietician

# Study Design

- Single group pretest-posttest prospective design
- Group Visits (intervention)
- Collection of data to establish a baseline (pretest) = Y1,
- followed by the intervention (X)
- Data collected again posttest = Y2
- Y1 X Y2

# Study Design

- Question 3 – descriptive, qualitative data collected from participants and multidisciplinary team

# Setting

- HMO, urban setting in the NW region
- Cardiology clinic
- Conference rooms where the HMO clinic is physically located

# Population

Outpatient adults (18+ years) with diagnosis of CHD  
enrolled in cardiology clinic

## **Inclusion criteria:**

- 2 weeks post hospital discharge with dx CHD
- Convenience sample of 12 patients to yield 8-10 participants

## **Exclusion criteria:**

- Patients not able to attend the GV due to medical restrictions
- Patients with severe cardiac disease

# Protection of Human Subjects

- Received IRB approval from 2 institutions:  
1<sup>st</sup> from Kaiser Permanente then  
OHSU waived oversight to KP
- Participants signed consent forms
- Study data stored in locked environment
- Random ID known only to investigator

# Recruitment

- Investigator screened participants for eligibility
- Currently 2 follow up visits (2<sup>nd</sup> & 4<sup>th</sup> week post hospital discharge) by an NP/PA (traditional one on one visit)
- During 1<sup>st</sup> hosp f/u, patients were invited to the group visits instead of the usual 2<sup>nd</sup> hosp f/u visit

# Design of Program & Protocol

| Week 1                   | Week 2<br>(GV 1)   | Week 4<br>(GV 2)   | Week 6<br>(GV 3)                    | Week 8                     |
|--------------------------|--|--|-------------------------------------|----------------------------|
| Recruitment<br>Consent   |  |  |                                     |                            |
|                          | SW (stages of change, MH, action plan)<br>NP (overview of CHD) | RD (heart healthy diet)<br>R Ph (cardiac preventive medications) | Debriefing<br>Focus groups          |                            |
| Pretest<br>questionnaire |  |  | Posttest<br>questionnaire           | Labs<br>Phone f/u:<br>diet |
|                          | Focused<br>exam by NP<br>BP, weight                            | Focused<br>Exam by NP<br>BP, weight                              | Focused<br>exam by NP<br>BP, weight |                            |

# Outcome Variables & Measures

| Outcome Variables         | Measures  |
|---------------------------|---|
| Medication adherence      | Self-reported medication taking scale (Stanford group)      |
| Smoking cessation         | Single item/smoking cessation (AACVPR)                      |
| Regular Physical Activity | Self management behavior/physical activity (Stanford group) |
| Diet adherence            | Three day food record/diary                                 |

# Outcome Variables and Measures

| Outcome Variables                    | Measures             |
|--------------------------------------|----------------------|
| LDL cholesterol                      | Laboratory test      |
| Blood glucose                        | Laboratory test      |
| Weight                               | Clinical measurement |
| Blood pressure (systolic, diastolic) | Clinical measurement |

# Demographics

## Clinical characteristics

age

gender

Marital status

Race

Cardiac intervention

# Sample

- 24 patients – recruited
- 11 patients – signed the consent
- 10 patients attended group visits 1 & 2  
6 (completed the program) group visits 1-3

## Reasons for nonparticipation:

- Transportation issues
- Conflicting schedules
- Uncomfortable in group (2)

# Analysis

- Data entered into SPSS (version 15.0)
- Independent variable – Group Visits
- Dependent variables - medication adherence, smoking cessation, physical activity, diet adherence, LDL-c, blood glucose, weight, BP

# Analysis

## Null hypothesis

- There is no mean difference in medication adherence, smoking cessation, regular physical activity, diet adherence, LDL-c, blood glucose, weight and BP from pre and post intervention (group visits)

# Results

| Table 1. Subject characteristics<br>(N=10)                                   | N(%)   |
|--|--|
| Age, mean years (SD)   | 61.8 (11.173)  |
| Sex:<br>male<br>female   | 9 (90%)<br>1 (10%)   |
| Marital Status:<br>married<br>Unmarried                                      | 6 (60%)<br>4 (40%)   |
| Race:<br>White<br>Asian  | 9 (90%)<br>1 (10%)   |
| Cardiac Intervention:<br>CABG<br>PCI<br>Medical therapy                      | 5 (50%)<br>2 (20%)<br>3 (30%)  |
| Note : CABG = coronary artery bypass graft; PCI = percutaneous intervention; | Medical therapy = did not undergo coronary revascularization (CABG or PCI) |

# Results

| Table 2.<br>Changes in<br>behaviors           | Pre-test<br>M (SD) | Post-test<br>M (SD) | <i>t</i><br>(all paired<br>tests) | p-value |
|---|--------------------|---------------------|-----------------------------------|---------|
| Medication<br>Adherence *                     | 3.66*              | 3.66*               |                                   |         |
| Physical<br>activity<br>(Minutes per<br>week) | 105.00<br>(51.96)  | 197.50<br>(24.03)   | -3.804                            | .013    |

# Results

Question 1 – risk reduction behaviors

Medication adherence – no changes

Physical activity – significant improvement  
over time (7 weeks of intervention)  
between time 1 (pretest) and time 2  
(posttest)

# Results

Smoking cessation – no current smokers

(3 participants never smoked; 2 quit less than 1 yr ago; 2 quit between 12-20 yrs ago)

# Results

- Diet adherence – unable to analyze (missing data) –
- Descriptive report
- “Cumbersome”
- 10 participants in group; 5 completed pretest 3-day food record, 0 returned post test questionnaire
- 4 in 5 reported changes in diet (phone follow up) increased fiber and salad intake, decreased salt, calories and carbohydrate intake, exchanged red meat for chicken.

# Results

| Table 3.<br>Changes in<br>risk factor<br>reduction | Pre-test                            | Post-test     | <i>t</i><br>(all paired<br>tests) | p-value |
|--|-------------------------------------|---------------|-----------------------------------|---------|
| LDL<br>cholesterol<br>(mg/dl)                      | 100.60(14.46)                       | 82.00 (22.29) | 1.849                             | .138    |
| Blood glucose<br>(mg/dl)                           | 116.75(14.77)                       | 102.75(12.81) | 8.083                             | .004    |
| Weight (lbs.)                                      | 231.93(79.32)<br>Range(125-<br>350) | 232.16(78.89) | -.242                             | .819    |
| Blood<br>pressure<br>(mmHg)                        |                                     |               |                                   |         |
| •Systolic  | 117.33(16.57)                       | 116.67(7.33)  | .009                              | .925    |
| •Diastolic   | 65.67 (7.31)                        | 63.33 (7.44)  | 1.557                             | .180    |

# Results

## Question 2 – Risk factor reduction

- Significant improvement in glucose
- Incremental improvement in LDL- c
- No statistically or clinically significant changes in weight and BP

# Results

## Question 3 - Feasibility and Acceptability of GVs

- Enthusiasm of participants and the multidisciplinary team
- Positive comments from participants “worked very well; informative; supportive; very good experience for me; opened my eyes to other people who had heart problems and how they were handling it; I did not feel alone, wondered if participants could have a get together in 6 months to see how everyone is doing”
- Offered suggestions (logistics and scheduling) - 4 sessions instead of 3, a bigger room, offer GVs after clinic hours for patients who work during the day

# Next Steps (Project)

1. Business Proposal to implement on an ongoing basis (sustain the program); determine costs, logistics, possible savings to the department/organization; future outcomes, decrease utilization of ER/hosp services)
2. Expand the GV to other cardiac population (CHF, Atrial fib, pacemakers, etc).
3. Expand the content of the program - Medication Management Program (pharmacist, lipid management, etc.)
4. Evaluation of program outcomes, improve performance, how do we compare to national benchmarks

# Strengths

- Leadership (DNP student)
- Support by the chief of cardiology and staff
- Multidisciplinary team enthusiasm
- Patient enthusiasm
- Timing (program need)

# Limitations

- Small sample size
- Short duration of the study
- Causal inference (med effect vs. group)
- Patients' challenges (transportation, scheduling)
- 3-day food record (cumbersome)

# Conclusions

- DNPs as change agents (practice innovation – collaboration)
- Clinical, organizational, economic and leadership skills (enhanced)
- Input from stakeholders; communication skills and negotiation skills enhanced
- Better practitioner (clinical inquiry, case studies, EBP, informatics)
- High patient satisfaction and enhanced patient outcomes

# Leadership framework

## Transformational leadership

- targeted at change or innovation
- mediated by support for innovation
- moderated by climate of excellence
- enhances supportive behavior for high quality performance

### Key concepts for transformational leadership

- vision, leadership, organizational culture,
- performance improvement systems, information system and resources.

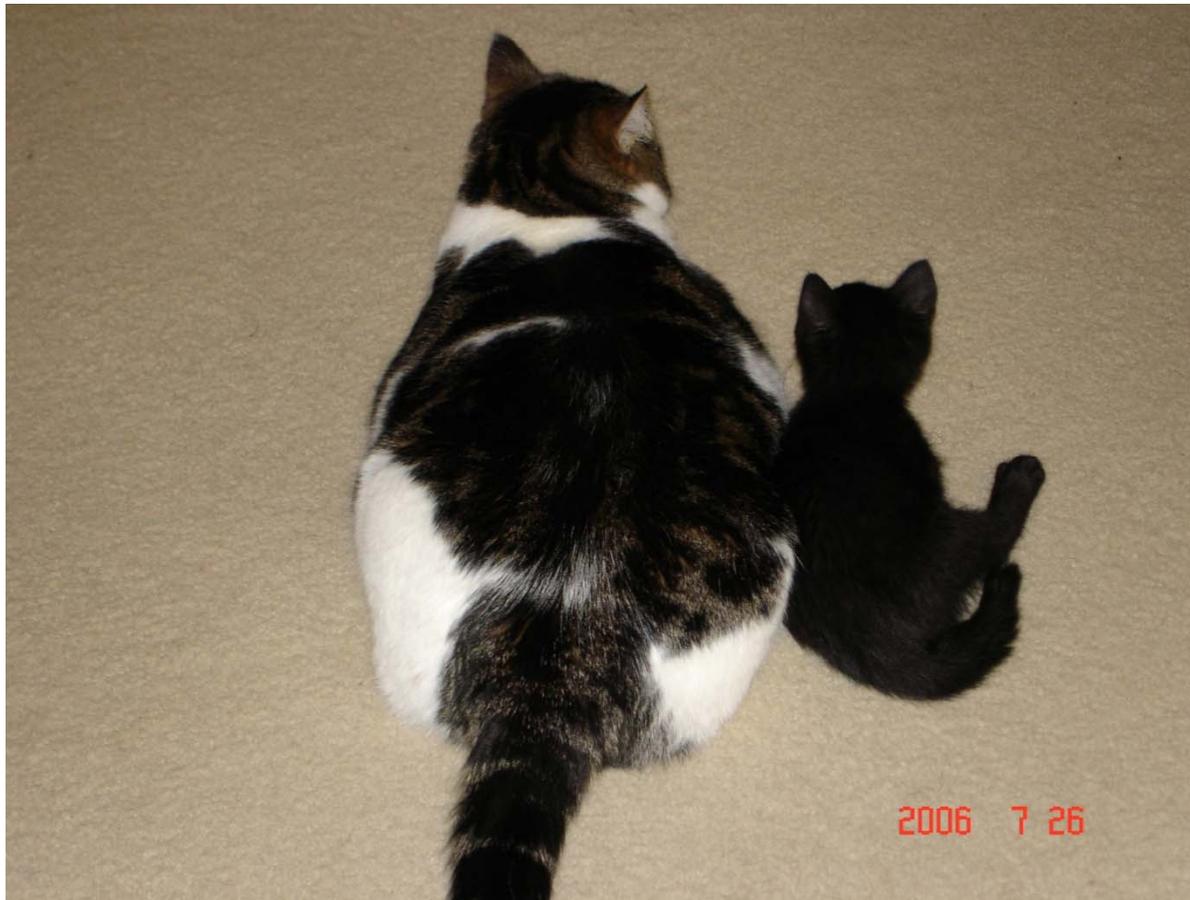
# Accomplishment of DNP competencies

- Develop a change innovation such as a pilot study or an intervention that influences health care outcomes for individuals or population in an advanced practice nurse's (APN) specialty – [skilled & ethical manner]
- **Qualities that a DNP must possess in successful innovation:**
  - Effective team leadership
  - Collaboration with other health care professionals
  - Application of evidence-based practice
  - Understanding of organizational climate(influence policy)

# Future plans

- Inspire others to lead change to improve patient outcomes, to improve work environment and to bring added value to the organization (locally, regionally)
- Continue to enhance clinical skills through EBP
- Clinical inquiry
- Collaboration with other disciplines

“Innovation distinguishes between a leader and a follower.”



# Acknowledgements

- Thanks
- Questions

## **Appendices**

### **1) Data Collection forms**

- **Patient characteristics**
- **Risk Behaviors**
- **Participant Evaluation**

### **2) Consent form**

## **Data Collection Forms**

Licaycay

Study ID Number: \_\_\_\_\_

Age: \_\_\_\_\_

Gender: \_\_\_\_\_

Diagnosis/es: \_\_\_\_\_

Procedure:

CABG: \_\_\_\_\_ PCI: \_\_\_\_\_

Medications:

Statin: \_\_\_\_\_ ASA: \_\_\_\_\_ ACEI/ARB: \_\_\_\_\_ B-blocker: \_\_\_\_\_

Pre-test Data:

BP: \_\_\_\_\_ Weight: \_\_\_\_\_

LDL: \_\_\_\_\_ Glucose: \_\_\_\_\_

GV #1:

BP: \_\_\_\_\_ Weight: \_\_\_\_\_

GV #2:

BP: \_\_\_\_\_ Weight: \_\_\_\_\_

GV #3:

Licaycay

BP: \_\_\_\_\_ Weight: \_\_\_\_\_

Post-test Data:

LDL: \_\_\_\_\_ Glucose: \_\_\_\_\_



Licaycay

During the past week (even if it was not a typical week), how much total time (for the entire week) did you spend on each of the following? (Please circle one number for each question).

None - 0

Less than 30 minutes/week - 1

30-60 minutes/week - 2

1-3 hours/week – 3

More than 3 hours/week – 4

1. Stretching or strengthening exercises (range of motion, using weights, etc.)
2. Walk for exercise
3. Swimming or aquatic exercise
4. Bicycling (including stationary exercise bike)
5. Other aerobic exercise equipment (Stairmaster, rowing or skiing machine)
6. Other aerobic exercise – specify: \_\_\_\_\_

**Smoking:**

Never: \_\_\_\_\_

Recent (quit 6 months ago): \_\_\_\_\_ How long ago? \_\_\_\_\_

Currently smoke: \_\_\_\_\_

Note: Self Management Behaviors: Exercise was developed by the Stanford group (Lorig, et al. 1996).

Smoking cessation measure was derived from the AACVPR criteria (Thomas, et al. , 2007).

Licaycay

Study ID Number \_\_\_\_\_

***Nutrition:***

Please keep a record of your dietary intake (food consumed) including amount below (the past 3 days). You may use additional papers if needed.

Sample:

Day : Tuesday

Date: 10/28/08

| <i>Time</i>      | <i>Food</i>   | <i>Location</i> | <i>Thoughts/Feelings</i> |
|------------------|---|-----------------|--------------------------|
| 7 AM - breakfast | 1 toasted bagel with 1 teaspoon of cream cheese<br><br>1 8 oz. Glass of skim milk | home            | tired                    |

Licaycay

|             |  |                 |             |
|-------------|--|-----------------|-------------|
| 12 PM lunch | 1 large hamburger with French fries, cheese, 1 teaspoon of Mayonnaise<br><br>1 can of soda                           | Fast place food | Pretty good |
| 3 PM snack  | 1 apple  | home            | happy       |
| 7 PM dinner | 1 baked chicken leg with no skin<br><br>1 medium size baked potato with 1 tablespoon of butter<br><br>1 cup broccoli | home            | tired       |

Licaycay

Day 1:

Day: \_\_\_\_\_

Date: \_\_\_\_\_

| <i>Time</i> | <i>Food</i> | <i>Location</i> | <i>Thoughts/Feelings</i> |
|-------------|-------------|-----------------|--------------------------|
|             |             |                 |                          |
|             |             |                 |                          |
|             |             |                 |                          |

Licaycay

|  |  |  |  |
|--|--|--|--|
|  |  |  |  |
|  |  |  |  |

Study ID Number \_\_\_\_\_

Licaycay

Day 2:

Day: \_\_\_\_\_ Date: \_\_\_\_\_

| <i>Time</i> | <i>Food</i> | <i>Location</i> | <i>Thoughts/Feelings</i> |
|-------------|-------------|-----------------|--------------------------|
|             |             |                 |                          |
|             |             |                 |                          |
|             |             |                 |                          |

Licaycay

|  |  |  |  |
|--|--|--|--|
|  |  |  |  |
|  |  |  |  |

Study ID Number \_\_\_\_\_

Licaycay

Day 3:

Day: \_\_\_\_\_ Date: \_\_\_\_\_

| <i>Time</i> | <i>Food</i> | <i>Location</i> | <i>Thoughts/Feelings</i> |
|-------------|-------------|-----------------|--------------------------|
|             |             |                 |                          |
|             |             |                 |                          |
|             |             |                 |                          |

Licaycay

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## Research Study Consent Form

**Title:** APN-led Multi-disciplinary Group Clinic Visits (AMGCV)

**Investigator:** Winnie Licaycay, NP, MPH

### Introduction

Kaiser Permanente Center for Health Research is conducting a study called AMGCV. The AMGCV study will determine whether the group clinic visits work and are acceptable to the patients who have heart disease. This group of patients with heart disease have recently been discharged from the hospital.

### What is this study about?

Currently, patients with coronary heart disease who are hospitalized for a heart attack or who underwent heart bypass surgery or a procedure to open the narrowed artery or blood vessel (called a stent or angioplasty) have two follow-up visits with a Nurse Practitioner. This study wants to know if group follow-up visits are feasible and acceptable to patients with coronary heart disease.

Patients like you are being asked to take part in three post-hospitalization follow-up group sessions over eight weeks. About 8-10 people are expected to take part. A family member or a significant other may be invited to attend the group visits for patient support. A team of medical professionals would provide support and information about your medical condition. In addition to the Nurse Practitioner, the team could include a pharmacist, dietitian, and a social worker. No additional medical procedures would take place that do not normally take place in the individual or "one on one" follow-up visit. You will be given all the same information about your medical condition that you would normally receive.

Licaycay

**How long would I be in the study?**

You would be in the study for eight weeks.

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AMGCV

**What will happen in the study?**

Licaycay

If you decide to join the study, you will be asked to:

1. Sign this consent form.
2. Attend 3 group sessions, one every two weeks for eight weeks. Sessions will last about 1-1/2 hours and will be held on the KP Sunnyside Campus.
3. Answer questions about smoking, physical activity, food intake, and current medications.
4. Answer a few questions about the group experience at the end of the study.

At each group session we will:

1. Weigh you.
2. Take your blood pressure.

### **Are there any risks?**

Confidentiality is an important concern. All patients in this group visits have a coronary heart disease. You might be sharing personal health information with others in this class. You should only share in the group what you feel comfortable sharing. By signing this consent you agree not to share any personal health information that you hear about other patients outside this class. All personal information that is discussed during this class is confidential.

### **What are the benefits?**

Group visit may provide more support and information that is useful. You may also benefit from sharing with others who have coronary heart disease. There is no guarantee that you will benefit from taking part in this study.

Licaycay

**What else can I do?**

You can choose to have two individual visits with your Nurse Practitioner. You can also discuss your options with your doctor.

**Do I have to take part in the study?**

You do not have to be in this study, and you can quit anytime.

If you decide not to be in the study, it will not affect your regular medical care or health

Your doctor's you want to take part in this study. You can quit at any time and you do not have to say why. Not taking part will not affect your health care or your health care coverage.

**What if I am injured?**

Licaycay

If you have an injury that Kaiser Permanente doctors feel is due to this study, Kaiser Permanente will provide care for that injury in accordance with your Kaiser Health Plan benefits, including any co-pays you would normally pay.

### **Who can answer my questions?**

If you have any questions about this study, you can contact the study investigator, Winnie Licaycay, NP, at 503-571-5587. You can also call the Center for Health Research switchboard at 503-224-2400. If you have any questions about your rights as a research study participant or a research-related injury, you can contact David Holt, JD, the Director of Research Subjects Protection, at 503-335-6791.

### **Confidentiality**

Kaiser Permanente is committed to protecting your personal health information. Federal laws also protect your privacy. In order to do this study we will be looking at or collecting information about you and your health including your full medical record.

To protect your confidentiality we will use a study assigned number whenever possible, use codes, use only secure computers or locked files, and destroy records at the end of the study. If information from this study is presented publicly or published in a medical journal, you will not be identified by name, picture, or any personally identifying information.

The researchers in this study will be looking at your personal health information but will not share it with others.

By signing this consent form you agree to let us use your personal health information. If you do not sign you cannot be in the study. Your consent will end when the study is completed.

If at any time you want to withdraw this agreement, you must notify us in writing:

Licaycay

Winnie Licaycay

Mt. Talbert Medical Office  
10100 SE Sunnyside Road  
Clackamas, OR 97015

After we receive your request, only information that has already been looked at or shared will continue to be used, unless we need to monitor your data for your safety.

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AMGCV

Page

**Consent**

My signature means that:

Licaycay

- I want to join this study.
- This consent has been explained to me.
- All of my questions have been answered and if I have more questions, I know who to call.
- I agree to be in the research as described above.
- I will receive a copy of this consent form after I sign it.

---

Participant name (spelled)

Date

---

Participant signature

Date

---

Signature of person obtaining consent

Date

KPNW IRB approved 11/19/08

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AMGCV

Running Head: HEALTH POLICY ANALYSIS

Preventing and Reversing Heart Disease

A Health Policy Analysis

Winnifreda E. Licaycay

Oregon Health & Science University

School of Nursing

## The Context

With increasing health care costs, 47 million uninsured in the United States (US) and 17 million underinsured under the age of 65, presidential candidates for the 2008 election year talk about reforming the health care system (Lewin & Baxter, 2007). The Democratic and Republican candidates do tend to take very different approaches, with the GOP contenders embracing free-market solutions while the Democrats want a stronger role for government (Arnst, 2007).

The Conservative Reagan administration proposed the Medicare price setting reforms, one of the nation's largest governmental regulatory initiatives ever. While Democrat Bill Clinton led to market-based managed care revolution, George W. Bush presiding over the advances of evidence-based health policy and the electronic health record. (Ethenridge, 2007). . According to the 2006 Census Bureau data, about 15% of the population is uninsured. That is a 5% increase over the prior year and the largest increase in four years, even though poverty levels fell and household income rose in that period. The percentage of people covered by insurance through their jobs fell to 59.7 % in 2006, from 60.2% a year earlier, making even those with insurance feel insecure. Health insurance premiums have risen 78% since 2001; four times the rate of wage increases.

The US health care system, is just like the nation, a federalist entity, made up of 51 distinct health-care systems. The states have tremendous authority on how medical care is delivered, monitored, and paid for within their borders. They regulate both hospitals and insurers, deliver public health services such as vaccinations and determine which residents are covered under Medicaid and the State Children's Health Insurance

Program (SCHIP) (Arnst, 2007). Some states are also far ahead of the federal government on health-care reform. Maine and Massachusetts both have universal health-care laws in place, while California and several other states are considering similar legislation (Arnst, 2007).

The Commonwealth Fund, a nonpartisan group that does health research, ranks the health system performance of all the states, and the researchers concluded that Hawaii comes out No. 1 in the rankings while Mississippi and Oklahoma tie for last place. Hawaii had the lowest mortality achieved with 90,000 fewer deaths before the age of 75 annually because it was the first state to expand access to health insurance, back in 1974 when it passed a law requiring all employers to provide health insurance to full-time workers. The Commonwealth Fund also decided to issue a report card on how each state is doing on health care as a tool to identify areas of success and failure. The researchers measured each state on 32 indicators, such as the percentage of people insured, the number of adults who receive screening and preventive care, hospital admissions for people with chronic illnesses, infant mortality, deaths from treatable cancers, and equity-of-care gaps by income and insurance status. The study highlights some of the reasons behind the cost of health care in the US, by measuring avoidable uses of hospitals and medical care. Rates of potentially preventable hospital admissions ranged from more than 10,000 per 100,000 Medicare enrollees in the worse performing states to 5,000 per 100,000 enrollees in the five best. There was also a twofold variation in rates of readmission within 30 days of leaving the hospital. Such rapid readmissions to hospitals are often a sign that care was not delivered optimally for the first time. The researchers estimated that if all states could reach low levels of preventable hospital admissions and

readmissions for Medicare recipients, hospitalization rates for senior citizens alone could be reduced by 30% to 47% and save Medicare \$2 to \$5 billion a year.

National demographic statistics show that the elderly population of this country has increased rapidly and will continue to grow into the twenty-first century as the postwar baby-boomer generation ages. The number of persons age sixty-five and over in the US has grown from 3.1 million in 1900 (4 percent of the population) to over thirty million today (12 percent). Projections indicate 22 percent in 2030 with the aging of the baby boomers. Most of the growth in our elderly population has been fueled by increases in life expectancy from birth, immigration since 1900, and dramatic reductions during the past twenty years in deaths from heart attacks and strokes (Omenn, 1990).

While cardiovascular disease (CVD) death rates in the US are declining, the illness is still the leading cause of death in the nation (American Heart Association [AHA], 2007). CVD has been the leading cause of death in the US every year since 1900, with the exception of 1918 when there was a worldwide flu pandemic. In 2004, the age-adjusted CVD death rate in the US was 288 people per 100,000 compared with 307.7 per 100,000 in 2003. While CVD deaths appear to be decreasing, rates of many CVD risk factors are remaining the same or increasing. The rates of overweight and obesity in adults and in children has been rising for several decades. Sixty-six percent of American adults are overweight, and 31.4 percent are obese. Seventeen percent of youngsters ages 12 to 19 are overweight, along with 17.5 percent of children ages 6 to 11, and 14 percent of children ages 2 and 5. Smoking which increased the risk of coronary heart disease by two to three times is another highly prevalent CVD risk factor. More

than 46 million American adults are daily smokers, and about 4,000 people ages 12 to 17 begin smoking every day (Center for Disease Control [CDC], 2005). United States has increasing rates of diabetes, a major cardiovascular factor. It is estimated that the prevalence of diabetes in the US will more than double between 2005 and 2050 (AHA, 2007).

Cardiovascular disease is increasing in prevalence in many regions of the world, particularly in developing countries and in formerly socialist countries. Worldwide, it is estimated that death from CVD will increase 100% in men and 80% in women from 1990 to 2020, with the majority of that increase coming from Asia, Africa, and Latin America. Similarly, disability-adjusted life years lost will increase 107% in men and 74% in women worldwide. (Benjamin, E., et al., 2002). The reasons for this epidemic are easily identifiable. The 20<sup>th</sup> century saw a dramatic improvement with declines in major infectious diseases and malnutrition in industrialized countries. Associated with longer life span and affluence has been the emergence of chronic diseases that occur among those living past middle age. Changes that were seen in the 20<sup>th</sup> century in industrialized countries are now increasingly observed in the developing world, Technology and the expanding control over the environment have resulted in abundant food supplies in many nations, Industrialization of everyday life with labor saving devices and motor transportation results in a loss of regular physical activity and the assumption of a sedentary lifestyle. The combination of inactivity and surplus calories (particularly from animal products) contributes to abnormal blood lipids and elevated blood pressure (BP) and results in widespread obesity, diabetes, and excessive risk of CVD. Inexpensive

machine-made cigarettes and the social acceptance of tobacco smoking results in widespread nicotine addiction and the many chronic illnesses associated with tobacco. The dramatic changes in the social and economic environment, which are unparalleled in human history, are resulting in massive elevations in both the risk and expression of CVD (Benjamin, E., 2002).

The committee that wrote the 2000 Institute of Medicine (IOM) report on the health care safety net reconvened in 2006 to reflect on the safety net from the perspective of rising numbers of uninsured and underinsured people, the aftermath of Hurricane Katrina, war in Iraq, high immigration levels, and new fiscal and policy pressures on care for vulnerable populations. Safety net providers now participate in Medicaid managed care that finds it difficult to meet the growing needs for specialty services particularly affordable prescription drugs. How current state reforms and coverage expansions will affect care for the poor and the uninsured is a critical issue (Lewin, M., Baxter. 2007).

Diane Rowland, executive vice president of the Henry J., Family Foundation expressed concerns at the IOM meeting that new Medicaid flexibility granted to states under the Deficit Reduction Act (DRA) of 2005 is posing a serious financial threat to safety net providers as grant programs and other payments that traditionally helped these providers subsidize care for the uninsured are now redirected to restructure the Medicaid program. The 2000 IOM report found that the federal government lacked any comprehensive, coordinated ability to track and monitor the changing status of America's health care safety net and the success in meeting the needs of our most vulnerable populations. In response, the Agency for Healthcare Research and Quality (AHRQ) and

the Health Resources and Service Administration (HRSA) launched an effort in 2002 to help track and monitor the changing status of safety net providers. Although their effort was a meaningful undertaking, a limited budget and changing priorities brought the project to a close in 2004.

Health care continues to place demands on American economic resources. Health care spending in the U.S. grew 6.7 percent to \$2.1 trillion or \$7,026 per person in 2006. Health spending accounted for 16 percent of gross domestic product (GDP) in 2006 slightly higher than in 2005. Prescription drug spending growth accelerated in 2006 to 8.5 percent, partly as a result of Medicare Part D's impact. The implementation of Medicare Part D caused a major shift in the distribution of payers for prescription drugs, as Medicare played a larger role in drug purchases than it had before (Catlin, et al, 2008). Private health insurance spending grew at its slowest rate (5.5%) and Medicaid spending Declined for the first time (-0.9 percent) (Catlin, et al., 2008).

Consumer directed health plans (CDHP) have begun to spread, in part as a health care cost containment effort and in part as a benefit buy down strategy, as employers have sought to keep health insurance benefits in some form for their workforce, provide suitable cash wage increases, and keep total compensation on payroll with a defined limit. Despite the exemption of preventive services from cost sharing, in many such plans, critics have continued to predict under-use, based on the fear that people in high deductible plans will reduce their use of all services and will not discriminate between those services that are subject to deductible and those that are not (Rowe, Brown-Stevenson, Downey, Newhouse, 2008). Research findings indicate that these concerns are not valid and that, over time, people enrolled in CDHPs do not under use preventive

services to any greater degree than those in traditional PPOs. Employing smarter cost sharing, in effect makes any disease management program to improve compliance and the health benefit package work together.

### The Problem

Coronary Artery Disease (CAD) remains a leading cause of mortality and morbidity in the U.S., despite the understanding of underlying risk factors, extensive well tolerated drug therapy options and the availability of published practice guidelines for the secondary prevention of coronary heart disease (LaBresh, et al, 2004). Evidence suggests that many patients with CAD receive inadequate treatment in light of clinical evidence and widely publicized treatment guidelines. Failure to achieve clinical treatment goals has been attributed to poor physician adherence to treatment guidelines, patient noncompliance, and the presence of concomitant medical conditions, underlying this has been the absence of a system to ensure adherence as a part of the care process (LaBresh, et al., 2004).

### The Evidence

Nearly 63 million Americans, young and old, live with the effects of cardiovascular disease (CVD). Heart disease and related disorders account for 960,000 deaths each year – the nation's number one killer. The economic losses are more than any disease costing society over \$330,000,000.000 annually in medical costs and productivity. Challenges in combating the disease include persistent geographic, racial, and ethnic disparities, the increased prevalence of sedentary lifestyles, obesity rates and deficiencies in the use of proven and effective treatments for those already afflicted with

cardiovascular disease (Library of Congress, 2004).

A special report by the AHA in 2000 (the National Conference on Cardiovascular Disease Prevention) addressed the issues relating to national trends in mortality and morbidity from the cardiovascular disease. The CVD mortality is still declining in the US as a whole, at a slower rate than in the 1980's. There are striking differences in cardiovascular death rates by race/ethnicity, socioeconomic status and geography. According to the National Center for Health Statistics (2000), blacks have the highest rates of CHD, and non-Hispanic whites also have relatively high CVD mortality. Native Americans, Asians, and Hispanics have lower rates. CVD mortality rates are especially high in middle-aged black men relative to other race/sex groups. Trends in risk factors are consistent with slowing of the decline in mortality. There has been little recent progress in risk factors such as smoking, physical inactivity, and hypertension control. There are increasing levels of obesity and type 2 diabetes, with major differences among subpopulations (Cooper, et al, 2000). Another important cause of CVD death is congestive heart failure (CHF). This disease serves as a fatal sequela of several CVDs, including CHD. Currently there are 4.6 million Americans with CHF, and there are 550,000 new cases annually (Cooper, et al., 2000). There is considerable activity in population-wide prevention, primary prevention for higher risk people and secondary prevention, but wide disparities exist among groups on the basis of socioeconomic status and geography, pointing to major gaps in efforts to use available, proven approaches to control cardiovascular diseases. Trends in population-wide interventions to promote healthy lifestyles indicate that there has been an expansion in the community-wide interventions for CVD prevention. An example is the North Karelia project in Finland,

and in the US, in the early 1970's. Schools, religious organizations and worksites were included. An increasing number of public and private efforts have addressed CVD prevention issues on a national, regional, or local basis since the mid 1980's . As an example of efforts in the voluntary health sector, the AHA developed an extensive series of materials and programs directed at population groups at worksites and schools, at consumers, and at subgroups. At the federal level, the National High Blood Pressure Education Program, the National Cholesterol Education Program, the Obesity Education Initiative and other programs have sought, through education and mass media, to increase awareness, treatment and control for major CVD risk factors and to promote population-wide adoption of healthy lifestyles. In November 1998, the US Congress allocated funds to create a national CVD prevention program at the Centers for Disease Control and Prevention, for tobacco control programs statewide diabetes program and school health programs on tobacco-use-prevention, nutrition and physical activity. All states currently have programs in place to regulate promotion and access to tobacco and to control indoor environmental tobacco smoke (Cooper, et al., 2000), (Khudar, et al., 2007).

On May 16, 2002, the Subcommittee on Labor, Health and Human Services and Education convened a hearing to more closely examine the factors contributing to cardiovascular disease and to explore possible approaches to prevent control and reverse its effects. It was decided by the committee that stress management, in conjunction with diet modification, exercise, and pharmacological and/or surgical intervention, could significantly improve the quality of life for those confronted with cardiovascular disease.

The Senate Report 108-081: Committee on Appropriations mostly funded programs geared towards stress management, for example the fund for innovative education of \$1,000,000 to design programs to teach school children and teachers coping skills to help ease both short and long term effects of stress. The committee also included \$2,897,595,000, an increase of \$103,862,000 over the fiscal year 2003 level to the National Heart, Lung and Blood Institute in conjunction with the Walter Reed Medical Center to conduct controlled prospective randomized trial to compare the outcomes utilizing a demanding vegetarian diet versus a more liberal diet that would also utilize lipid-lowering drugs as well as the impact of relaxation-based stress management programs which will take place over a long period of time to allow a long-term assessment of the outcomes. The committee also expects the Medicare and Medicaid Services (CMS) to conduct a study of the cost savings and quality of care benefits from incorporating stress management in the treatment of Medicare beneficiaries with CAD. The committee also provided \$45,963,000 to increase the CDC's cardiovascular programs by urging the CDC to examine strategies to prevent and reverse heart disease through stress management. To improve the health of racial and ethnic populations through the development of effective health policies and programs to eliminate disparities in health, the committee has provided \$192,824,000 for the National Center on Minority Health and Health Disparities and \$37,561,000 to eliminate racial and their health disparities.

Patients with established CVD constitute one of the risk groups. Secondary prevention involves identifying, treating, and rehabilitating these patients to reduce their risks of recurrence, decrease their need for interventional procedures, improves their

quality of life, and extend their overall survival. (Cooper, et al., 2000), (Manuel, et al., (2006). The Health Care Financing Administration Cooperative Cardiovascular Project has examined the use of aspirin, B-blockers, statin, ACE inhibitors and smoking advice in Medicare patients admitted with myocardial infarction nationwide. (Cooper, R., et al, 2000). Areas in Northeast and Midwest seem to have the higher rates of use and the Southeast and South Central areas of the country have the lower rates of these medications, (Cooper, et al., 2006)

Another nationwide concern is the severe under use of cardiac rehabilitation, despite its association with a 20% reduction in mortality. Approximately 15% to 30% of acute myocardial infarction patients receive cardiac rehabilitation. Reasons cited for nonparticipation include a lack of physical referral, poor patient compliance, and logistical or financial constraints (Cooper, et al., 2000).

Healthy People 2010 is the federal government's prevention agenda for building a healthier nation. It is a statement of national health objectives designed to identify the most significant preventable threats to health and to establish national goals to reduce these threats. (CDC, n.d.). It is designed to achieve two major overarching goals – to increase the quality and years of Americans' healthy life and to eliminate disparities in the burden of disease.

To restore and even accelerate the decline in CVD mortality and to achieve the Healthy People 2010 Objectives for CVD, the National Conference on CVD Prevention concluded that the essential strategy for the prevention and control of this epidemic should be as follows:

1. A comprehensive, population-wide approach that especially emphasizes

primary risk factor prevention and risk factor detection and management.

2. Attention to all population subgroups, especially those at higher risk.
3. Mobilization of the considerable multifaceted resources needed to implement this strategy effectively.

### The Policy Options

The evidence and the contextual features support the consideration of 3 policy options.

The first option is the provision of the medications proved to shown effectiveness in the management and prevention of CAD. This is in support of the Chronic Disease Management Program as part of the Healthy Americans Act, which was introduced in Senate (S. 334) in conjunction with the SEC. 431 – Negotiating fair prices for Medicare Prescription Drugs. This ruling ensures that beneficiaries enrolled under prescription drug plans pay the lowest possible price. The Secretary shall have the authority similar to that of other Federal entities that purchase prescription drugs in bulk to negotiate contracts with manufacturers of covered part D drugs, consistent with the requirements and in furtherance of the goals pf providing quality care and containing costs under this part.

The second option is the nurse-managed health clinics. This is in support of the Nurse-Managed Health Clinic Investment Act of 2007 (S 2112) to amend the Public Health Service Act. Nurse-managed health clinics (NMHCs) offer their patients primary care based on the nursing model which emphasizes the protection, promotion, and optimization of health along with the prevention if illness, and the alleviation of suffering in conjunction with diagnosis and treatment. This option is also in conjunction with the

Medicaid Advanced Practice Nurses Access Act of 2007 (H.R. 2066), which amends title XIX of the Social Security Act to improve access to advanced practice nurses (APNs) under the Medicaid programs.

The third option is the strengthening of the state legislation on childhood obesity Policy of 2005. Being overweight puts children and teenagers at greater risk for developing Type 2 diabetes – risk factor for heart disease at an earlier age. This proposed policy will require the shifting of resources to appropriation of funds to strengthen the Healthy Kids Project by incorporating the evidence and the experience of the success of the North Karelia Project in health promotion.

#### Outcomes and Evaluative Criteria

The outcome of the first option will fully implement the secondary prevention guidelines. The guidelines currently recommend Aspirin, Clopidogrel (for twelve months), beta-blockers, angiotensin-converting enzyme inhibitors (ACE), and statin. The evidence supporting the efficacy or each of these drugs is derived from placebo-controlled, single-drug trials, at each intervention reduces risk and improves survival, the residual risk becomes less and less, with less cost-effectiveness. Recent proposals for combination of generic drugs into a single pill, so named the Polypill are attractive because of very low drug costs with improvements in compliance and safety (Pearson, 2007). Cost of the multiple drugs required in secondary prevention is often cited as a barrier to compliance, at even 81 mg of aspirin, available without prescription for pennies per day has a 10 percent or greater noncompliance rate.

The outcome of the second option would strengthen the nation's health care safety

net and ensure that the medically underserved have greater access to primary care services. By providing accessible, high quality, comprehensive primary care services to populations who have trouble accessing care, NMHCs reduce disparities. Serving medically underserved urban and rural areas. Many NMHCs operate in areas suffering from health professional shortages. NMHCs, meets the IOM's definition of safety-net provider, provision of care to low-income, minority, homeless, and migrant families, and are often located near public housing developments, schools, churches, community centers, and shelters.

The outcome of the third option will strengthen the state legislation on the policy of childhood obesity. In 2005, legislatures have been very active in considering policy options to address the obesity epidemic. Aiming to start early to prevent the onset of chronic conditions will facilitate opportunities for a healthier diet and more exercise beginning in childhood.

#### Weigh The Outcomes

Drug treatment to prevent heart disease events and stroke has generally been limited to single risk factors, to targeting the minority of patients with values in the tail of the risk factor distribution, and to reducing the risk factors to "average" population values. This policy option can achieve only modest reduction in disease. A large preventive effect would require intervention to everyone at increased risk irrespective of the risk factor levels; intervention on several reversible causal risk factors together, and reducing these risk factors by as much as possible. (Wald, & Law, 2003). This strategy will prevent CVD based on the three principles and quantify the overall preventive effect, A daily treatment, the Polypill comprising six components, each lowering one of the four

risk factors would prevent more than 80% of the ischemic heart disease (IHD). The polypill strategy could largely prevent heart attacks if taken by everyone age 55 and older and everyone with existing cardiovascular disease. It would be acceptably safe and with the widespread use would have a greater impact on the prevention of heart disease. The statins (cholesterol lowering medication) will decrease IHD by 61% and stroke by 17%. The blood pressure reduction with three drugs in combination will reduce the incidence of IHD by 46% and stroke by 63%. Low dose aspirin will reduce IHD by 32% and stroke by 16%. About 1 in 3 people would directly benefit, each on average gaining 11-12 years of life without a heart attack. A low cost pill can use generic components. The polypill may not be suitable for all people, but even if about 10% of people were intolerant of the formulation, it would still have a considerable merit (Wald, & Law, 2003).

The Balanced Budget Act (BBA) of 1997 was designed to reduce Medicare reimbursements by \$116.4 billion from 1998 to 2002. The impact of reimbursement policy changes on quality care has been seen in state-level where the uninsured, whose care is funded largely from hospital margins, appears to be the most vulnerable group, especially those who have suffered Acute Myocardial Infarction (AMI). There is also evidence that cuts in reimbursement can affect quality of care. Reductions in Medicaid reimbursements affected the number of services to a greater degree (Volpp, Kontzka, Zhu, Parsons, & Peterson, 2005). But with this drug ruling, this will ease the problem. The primary outcomes of systematic reviews of nurse-led clinics are optimization of the management of CHD in the current economic and social-political climate, improved management of cardiac risk factors by providing nurse-led services to divert patients from busy hospitals and general practice settings, cost effectiveness and

consumer satisfaction. (Evidence based Practice, 2005). Although the intervention was less intensive than the standard cardiac rehabilitation, this approach had an impact on health and hospital admission rates (Campbell, 1998). The Nurse led cardiac clinics reported to include a focus on health rather than illness, and an emphasis on management (Briggs, 2006).

The third policy option of controlling childhood obesity, the community or population approach may be utilized to a certain degree which is similar to the North Karelia project which was launched in 1972. This program was formulated in cooperation with the local and national authorities and experts as well as with the World Health Organization to implement a preventive intervention to reduce the risk factors in the population. In the US some states have already considered or enacted legislation related to the nutritional quality of school foods and beverages. There are also some states which have considered or enacted student body mass index legislation in school wellness progress. Non-invasive screening risk analysis of school children for diabetes was enacted in some schools beginning in 2003 along with nutrition content information for school foods. Forty eight states continue to require physical education in schools but the scope of the requirement varies. The federal Child Nutrition and WIC Reauthorization Act of 2004 (Public Law 108-265) requires each local school district participating in the National School Lunch and/or Breakfast Program to establish a local wellness policy by the beginning of the 2006-2007 school-year (National Conference of State Legislatures, 2008). The keys to success in the North Karelia project which might be applied to this third policy option was community organization: working within the community with its numerous organizational and with strong people's involvement. Within the overall

science-based framework the intervention was flexible, based on continuous monitoring and feedback. The intervention used multiple strategies: from innovative media and communication activities and systematic involvement of primary health care (especially general practitioners and public health nurses), to environmental changes, collaboration with food industry and policy changes. The project worked in close collaboration with national authorities; its activities benefited from and contributed to national health policy (Puska, P., n. d.)

### The Decision

Based on the information and findings noted in the above discussion, the most viable policy alternative is option number 2, which is in support for the adequate reimbursement of the APNs. To manage the CHD clinics. According to the CDC (2008), the projected cost of CHD is staggering at \$151.6 billion in combined direct and indirect costs in 2007 and continues to rise which greatly impacts the nation. On average, someone in the U.S. suffers a heart attack every 26 seconds and every minute someone dies of a heart attack. For those who survive the heart attack, the risk of having another cardiovascular event and its complications, for example, CHF leads to another expensive problem and subsequent patient disability. The average number of years of life lost due to a heart attack is 14.2 years. Federal and statewide programs are available in reducing CHD risks, evidence-based guidelines are accessible to providers, however, and provider and patient noncompliance of these guidelines remain an issue. With the decreasing federal health care budgets especially with Medicare and Medicaid including the prescription drug coverage for the effective treatment of heart disease, health disparities exist. Frakes & Evans (2006) stated that in 2003, the federal government spent \$271

billion on Medicare services representing 13% of the federal budget. The federal government has a significant interest in controlling health care costs and via legislation, has a powerful forum from which to do so. APNs are among providers affected. Cost regulations impact patient insurers and the government.

Implementing a telemanagement program directed by an APN after hospital discharge decreased the cost and frequent re-hospitalizations associated with heart failure and improved the patients' quality of life. The APNs have a more significant impact on the outcomes of patients who use the services provided in the comprehensive discharge programs. An APN-directed heart failure telemanagement program can reduce the healthcare costs that result from frequent hospital readmissions, thereby reducing the costs of the hospital institutions (Delgado-Passler, & McCaffrey, (2006). In light of the above arguments, bridging the gap by using the APNs as an effective solution is a consideration and this will also support one of the goals of the Healthy People 2010 and the AHA national recommendation for the cardiovascular disease prevention which is the implementation for strategies to reduce the risks of populations and individuals through risk factor modification, effective use of treatment, follow up and surveillance, case management, use of accessible rehabilitation program and especially targeting the poor and those who live in rural areas. However, having achieved the ability to obtain direct reimbursement under an individual Medicare provider number future APN reimbursement issues now generally parallel those of physicians. The notable exception is the continued existence of the two-level fee structure. While APNs can receive 100% reimbursement for incident to services, they cannot do so independently. This impedes the formation of independent practices. Particularly as relative work values and outcomes

are equal between the two provider groups, progression to equal reimbursement rates for APNs and physician providers regardless of the setting is a legislative goal for some APN organizations. One Medicare reimbursement area becoming increasingly important for both physician and APN providers is reimbursement for telemedicine service. APN reimbursement for those services will be complicated by vagaries of state to state APN regulation of electronic services that easily cross geographic boundaries.

In non-Medicare arenas, the key issue for APNs is expansion of recognition to match that provided under the Medicare rules. Currently APNs are not eligible for reimbursement under the Federal Workers Compensation rules or some state Medicaid and private insurance programs (American Academy of Nurse Practitioners, 2004).

Nurse-led prevention clinics improved medical and lifestyle components of secondary prevention and this seemed to lead to significantly fewer total deaths and probably fewer coronary events. (Murchie, Campbell, Ritchie, Simpson & Thain, 2003). Secondary prevention clinics should be started sooner than later.

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Running Head: ETHICAL CASE AND DILEMMA

Ethical Case and Dilemma: Analysis of Philippine Culture

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## CASE AND DILEMMA

Maria is a 75 year-old active Filipino woman who immigrated to the United States 5 year's prior, with history of diet-controlled diabetes mellitus, untreated hyperlipidemia, hypertension, presents to the emergency room accompanied by husband, complaining of 3 days of dizziness.

She is a retired elementary teacher in the Philippines. She has 5 children. Four of them are residing in the Philippines. She now takes care of her 3 and 6 year old grandchildren. From her youngest son. She is currently living in a senior community with her husband and are under the SSI and Oregon Health Plan.

One week prior to presentation, she experienced almost daily nagging toothache. Medications included HCTZ 25 mg 1 tablet everyday, Aspirin 81 mg 1 tablet once a day.. Motrin 400 to 800 mg one tablet three times a day for pain as needed for the past week with minimal relief.

In the emergency room she was found to be orthostatic with blood pressure from 120/70 supine to 90/60 standing, pulse was weak at a rate of 120 /min. She was afebrile. She had a negative neurological findings. She had no chest pain but was still complaining of a toothache, pointing to her left jaw, relieved with Nitroglycerine spray. Her 12 lead EKG was normal, but her troponins were mildly elevated. Her hematocrit was 26 (normal is 36-42).

Her troponins normalized after 24 hrs of hospital admission. She received Intravenous fluids and 2 units of blood. She was treated for Acute Coronary Syndrome, which was precipitated by gastrointestinal bleed. Once she was stable, she underwent cardiac catheterization which was significant for a three-vessel disease including a critical left main disease.

It was decided by the cardiology team that she needed a Coronary Artery Bypass Graft (CABG). Her hematocrit has normalized.

In the interim, consent for the CABG was obtained along with the discussion of Code status. She decided that she would want a Do Not Resuscitate (DNR) order. Her husband and son adamantly disagreed, and they discussed this with the Nurse Practitioner to help the patient change her mind. Maria made it clear with the Nurse Practitioner that she did not want any heroic measures and even stated that she will just let God decide her fate.

After a long discussion with the Nurse Practitioner and her family, Maria was able to obtain a temporary hold on the DNR status during surgery. Maria hesitantly agreed to have it reinstated after the surgery. The surgery was successful. She underwent usual immediate post-operative care and was finally transferred to the step down unit. However, on the third post-operative day, her hematocrit started dropping precipitously. She was getting weak and was in and out of consciousness. Should the Nurse Practitioner maintain the temporary Full Code status or honor the patient's wish to return to Do Not Resuscitate status?

## **REVIEW OF TOPICS**

### **MEDICAL INDICATIONS**

Maria has the risk factors for Coronary Artery Disease (CAD) namely hypertension, hyperlipidemia, and diabetes mellitus. She has been experiencing jaw pain which was actually an atypical angina, which she has mistaken as a dental pain. She took Motrin, which caused gastrointestinal bleeding and precipitated an Acute Coronary Syndrome (ACS).

She was admitted to the intensive care unit (ICU). Twenty-four hours later, her condition stabilized. She received IV fluids and blood transfusion along with Nitrates and Beta-blockers

for her ACS and was monitored for complications like arrhythmias. She then underwent a cardiac catheterization, which revealed significant diffuse CAD including a critical left main disease. Left ventricular (LV) ejection fraction was 40% (normal is 55- 60%). The cardiologists decided that she needed a CABG.

CABG is the technique of choice for 3-vessel disease and depressed LV function and left main coronary disease. CABG can benefit outcome in symptomatic significant L main disease and diffuse disease not amenable for treatment with percutaneous coronary intervention (PCI). Overall mortality is around 2.8% but rises to 3.7% to 12% for emergency procedure (Ashley, 2004).

Complications include infection, deep vein thrombosis, anesthetic complications such as malignant hyperthermia, myocardial infarction, acute renal failure stroke from hypo-perfusion, early graft occlusion or graft failure, stenosis of the graft, chronic pain at incision sites, post-operative stress related illness (Rihal, 2003).

The surgery was successful: however, on the third post-operative day, her hematocrit started dropping precipitously. Her blood pressure was dropping. She was complaining of weakness and was in and out of consciousness. She was having numerous ventricular arrhythmias and became hemodynamically unstable. Blood transfusion was restarted. Upper and lower endoscopy was performed, showing ulcers, which were then treated. She finally was discharged 1 week later in satisfactory condition.

#### PATIENT PREFERENCES

Maria was mentally and legally competent when she presented to the emergency room, prior to the surgery and post-operatively. She was given adequate information on possible risks

and benefits of the surgery. She was cooperative with the treatment plans with the exception of the code status – she chose to have a Do Not Resuscitate order because her best friend had the same CABG surgery and subsequently went into shock, was resuscitated, but unfortunately ended up in a vegetative state and respirator dependent. She refuses to be in the same situation.

Her cultural and religious background also plays a role in her choice of code status. She states that she will let God decide her fate, thereby she does not want heroic measures. She has a close relationship with her husband and her family. She does not want to disappoint them so she hesitantly agreed to hold off on the DNR status during the surgery but compromised on having it reinstated thereafter.

However, on the third post-operative day, she had complications and became unstable from GI bleeding, she was in and out of consciousness. There were times when she was mentally incompetent at this time. Her husband served as the surrogate. He and his son were opposed to the DNR status and wanted a FULL CODE for Maria.

In the Western society, one would conclude that the patient's rights were not fully respected in this case. The patient actually did want the DNR order to be written and did not want life support measures; however, the family and the Nurse Practitioner gave some arguments about doing otherwise and to prevent disagreement, patient changed her mind to temporarily hold the DNR order during surgery.

## QUALITY OF LIFE

Maria is an active 75 year old. She lives with her husband in a senior facility. She does a lot of gardening, She baby-sits her grand children ages 3 and 6 from 9am to 3pm during the weekdays and helps out in the kitchen for the “meals on wheels.” During the weekend she is

active in church as a Eucharistic Minister and other church activities on Sundays, and is active with the senior group teaching folk dances. In the summer, she goes home to the Philippines to be with her other children and her grand children.

Uneventful surgery would have her resume her normal active life, assuming that she participates in risk modification regimen to avoid complications of CAD. Studies show that prognosis post CABG is good for at least 10-15 years and improves the chances of survival of patients who are at high risk (those presenting with ischemic symptoms). She did survive the surgery but then developed shock and if CPR was withheld on post-operative day 3, then she probably would have not been alive at this time.

#### CONTEXTUAL FEATURES

There are family issues that have affected her care. Her family disagreed with her choice of DNR status. They sought the help of the Nurse Practitioner in influencing Maria to change her mind regarding the code status during the surgery to Full Code.

Religious and cultural factors and her friend's medical experience have played a role in her choice of code status. In the Philippine culture, the family greatly influences the patient's decisions about health care. Harmony is valued and personal needs are secondary to keeping group harmony. Individual choices come second to family decisions. The role of the family, loved ones and friends is of fundamental importance for Filipinos. Separation from family, loneliness, and incurring shame to the family can create chaos and exacerbate illness behavior (Becker, 1998).

The most central Filipino concept is that of balance. Health is the result of balance and illness is the result of some imbalance (Anderson, 1983). Some of the causes of imbalances are

caused by social and emotional stress, anxiety, grief or loss of self-esteem. For Maria, all those factors have been present. Filipinos often do not respond to illness until they have become advanced. They tend to minimize the seriousness of illness. They concentrate on the signs and symptoms to see how they evolve prior to seeking medical help. For Maria she had to self-treat with Motrin, not realizing that it was angina. Some think that it is shameful if they go to the hospital early without self-medicating. Some Filipinos resort to physicians and surgeons for their care, others are also treated by home remedies, folk practitioners and faith healers.

Filipino immigrants to the US are predominantly Catholic. Religion is important in shaping values and can help explain views toward death. In terms of crisis, patients may return to religious traditions. Filipinos look upon God to decide one's fate and survival. Some Filipinos think that illness could be a punishment from God, and thus it would not be appropriate to interfere with God's plans.

Maria is on SSI and Oregon Health Plan and her health insurance is dependent on whether she qualifies for any of these. Since she did not work in the United States she is not Medicare eligible. She was worried that if the surgery is not successful or if she turns out to be in a vegetative state like her friend, she will be a burden to the society and her family. Therefore, she chose a DNR status in the first place.

### **CASE ANALYSIS AND RECOMMENDATIONS**

There are several issues in this case that warrant discussion: This was a case wherein a competent patient was refusing a potentially life sustaining treatment which was the Full Code status during hospitalization including intraoperatively. When she became unstable 3 days into

the post-operative period and became incompetent her family acted as the surrogate and demanded a full code status.

**1. Is the Nurse Practitioner justified in her paternalistic approach to provide beneficent treatment by overriding the patient's wishes?**

The paternalistic approach assumed that patients and providers had the same goals, that providers could accurately judge patient preferences, that the physician had the expertise necessary to determine what should be done and that it was appropriate to spare the patient's worry of decision making or even to deceive them in order to engender faith, reassurance and hope (Elliott 2001).

**2. Is patient's autonomy respected?**

Filipino and other cultural groups do not place the same emphasis on patient autonomy that Western society does (Becker, 1998)..

**3. What is the impact of culture/religion in ethics?**

Cultural factors affect the patient's views of health and management of illness. Religion is important in shaping the values and sometimes provide explanation of differing views toward illness, health and death.

**4. What are the elements of Informed consent?**

Nature of the decision and procedure, reasonable alternatives to the proposed

Intervention, relevant risks and benefits and uncertainties related to each alternative, assessment of patient understanding and acceptance of the interventions by the patient are the elements of informed consent.(University of Washington, Ethics in Medicine).

In order to the patient's consent to be valid, she must be considered competent to make the decision at hand and her consent must be voluntary.

If a patient is determined to be incapacitated or incompetent to make health care decisions, a surrogate decision maker must speak for her.

**5. Question whether the DNR orders should be suspended automatically during anesthesia or surgery.**

The major professional associations of surgeons, anesthesiologists and nurses endorse the policy (and recommended by Jonsen,et.al 2006) that a specific discussion about DNR should occur between the attending physicians and surgeons and the patient or surrogate should either affirm or suspend the order in anticipation of surgery. If a competent patient after reconsideration wishes a preexisting DNR order to stand, resuscitation should not be attempted in the event of intra-surgical arrest.

Another approach is to develop DNR order that lists the goals of the patient that permit the surgeon and anesthesiologist to use their clinical judgment to try to achieve the patient goals. For example, is the patient fears anoxic brain damage and experiences ventricular tachycardia promptly corrected by cardioversion, the patient's goal of avoiding brain damage will be met. Alternatively, if the patient experiences 15 or more minutes of cardiac arrest secondary to an intra-operative myocardial infarction, the

surgeon or the anesthesiologist may stop CPR to respect the patient's wish not to survive with neurologic damage (Jonsen, et. al 2006).

**6. What if the CPR is not futile but patient wants a DNR order?**

If the patient is mentally and legally competent and fully understands her condition, then the principle of autonomy should be followed.

**7. What if the family disagrees with the DNR orders?**

Effective communication is the key factor in resolving this issue, however if there is a continued disagreement between the family, patient and the provider, then an ethics consultation may be helpful.

**8. Recommendations when discussing DNR orders with patients from any culture:**

It is best to explore the following issues:

What do they think about the sanctity of life, what is their definition of death, what is their religious background and how active are they currently, what do they believe are the causal agents in illness and how do these relate to the dying process, what is the patient's support system, what makes decisions about matters of importance in the family? (Klessig,1992).

**ETHICAL ESSAY**

In our everyday clinical practice, we are occasionally faced with ethical dilemmas. What we might consider a right decision may not be good for all patients. When faced with these

difficulties, we take a moment to ponder, and ask ourselves and think of who we are, what is our role? What are we faced with? What are our values? Who are involved, what are their values? There will be instances wherein providers, patients and family disagree about the choices that challenge their values, leading to ethical dilemma.

In searching for the right answers we should always refer to the basic ethical/moral principles by Beauchamp and Childress, which are Autonomy (respect for persons), beneficence (to do good), nonmaleficence (avoiding harm, maximizing possible benefits and minimizing harms) and justice (fairness in distribution). In working through the difficulties it is important that we analyze the topics by Jonsen, et al which are medical indications, patient preferences, quality of life and contextual features to arrive at a reasonable decision.

We have to be cognizant of the fact that not all people are the same. People are of different cultures and they have their own belief systems and coping strategies. Cultural competence and effective communication are attributes of ethical multiculturalism.

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Running Head: ORGANIZATIONAL CHANGE EFFORT ANALYSIS

Organizational Change Effort Analysis of Non-physician Providers Performing

Pharmacologic Cardiac Stress Testing

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## INTRODUCTION

Health care organizations are struggling to keep up with membership needs, customer satisfaction, growing revenue, political shifts, emergent informatics/technology, and addressing culture within the workplace. Therefore, organizational goals have been to improve access, patient satisfaction, quality of care and cost.

As an HMO (health maintenance organization), our company is constantly reviewing the best product for the best price, including our formulary medications, state of the art in imaging and information technology, and employee training. There are focus groups working on different projects developing guidelines, which are in line with the national evidence-based practice. However, quality of care and customer service is just as emphasized as cost containment and profitability. The CEO is committed in instilling in us to do our best as employees. There is a constant peer review process, annual evaluations and random patient survey of providers.

This problem addresses the organizational effort of how to deal with quality of care and cost within Pharmacologic Cardiac Stress Testing. There is inconsistent availability of trained professionals to provide service to do pharmacological cardiac stress testing in one of the current satellite clinics. The proposed change effort carried out used the process of LEAN thinking: an approach to an organization of complex processes that was derived from industrial manufacturing experience, which is the practice of starting not with a potential solution but with the development of a detailed understanding of how a complex process is actually undertaken (King, D., 2006). The change initiated that the Cardiology department now provides the service instead of the Nuclear Medicine Department. The desired outcome provides consistency of professional service by dedicated providers (provider satisfaction), patient safety (quality of care) and cost benefit.

## **Background of the Problem**

Currently, the Nurse Practitioner (NP) performs outpatient stress tests in one of the satellite clinics, physically located at the Nuclear Medicine room, although technically part of the department of Cardiology. Communication between the cardiology mentors at the hospital (approximately 15 miles away) is through telephone and use of fax machines for EKG review. There is an emergency room (ER) on the same floor should complications of stress testing arise. In addition, there are two Nuclear MD's (with an Internal Medicine background) performing the pharmacologic stress testing as well as interpreting the nuclear images for the past 10 years.

However, the various levels of management within satellite clinic's Nuc Med room created problems. There are unit managers, who manage patient care, the manager for the department of cardiology, yet another manager for the nuclear medicine department, and finally the operations manager. Unfortunately, such managers are shifted around the department or location where mostly needed to keep up with the organizational goals, which created shifts in philosophy and reorganization. Therefore, in Dec. 2006, the top-level managers decided that cardiology department would take over the service instead of the Nuclear Medicine and the NP will be replacing the MDs in performing the pharmacologic stress tests and an RN (registered nurse) will be hired to replace the NP. The NPs were provided the mandate along with the rationale for this impending change and were to do the change as soon as possible.

Although the concept seemed initially beneficial, there was a problem with the process. As the NP and one of the key players at the satellite clinic – including the unit manager and the nuclear technicians – I felt we were not included in the planning stage and it was up to us to figure out the rest of the steps. I ended up coordinating the change process within the unit with the help of my unit manager. We identified that communication was an issue so we set up an

interdepartmental meeting including the operations manager, middle management, the chief of cardiology and the nuclear department.

### **Review of Literature**

The granting of clinical staff privileges is one of the primary mechanisms used by institutions to uphold the quality of care, as required by the Joint Commission on Accreditation of Healthcare Organizations. (Rodgers, G., 2000). American College of Cardiology (ACC), American Heart Association (AHA), American College of Physicians-American Society of Internal Medicine (ACP/ASIM) Task Force on Clinical Competence was formed in 1998 to develop recommendations to attain and maintain the cognitive and technical skills necessary for the competent performance of a specific cardiovascular service, or procedure. The documents are evidence based, and when evidence is not available, expert opinion is called upon to formulate recommendations. (Rodgers, G., 2000).

Continued competence in pharmacologic stress testing requires that studies be performed on a regular, ongoing basis. Maintenance of competence includes knowledge of appropriate indications and contraindications of the Pharmacologic stress test, knowledge of complications and ability to recognize and appropriately treat complications of the vasodilator or adrenergic-stimulating agents, competence in cardiopulmonary resuscitation and successful completion of an AHA sponsored course in advanced cardiovascular life support and renewal on a regular basis, knowledge of electrocardiography and changes that may occur in response to the drugs used, cardiac arrhythmias and their treatment (Rodgers, G.,2002), (Franklin, 1997).

Because exercise testing entails a very small but definite risk [1 myocardial infarction or death per 2500 tests], it should be performed only by properly trained physicians or non-physicians with appropriate cognitive skills and safety training measures (Rodgers, G., 2000).

## ANALYSIS

In order to explore an effective organizational change within health care delivery, one must understand it through a systems theory or a systems way of thinking (Cusins, P., 1994). Bronfenbrenner's (1979) ecological environmental framework can be examined and applied to see how the Global and Organizational Model can help identify patients and care into specific system. Therefore, one can apply the current problem of reorganization to each model and see where the breakdown of communication and care exists.

The **Global Model** includes: 1) *Internal Systems*: patients who are undergoing stress tests. 2) *Microsystems*: NP/ PA's (physician assistant), RNs, (MA) Medical assistants, Nuclear technologists, appointment schedulers with whom patients get in contact, primary care providers or ordering physicians, 3) *Mesosystem*: nuclear medicine clinic where they get the tests, preparation for the test – patient needs to fast, diabetic patients who are dealing with blood sugar fluctuations, hypertensive patients who have to hold their beta-blocker medications for the procedure. Appointments are only in the morning so working patients and family members who are involved in taking patients to the clinic have to adjust their schedule. Web information for the sophisticated patients who check the Internet regarding the procedure, 4) *Exosystem*: our organization, the hospital, and health insurance, Medicare, Medicaid, Oregon Health Plan, employer mandated tests, test guidelines according to the ACC, AHA, ACLS/BLS, protocol followed, 5) *Macro system*: socio-cultural beliefs – patient and family's concerns regarding other family member dying during or having a heart attack or complication as a result of the stress test. Patient's concerns regarding the ramifications of the test – are they going to have a cardiac bypass surgery, stent, or additional medications.

In the **Organizational Model** the systems identified include: 1) *Internal*: targeted outcome of change effort which are the NP and RN, 2) *Microsystems*-interpersonal relations with Nuclear Medicine personnel, cardiology personnel, managers including chief of the department of cardiology and the Nuclear Medicine, unit manager, 3) *Mesosystem*- Nuclear Medicine unit and the stress laboratory, department of cardiology, pharmacy preparing the medications, 4) *Exosystem* – organizational structure, administrative hierarchy from the chief down to the employees – straight lines and dotted lines of the hierarchy structure, billing department, HR (human resources) dealing with hiring and staff qualifications, job description, policy staff development and utilization review, 5) *Macrosystem*-organizational culture, patient safety, customer service, accuracy of the test, appropriate management and follow up of test results, cost benefit. Clinical guidelines and performance evaluation.

### **Root Cause Analysis**

Interpreting the problem of quality care and cost using the systems of global and organizational ecological environment, I was able to use “The Five Why’s” to analyze the root cause. I identified the action step in why it was done a certain way, then back-stepped, asking myself the “why” question five times. I then repeated the “why” question five times with each subsequent question I got. (Braaten, J., 2007). I then used the “fish bone” diagram to write down the answers from the above “five why’s” to see if there was a gap in the system or policy that might have contributed to the problem.

### **RESULTS**

Examining each model within the current situation and applying the “Five Why’s” and the “Fish Bone” diagram, I identified the major inputs/outputs to the system that contributed to the root cause. The results of the process are summarized:

**I.** The two Nuclear Med MDs rotate performing the pharmacological stress tests daily.

When they are not available, 2-3 radiologists do the rotation. In December 2006, Nuclear Medicine requested that this service be changed to the cardiology department.

*(Why?)* - One Nuc Med MD is retiring in the summer 2008 and the Nuc Med MDs are inundated with PET scans and other Nuc Med responsibilities. *(Why?)* – More doctors are ordering Nuc Med scans and there were delays in reading the results. The radiologists do not want to perform or supervise the pharmacologic stress tests anymore. *(Why?)* – The new radiologists are not comfortable performing the tests. *(Why?)*- It is outside their scope of practice and not comfortable handling emergencies and complications and some do not want to take the ACLS, and they are busy reading X-rays other radiology tests. *(Why?)* – the radiologists and the Nuc Med MDs are in the same department and they cover each other. Therefore, lack of dedicated provider to provide the service.

**II** – The Cardiology department agreed to take on the service.

*(Why?)*- This is the standard of care. *(Why?)*- This has always been done in the hospital – all cardiac tests are done by the cardiology department including the pharmacologic stress tests.

*(Why?)* - To provide uniformity of service. Instead of a cardiologist to cover the satellite clinic, an NP/PA was suggested to provide the service. *(Why?)* – These tests are currently being done in the hospital by the trained NPs/PAs/RNs in the hospital. *(Why?)* – This provides cost benefit for the organization compared to a cardiologist. *(Why?)* - Inefficient use of cardiologist for this service of care since there is already a shortage of cardiologists in the hospital performing angiograms and other invasive procedures. *(Why?)* - Patients need to have their angiograms, pacemakers, and other procedures to be done in a timely fashion. *(Why?)* – So patients can be

treated early to avoid early complications and unnecessary hospitalizations that can be costly. Therefore, effective use of cardiology non-physician providers is the change effort.

**III** – Areas of deficiencies were identified that need to be changed prior to cardiology taking over Nuc Med in the satellite clinic in performing the pharmacologic stress testing:

1) Lack of dedicated provider, 2) inefficient use of NP/MD resources, 3) inconsistency in the procedure and protocol between the Cardiology and Nuc Med departments, 4) patient safety issues – need for a 12 lead EKG machine with printing capabilities (Nuc Med was only using a 3 lead EKG monitor), mock codes done regularly (currently not done at Nuc Med), 5) patient privacy issues – need for a separate room to do the tests (NucMed performs the tests in the hallway between the two nuclear cameras due to space constraints).

### **CONCLUSION**

Essentially, the LEAN thinking approach (King, 2006) to an organization of complex process managed to break down the intricate details of the problems within the setting of the clinic. The cardiology department decided that it was best that they take on the responsibility for the service to provide consistency in personnel, patient safety and satisfaction to promote the privacy rule and providing standardization of care. This was a planned change effort on improvement of service delivery – i.e., consistent availability of trained cardiology personnel to perform pharmacologic stress testing in one of the satellite clinics. The actual change effort description followed the 12-step process (Maxwell, P., 2005): 1) define current organizational objectives, policies and practices. Examine existing conditions (internal and external), strengths and weaknesses of both the cardiology and Nuc Med department, overall same mission statement

2) identify and document new demands (the need and the ability to change) – NucMed’s request that cardiology take over the service due to inconsistent availability of trained professional to provide the service), 3) conduct management audit analysis (cost-benefit analysis of the current and future service, needed resources and equipment, staff expertise and appropriate trainings , 4) define need for change (consistent safety standards), 5) document an overview action plan for change (involvement of different managers on both NucMed and cardiology and site clinic manager to avoid resistance, time table on when the change will be effective, budgetary considerations, 6) conduct management review of action plan (specific schedules and activities by the executive managers of the cardiology team., 7)conduct functional management review (leadership roles identified), 8) initiate implement processes (by now there was communication with the key players of the cardiology team), 9) develop revised policies, procedures, and operations in terms of revised objectives (cardiology taking over with written standard policies on the procedure), 10)fine tune required adjustments as required, 11)implement changes (finally this is the actual changing of the service from Nuc Med to cardiology on June 2007), 12)monitor ongoing operations (follow up meetings and review process).

### **Discussion—organizational readiness to change**

Internal and external forces created a need for change: namely, changing provider responsibilities and expectations, change in management, HIPAA rules, reimbursement, revenues and increasing costs of health care. A planned response was developed and was implemented by the upper management. It was imperative that upper level management identified the factors that might cause resistance to change in staff members as outlined by Lewin’s change model – Force Field Analysis. In all change recommendations, it is important

that managers communicate the need for change to members of the affected work force to make them understand the reasons for the change and to participate in the design of the new approach in order to avoid staff resistance to change. (Maxwell, P., 2005). Indeed, individuals given a choice reported a high level of motivation including social support (training on the job). (Narayan, A., 2007).

### **Results and recommendations**

Ultimately, success is measured by the outcome of the change effort. Did the outcome of the change effort meet its intended goals? Were goals clearly identified? Our organizational goals have been to improve access, patient satisfaction, quality of care and cost. One of the strategies is the Ambulatory Care Redesign. We as the organization are meeting some of our goals in terms of reducing our cost trend and improving quality of care (via our HEDIS measure). We are still lagging in specialty care access and patient satisfaction. According to our operations manager during the interview of the stakeholders, “We continue to struggle, so we develop new strategies (i.e., ways to change), identify new targets and keep moving forward. Effective utilization of non-physician providers performing pharmacologic stress testing as a redesign strategy/change effort could have come out of the LEAN approach.” (King, 2006). The shift in responsibility sounded simple at first but it took a lot of planning and involved a larger system issue than was anticipated. The change effort was successful because of adequate planning, proper communication, and involvement of the key players and staff readiness for change keeping in line with the organization’s mission. Sustainability of the effort is still in place because this model is currently being practiced in the hospital setting within the same organization. I believe that the only constant in our company is change Change is for the

improvement of existing practice to keep up with the demands of the society as a whole. I will say that our company's capacity for change is better than most organizations.

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Running Head: ENVIRONMENTAL HEALTH RISK CASE STUDY

Indoor Environment and Asthma

An Environmental Health Risk Case Study

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A number of factors can complicate the diagnosis of asthma in elderly patients. Congestive heart failure, chronic obstructive pulmonary disease (COPD) and asthma are syndromes where dyspnea, cough and wheezing are overlapping signs and hence the syndromes are difficult to differentiate (McCullough, 2003). A number of risk factors for the development and severity of asthma in childhood are known, but information on elderly patients is lacking (Parameswaran, Hildreth, Taylor, Kearney, & Bansal, 1999).

This case study will analyze the multiple factors in the indoor environment that affect the health outcomes of adult patients with asthma. The purpose of this case analysis is to review the current recommendations in improving indoor environment in patients with asthma. Improvement in lung function of adults will lead to increase quality of life of adults especially the elderly suffering from other co-morbidities.

### *Case Analysis*

Victor is a 65 year-old Caucasian male, who has a known history of coronary artery disease. He suffered a myocardial infarction two years ago. He has been hospitalized twice for exacerbation of congestive heart failure (CHF). He presented to the clinic with some intermittent shortness of breath, chest tightness, non-productive cough but no fever, chills, night sweats, or weight loss. His physical examination was normal except for a slight wheeze in his chest. He denies any history of asthma or chronic obstructive pulmonary disease (COPD). He reports to have had allergic rhinitis when he was 10 years old. He does not recall any problems with allergy problems since

age 18. He quit smoking at age 30. He works 40 hours a week in a paper mill. He has lived in his 1920 home for 20 years, which is a two-level house with a basement. He lives with his wife, and two cats.

His chest X-ray, EKG, CBC, serum electrolytes troponin and plasma B-type natriuretic peptide (BNP) came back normal. His oxygen saturation was 98%. His presumptive diagnosis was asthma and he was given a trial of ProAir and Flovent inhalers. He was then referred for spirometry.

He returned for a clinic follow up two weeks later and his symptoms had somewhat improved. His question to the nurse practitioner was, “How long do I have to use these inhalers?”

### *Epidemiology*

More than 30 million people in the United States have been given diagnoses of asthma, and at least two thirds of the patients with diagnosed asthma have current active symptoms (Salo et al., 2008). A number of epidemiologic studies carried out over the past 25 years have shown that IgE-mediated sensitization to indoor allergens (including those that derived from house dust mites, cats, dogs and rodents, cockroaches and fungi) is a risk factor for the repeated or prolonged exposure. Polymorphisms of a number of gene coding for critical regulatory proteins are responsible for the genetic susceptibility to sensitization to environmental allergens seen in asthmatic patients (Eggleston, 2007). Allergens might be considered harmless environmental antigens. Such antigens are recognized by the immune system and the normal immune response is the development of clinical tolerance. In patients with allergies and asthma, such antigens are recognized as “dangerous,” and the immune system mounts an inflammatory response characterized

by proliferation and activation of TH2 cells (Zeldin et al., 2005).

Salo et al., (2008) also posited that indoor exposures are of great importance in relation to asthma because most people spend large amounts of time indoors especially at home. White households were more likely to have increased levels of cat, dog, and dust mite allergens than nonwhite households, whereas the presence of cockroach and mouse allergens in increased levels was significantly more prevalent in nonwhite households (Wright & Subramanian, 2007). Households with lower income (< \$40,000) were more likely to have high allergen burden than households with higher income (Salo).

Asthma has long been recognized as a complex, genetic disease mediated by exposures to a variety of environmental triggers (Miller & Shuk-Mei, 2008). Environmental exposures to allergens and air pollutants such as particulate matter, environmental tobacco smoke, and nitrogen oxide (generated in homes by gas stoves and space heaters) affect a susceptible host (Eggleston, 2007). Some occupational exposures such as cleaners, solvents or paper dust (Tarlo, 2003) result in airway inflammation and obstruction that leads to respiratory morbidity (Tarlo, 2006). Underlying and influencing each step of this process are societal susceptibility factors that are specific to inner city that serve to increase asthma morbidity (Salo, 2008). These factors include psychosocial stress, high smoking rates, inappropriate medication use, inadequate resources and poor access to quality health care.

A number of allergen sources have been identified in the indoor environment. House dust mites thrive in humid environments and live on human skin scales (Zeldin et al., 2005). Fecal particles, which contain the allergens do not remain airborne, therefore

the exposure is limited primarily to bedding, carpeting, and upholstered furniture. Cockroaches cluster in narrow hiding places, coming out only to forage for food and water. The particles that contain the allergen is widespread in settled dust which accumulates in places inaccessible to cleaning. Exposure levels in the range of 2 mcg per gram of house dust is adequate to trigger health symptoms (Barnes et al., 2007). Rodents hide within walls and crevices and leave high concentrations of allergen in inaccessible areas. Pets with fur produce allergens in their saliva and sebaceous secretions (Zeldin, 2005). Fungal species and mold spores infiltrate the indoors via doors, windows, cracks and crevices.

### *Discussion*

Victor has exposures to multiple indoor allergens with increased levels of endotoxins in his home and work. He is exposed to paper dust at work. He lives in an older house which increases the prevalence of certain household allergens. Certain housing types if not properly maintained affect temperature and humidity levels. In this type of housing, presence of mouse, cockroach, rodents and certain pets predispose asthma exacerbation as in Victor's case. Asthma exacerbation is difficult to diagnose in a patient with co-morbidities especially in the presence of CHF. Thus, careful and extensive history taking is important in patients like Victor with cough and dyspnea presentations.

Asthma morbidity is a significant public concern, not only in terms of health care costs but also in terms of lost productivity and reduced quality of life (Salo et al., 2008). Residential allergen burden that are present in increased levels are strongly

affected by socio-demographic factors (Salo). Environmental factors play an important role for the development and manifestation of allergic conditions in genetically predisposed subjects (Nolte, Backer & Porsbjerg, 2001). Multiple factors of the indoor home environment were associated with lung function, disease severity, health status and quality of life in adults with asthma and rhinitis (Blanc et al., 2005). Several studies indicate that prevalence of asthma and allergy is lower in rural areas than urban areas and changing environment may influence the development of allergic diseases (Nolte et al., 2001).

In the 2005 National workshop to eliminate asthma disparities, Weiss (2007) reports that recent evidence suggests that the role of the family and other social structures may affect asthma outcomes and new studies are beginning to explore this relationship for various racial/ethnic groups. State sponsored programs play essential roles in addressing asthma morbidity and include Medicaid programs, education, public health programs and surveillance. A number of clinical trials have examined the “best practices” in asthma care, The challenge is to understand how findings from well-controlled and highly selective randomized controlled environments may generalize to real-world clinical practices and health-care organizations (Weiss).

### *Recommendations*

Tarlo (2008) lists the evidence-based clinical practice guidelines in reviewing the role of occupational and environmental factors in causing and contributing to cough. She mentions that occupational and outdoor environmental air pollution. These guidelines may be applied to patients with dyspnea and indoor environmental exposures as well:

1. Taking a medical history, ask for environmental and occupational causes.
2. In every patient who has potentially significant exposures to suspicious environmental or occupational causes, determine the relationship of these factors to confirm or refute their role in cough/dyspnea and to modify or eliminate exposure to relevant agents.
3. Health care providers should play a role in developing and supporting enforceable standards for safe workplace and indoor pollution exposure limits.
4. In patients with a high suspicion of cough/dyspnea due to environmental or occupational exposures to consider referring the patient to a specialist in this area or consult evidence-based guidelines.

Many allergy practitioners believe strongly that the removal of the allergenic substances can result in improved health outcomes for their patients (Barnes et al., 2007). After removal of a pet, household settled dust allergen levels decline over a period of 4-8 months. Air cleaners have been reported to reduce airborne pet allergen levels, but they have minimal effect on settled-dust allergen levels (Zeldin, 2005). Asthmatic individuals are more sensitive to endotoxin than non-allergenic individuals suggesting a role for genetics in the innate immunity response, and the potential for gene-environment interactions (Barnes).

Action plan for Victor includes discussion on reducing and controlling indoor allergens by removal or reconstruction for mold, removal of pets from the home or bedroom, extermination for reduction of pests, dehumidification and drainage

improvement for moisture control, use of physical barriers such as impermeable sheets for mites and filling holes in the wall for rodents and roaches, vacuuming to remove dust, high efficiency air filtration to clean the air of particulate matter, professional cleaning and cleaning education into methods and products to reduce indoor allergen exposure (Barnes et al., 2007)

Understanding of the environmental influences is the beginning, especially the knowledge of indoor exposures in asthma triggers and morbidity. Environmental exposure assessment is helpful and referral to allergy department is recommended. New genetic methods help us to dissect the genetic basis of the increased susceptibility in asthma, caused by IgE-mediated mechanisms. Once identified, individual genes can be confirmed and susceptible alleles are sought so that preventive strategies can be focused on susceptible individuals (Eggleston, 2007).

There is an immense promise that the study of environmental epigenetics will help us understand a theoretically preventable environmental disease (Miller & Shuk-Mei, 2008). As DNPs, awareness of the findings of a strong association between indoor allergen exposure and asthma in those at lower socioeconomic status, has important public health implications. It can be shown that disease can be improved by changing environmental exposures, this would support programs to improve housing conditions in the inner cities. High-efficiency particulate air filtration and home-based education reduce daily symptoms and prevent emergency department use and hospitalizations.

Allergen exposure reduction is a fundamental part of asthma management. Therefore, it is important that the nurse practitioner gain a better understanding of asthma, its implications for the adults and elderly, prevention, and awareness of new research in the

field of asthma to provide quality patient care with appropriate diagnosis, treatment and prevention of this disease.

*Self-reflection on personal and professional skills*

The nurse practitioner lists the differential diagnoses in Victor's case as:

1. Congestive heart failure exacerbation which was ruled out by the chest Xray and BNP and physical examination
2. Acute Coronary Syndrome was also ruled out with negative EKG and cardiac markers
3. Pulmonary embolism was ruled out with negative D-dimer
4. Asthma exacerbation (although it had been 40 years since his last asthma symptoms).

It is easy for the nurse practitioner to just concentrate on her subspecialty in cardiology. However, careful history taking in unraveling the contextual factors in any disease is crucial, followed by patient education/instructions and appropriate referral.

Looking at the bigger picture for DNPs include the development of leadership skills in indoor environmental prevention research starting at the clinical level. Another leadership potential for DNPs is looking at relationship of indoor environmental exposure to prevalence and morbidity of asthma in developing public health programs to reduce asthma burden.

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Running Head: DEPRESSION AND ANXIETY IN CORONARY HEART DISEASE

## Depression and Anxiety in Coronary Heart Disease

### A Case Study

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Known modifiable cardiac risk factors include serum cholesterol, obesity, hypertension, serum glucose and psychological stress. Multiple studies link depression and anxiety with coronary heart disease (CHD). Depression is approximately three times more common in patients after an acute myocardial infarction (MI) than in the general community (Lichtman et al., 2008). Depression is associated with worse prognosis in patients with CHD, however the majority of cases are not recognized or appropriately treated. This case study analyzes the importance of depression and anxiety in CHD and reviews guidelines in identifying and treating this condition in order to impact the patients' post hospital care especially postoperative care.

### *Case Presentation*

EB is a 58 year old woman with a history of type 2 DM for 12 years, complicated by retinopathy, neuropathy and nephropathy; hyperlipidemia; hypertension; and a recent mitral valve replacement surgery for MRSA endocarditis and coronary artery bypass graft (CABG) surgery utilizing left internal mammary to left anterior descending artery one month ago. She also has a history of anemia of chronic disease and peripheral vascular disease with multiple toe amputations on the right foot. She quit smoking 2 years ago, with a history of 1-2 pack cigarette use per day for 10 years. She was admitted to the hospital 2 weeks ago for lower extremity edema and shortness of breath. She denied having chest pains or fevers. She was discharged three days later with a diagnosis of congestive heart failure after successful diuresing with intravenous Lasix.

She was seen in follow up at the cardiology clinic 2 weeks later by a nurse practitioner (NP). She was feeling better with her shortness of breath and her leg edema had subsided. She denied orthopnea, paroxysmal nocturnal dyspnea, dyspnea on exertion although with limited activity to watching television mostly. On review of systems, the NP noted that she had poor

appetite, depressed mood, poor sleep, no energy and poor concentration the past 6 weeks. She denied any suicidal thoughts.

Her medications include Lantus 70 units SQ every night, regular insulin sliding scale with meals, Warfarin, Bumex 2 mg twice daily, K-tab 10 meq one tablet twice daily, Procrit 20,000 units SQ three times weekly, Gabapentin 200 mg one tablet three times a day, Pepcid 20 mg once a day, FeSO<sub>4</sub> 325 mg one tablet daily, Vitamin C 500 mg once daily, Simvastatin 80 mg once at bedtime, Norvasc 7.5 mg 1 tablet daily, Vicodin as needed for pain, Ambien 5 mg at bedtime as needed for insomnia.

The patient has allergies to Lisinopril and Aspirin. Her blood pressure was 134/80, with BMI was 30 kg/m<sup>2</sup>. She denied alcohol use or illicit drug use.

### *Background*

Depression has long been recognized as a risk factor for the development of CHD in healthy patients, for recurrent events in patients with established CHD, and for adverse outcomes after coronary artery, bypass graft (CABG) surgery (Whooley, et al. 2008; Zangwill, 2007). The prevalence of major depression in medical outpatients is estimated at 5% to 13%, but the prevalence of major depression after a myocardial infarction (MI) is estimated at 20% while over 33% have significant symptoms of depression soon after an MI ( Tofler, 2008), up to 50% or patients recently hospitalized after CABG or acute coronary syndrome (Whooley, 2006). Post MI depressed patients have poorer outcome with a 2 to 2.5 fold increased risk of mortality compared with non-depressed patients.

The proposed mechanism linking depression and CHD are: common genetic vulnerability, increased platelet activation, elevated catecholamine levels, autonomic cardiac tone changes and increased serotonin (Zangwill, 2007; Yeung, et al., 1991). Depression is

associated with poor compliance with treatment/medication recommendations (Tofler, 2008).

Twenty five to fifty percent of patients who undergo CABG have symptoms of depression before surgery and have greater emotional stress and less social support than other patients before surgery (Charlson & Isom, 2003). Approximately half of those patients who are depressed before surgery have a resolution of depressive 6 months after CABG. About 18 percent of patients who are not depressed before CABG have an increase of depressive symptoms after surgery (Charlson & Isom).

Many epidemiologic studies have suggested that patients with chronic anxiety may be at risk of developing CHD and can lead to worsening of existing CHD. Worry particularly about social conditions, increase the risk for nonfatal MI (Tofler, 2008). Anxiety is linked to social stressors associated with poverty, job strain, or being a minority all lead to an increased risk of CHD. Phobic anxiety may increase the risk of sudden cardiac death because of decreased heart rate variability. A strong social support system can be protective against CHD (Janeway, 2009).

### *Diagnosis and treatment of depression and anxiety in patients with CHD*

The American Heart Association and the American Psychiatric Association (Lichtman, et al. 2008) recommend the use of the Patient Health Questionnaire (PHQ-2) that provides two questions that are recommended for identifying currently depressed patients (Table 1). The PHQ-9 is a brief depression screening tool that patients are able to complete in about five minutes or less has been shown to have a reasonable sensitivity and specificity for patients with CHD (Table 2.)

Treatment of depression alleviates symptoms of depression and improves quality of life especially in patients post CABG (Whooley, 2006). Treatment of depression and anxiety may

include cognitive behavior therapy, and use of selective serotonin reuptake inhibitors (Berkman, et al., 2003). Whooley (2006) outlines the treatment recommendation of depression and anxiety. Initial treatment for depression and anxiety is structured psychotherapy or medication therapy or both. The goal of structured psychotherapy is to help patients develop new ways of thinking and behavior that minimize depression and anxiety symptoms. For medication, selective serotonin reuptake inhibitors are safe and effective for cardiac patients. Citalopram and sertraline are the least likely to inhibit cytochrome p450 enzymes which decreases the drug-drug interaction in cardiac patients taking multiple medications. Lichtman et al. (2008) report that tricyclic antidepressants and monoamine oxidase inhibitors are contraindicated for many cardiac patients because of cardiotoxic side effects. St John's wort is not recommended due to potential interactions with certain cardiac medications.

Aerobic exercise and cardiac rehabilitation can reduce depressive symptoms at the same time can improve cardiovascular fitness. There is a need for an individualized exercise prescription based on the cardiac status and patient's exercise capacity (Lichtman, et al. 2008).

#### *Suggestions for interventions/change strategies*

According to Charlson & Isom (2003), patients who are depressed after CABG tend to have more cognitive and functional impairment compared with other surgical patients. They may not have obvious affective disorder, therefore patients who perceive themselves as having cognitive deterioration such as impaired memory need to be evaluated for depression and be appropriately treated.

Certain behaviors and social characteristics of patients with depression and anxiety may contribute to the development and progression of CHD. These include non-adherence to heart healthy diet, smoking, medication non-adherence, and lack of physical exercise, social isolation

and chronic life stress (Lichtman, et al. 2008). Beyond what many believe to be its patho- physiologic effect on the heart, depression and anxiety are associated with decreased adherence to medications and triple the risk of noncompliance with medical treatment regimens. Preventive medications decrease mortality and morbidity in patients with CHD and medication non-adherence is common in patients with depression (Whooley, 2006). Whooley (2006) further suggests that medication non-adherence is a marker for unhealthy behaviors that increase the risk of cardiac events in patients with depression therefore it is imperative that appropriate treatment of depression be instituted sooner than later.

The most difficult period in the recovery process post CABG is the first month following discharge from the hospital. (Shumaker & Czajkowski, 1994). Emotional stress, particularly depression tends to peak after hospital discharge rather than during hospitalization. Family tensions increase during the immediate post hospitalization phase. Depression reduces the chances of successful modification of other cardiac risk factors and participation in cardiac rehabilitation and is associated with higher healthcare utilization and costs and greatly reduced quality of life, therefore this is another reason to evaluate and treat depression (Lichtman et al.) and to refer patient to cardiac rehabilitation.

EB was diagnosed with depression and she was willing to try Prozac 20 mg 1 tablet a day and was given a follow up appointment 2 weeks later with the nurse practitioner and was reminded to notify the advice nurse for problems or concerns. The nurse practitioner had a difficult time persuading EB to attend the cardiac rehabilitation program but in the end, she agreed to try it. Now having her adhere to cardiac rehabilitation is another challenge for the nurse practitioner in order to help support EB.

*Implications for nursing and potential impact for advanced practice and health policy*

Awareness of evidence-based guidelines in modifiable cardiac risk factors is important, however, individualizing treatment and assessment of other risk factors, in this case depression in addition, anxiety, are imperative in the care of this particular patient.

As an advanced practice nurse, participation in research and in establishing treatment guidelines/recommendations in secondary CHD prevention incorporating cardiac rehabilitation, screening/assessment for psychosocial factors and appropriate treatment of patients with existing depression and anxiety, utilizing patient social support system and multidisciplinary strategies including referral to mental health, collaboration with psychiatrists and other mental health providers in addition to the primary care physician are highly suggested.

*Self-reflection on personal and professional leadership skills*

Based on this case study, this NP gained a better understanding of the role of psychotherapy. Based on the literature review, this NP now have a deeper understanding of the importance of recognizing and treating depression and anxiety in cardiac patients to gain improved health outcomes. Sometimes working in subspecialty, we forget to take care of the patients in a holistic manner. Overcoming depression and anxiety can lead to better medication and treatment adherence of the cardiac preventive medications and important lifestyle changes that lead to secondary prevention of CHD.

Professionally, collaboration with the primary care provider and the mental health specialists in the overall health of the patient will provide support to patients with depression and anxiety. The first month after hospitalization is the most difficult period and it is very important for the cardiology clinician to rule out depression and anxiety to prevent protracted recovery,

which leads to increased morbidity and mortality. Close follow up of these patients may be necessary.

Simply asking or routinely asking the patients regarding their mood and having them fill out a depression or anxiety questionnaire for screening patients is a start. Sometimes cardiology clinicians do not want to discuss these issues thinking that it is a sole primary care provider's responsibility. Yet, if we want cardiac patients to adhere to cardiac regimen, we in subspecialty services need to be proactive in identifying barriers to medication or treatment adherence such as depression and anxiety.

Patients who had CABG have the misconception that they are cured or fixed of their heart disease. It is very important for the clinicians to educate the patients that their symptoms are controlled for now, however, CHD is a chronic disease and it will last a lifetime. Therefore, it is crucial to modify their risk factors to prevent further cardiac events, such as controlling the cholesterol levels, blood glucose, blood pressure, weight, and stress. In this particular case, recognizing depression and anxiety and adequate treatment are additional entities that need to be addressed.

Patients who underwent surgery as in the case of EB or hospitalized due to an acute coronary event, EB could have a higher tendency to develop depression and anxiety which might lead to postoperative challenges and compliance to therapy. Clinicians need to be vigilant in close monitoring of these types of patients to prevent poor health outcomes. There is a need for better screening within the practice of cardiology for psychological risk factors to ensure better integration of mental health services in collaboration with the primary care physician.

A potential DNP role is to improve processes of care by advocating cardiac rehabilitation for all patients not only for patients who are post CABG, post acute coronary syndromes but also especially for patients with special needs particularly those with pre-existing depression and/or

anxiety. Recovery from an MI or cardiac surgery is often accompanied by physical and psychological problems. The most difficult period in the recovery period post MI or cardiac surgery is the first month following hospital discharge. Depression and social isolation tend to peak after hospital discharge. Enrollment in a cardiac rehabilitation program can provide them with information, guidance and support along with cardiac risk factor modification.

Finally, including the family especially the spouse or significant other in the patient's care is very important especially the first month after hospital discharge. Appropriate social support from the clinicians provides the patient with an increased sense of worth and importance which facilitates therapy compliance and positive health outcomes.

Another potential DNP role is to set up a support group for patients who have diagnosed depression and anxiety especially within the first month of hospital discharge.

In conclusion, depression and anxiety are common conditions in postoperative CABG and patients' symptoms may or may not present as affective but as cognitive impairment. Depression may cause medication and treatment non-adherence. Newly diagnosed depression after CABG are at higher risk than non-depressed patients and have an increased risk of cardiovascular events, therefore early recognition and treatment of these patients and need to be followed closely especially for those who do not have adequate support. Cardiac rehabilitation referral and follow up is needed. Also, efforts at multidisciplinary approach can be looked at and this could be a potential role for the DNP to work on as a clinical inquiry thereby improving patient health outcomes.

Table 1. Patient Health Questionnaire: 2 items\*

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Over the past 2 weeks, how often have you been bothered by any of the following problems?

- (1) Little interest or pleasure in doing things.
- (2) Feeling down, depressed, or hopeless.

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\*If the answer is “yes” to either question, then refer for more comprehensive clinical evaluation by a professional qualified in the diagnosis and management of depression or screen with PHQ-9

Table 2. Patient Health Questionnaire – 9 (PHQ-9)\* Depression Screening Scales

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Over the past 2 weeks, how often have you been bothered by any of the following problems?

- (1) Little interest or pleasure in doing things.
- (2) Feeling down, depressed, or hopeless.
- (3) Trouble falling asleep, staying asleep, or sleeping too much.
- (4) Feeling tired or having little energy.
- (5) Poor appetite or overeating.
- (6) Feeling bad about yourself, feeling that you are a failure, or feeling that you have let yourself or your family down.
- (7) Trouble concentrating on things such as reading the newspaper or watching television.
- (8) Moving or speaking so slowly that other people could have noticed. Or being fidgety or restless that you have been moving around a lot more than usual.
- (9) Thinking that you would be better off dead or that you want to hurt yourself in some way.

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\*Questions are scored: not at all = 0; several days = 1; more than half the days = 2; and nearly everyday = 3. Add together the item scores to get a total score for depression severity.

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Running Head: DIABETES AND CORONARY HEART DISEASE

Diabetes and Coronary Heart Disease

A Case Study

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Patients with type 2 diabetes mellitus (DM) have twice the risk of incident myocardial infarction (MI) as that of the general population (Buse et al., 2007). Patients with type 2 diabetes who have not had a myocardial infarction have a risk of infarction similar to that among non-diabetic patients who have had a prior myocardial infarction (Haffner, Lehto, Ronnema, Pyorala, & Laasko, 1998). Large numbers of people with DM do not survive their first cardiac event and if they did survive, their mortality rate over the subsequent months to years is generally greater than that of the general population (Buse et al.). Study data provide a rationale for treating cardiovascular risk factors in diabetic patients as aggressively as in non-diabetic patients with prior MI (Haffner, et al., 1998).

Recent guidelines for coronary heart disease (CHD) management in diabetes are based on the premise that most patients with diabetes are at high risk for future cardiovascular events. When diabetes exists in patients with established CHD, absolute risk for future events is very high (Buse et al., 2007).

This case study analyzes how a young woman with DM continues to struggle in dealing with CHD hospitalization, multiple procedures and treatment associated with her medical conditions. This case study discusses how aggressively clinicians have to be to treat type 2 DM to prevent the development of further cardiac events in patients who already have established CHD. This case study will review the current evidence-based recommendations for CHD in patients with DM.

### *Case Presentation*

AD is a 48-year-old Hispanic female was seen by the nurse practitioner in the cardiology clinic for a one-week hospital discharge follow up status post non-ST elevation myocardial infarction (NSTEMI). Over the past year, she has had “pinches in her heart” for which she takes nitroglycerine sublingual tablets on average 2-3 times a month. For the past three weeks prior to the emergency room presentation, she has been having some shortness of breath with physical activities and one week prior

to hospital admission she has had generalized weakness with little exertion. She was noted to have elevated troponins and received medical treatment for the recent MI. She underwent cardiac catheterization during this admission which showed a normal left ventricular systolic function, and small diabetic vessels with her acute symptoms due to occluded obtuse marginal vessel (OM 1), not amenable to another revascularization procedure. It was noted during the interview session that she had been somewhat noncompliant with her out patient medications. Either she forgets to take the prescribed medications or too busy doing other things. Her medications include ASA 81 mg daily, Isosorbide mononitrate 60 mg. daily, Lovastatin 80 mg. (intolerant to Simvastatin) daily, Lisinopril 10 mg. daily, Atenolol 50 mg. twice daily, Lantus and Novolog insulin, NTG sl prn.

Her past medical history is significant for coronary artery disease, status post cypher stent to a 90% obstruction of her distal circumflex in May 2006. She apparently neglected to take her Plavix and presented to the hospital for angina. Prior to this, she underwent coronary artery bypass graft (CABG) surgery x 3 vessels (left internal mammary artery to left anterior descending artery, left radial artery to left posterolateral artery, and saphenous vein graft to obtuse marginal) in August 2008. She also has poorly controlled type 2 DM during this recent hospital admission with a HgbA1C of 10.8% and was started on insulin. She was diagnosed with type 2 DM five years ago. She has hypertension, hyperlipidemia with an LDL cholesterol of 81, HDL of 35, triglycerides of 268. She also has obesity with a body mass index (BMI) of 40. She has a history of smoking.

During the first post hospital clinic visit, she had been feeling better and her activities included making her bed, limited walking due to some shortness of breath, and otherwise denies orthopnea, PND, chest pain or syncope/presyncope. Her eldest daughter was with her during the visit. She called her daughter "her coach" helping her manage her hospital discharge care.

Her physical examination was unremarkable except for a blood pressure of 150/80, which was still not controlled. Her Atenolol was increased and was started on Omega 3 fatty acids. Fasting blood

glucose, lipids, ALT, HbA1C tests were ordered to be done in approximately two months. She was referred to cardiac rehabilitation. She had a good social support at home and at that time was employed in a school district taking care of children with disabilities.

Her second hospital visit was one month later. Her BP was now 118/68, her home blood glucose readings were at goal in the low 100s, had lost approximately 10 lbs., and denied hypoglycemic episodes. She was enjoying cardiac rehabilitation and was doing treadmill and stationary bike gradually increasing in speed and distance. She brought a journal with her of her daily food intake, her blood sugar levels and blood pressure levels during cardiac rehabilitation. She completed all the cardiac classes including heart healthy nutrition, medication classes, anatomy class and cardiac support group. She showed compliance with her medications and has not missed any of the cardiac rehabilitation classes. She reported that she was now in charge of her health and she was looking forward to getting better so she could take care of her grandchildren. She was anxious to go back to work.

### *Background and Significance*

Type 2 diabetes mellitus is a metabolic disease that is diagnosed based on sustained hyperglycemia. Type 2 DM is the result of interplay between insulin resistance and insulin secretory defects (Fonseca, 2007). Insulin secretion is increased in overweight individuals; however, insulin resistance alone is insufficient to cause type 2 DM. The beta cells of individuals with type 2 DM cannot secrete enough insulin to meet the needs of insulin-resistant tissues. By the time of diagnosis, many patients with DM have lost 50% of beta-cell function (Fonseca). The chronic complications of diabetes occur because of impairment of the microvascular and macrovascular circulation. Microvascular complications include diabetic nephropathy, retinopathy and peripheral neuropathy, which result from damage to the minute blood vessels of the kidneys, retina and nerves. Macrovascular impairment results in cardiac, cerebral and peripheral vascular disease due to damage of the large vessels of the

brain, heart and legs (Lawal, 2008). Diabetes is defined by its association with hyperglycemia-specific microvascular complications, however, is also imparts a two to four-fold risk of coronary vascular disease. Although microvascular complications can lead to significant morbidity and premature mortality, by far the greatest cause of death in people with DM is CHD (Skyler et al., 2009). Results from randomized controlled trials have demonstrated conclusively that the risk of microvascular complications can be reduced by intensive glycemic control in patients with DM. The incidence of these outcomes is directly associated with the degree of hyperglycemia, as measured by the plasma glucose or glycated hemoglobin level (HgbA1C), a measure of the mean blood glucose level during the previous two to three months (Gerstein, Miller, Byington, & Goff, 2008). The graded relationship between the HgbA1C level and cardiovascular events and death suggested that a therapeutic strategy to lower the HgbA1C levels might reduce these outcomes (Gerstein, et al., 2008). In the Diabetes Control and Complications Trial (DCCT), there was a 60% reduction in the development or progression of diabetic retinopathy, nephropathy, and neuropathy between the intensively treated group (goal HgbA1C less than 6%) over an average of 6.5 years. In the UK Prospective Diabetes Study (UKPDS) participants newly diagnosed with type 2 DM were followed up for 10 years, and intensive control (HgbA1C less than 7.0) was found to reduce the overall microvascular complication rate by 25% compared with conventional treatment. Epidemiological studies suggest that each 1 percent increase in HgbA1C is associated with an 18% increase in the relative risk of CHD with type 2 DM (Buse et al., 2007).

Because of ongoing uncertainty regarding whether intensive glycemic control can reduce the increased risk of CHD in people with type 2 DM, several large long-term trials were launched in the past decade to compare the effects of intensive and standard glycemic control on CHD outcomes in relatively high-risk participants with established type 2 DM. In 2008, two of these trials, Action in Diabetes and Vascular Disease-Preterax and Diamicron Modified Release Controlled Evaluation (ADVANCE) and the Veterans Affairs Diabetes Trial (VADT) were completed and showed no significant reduction in

cardiovascular outcomes with intensive glycemic control. A third trial, (Havas, 2009), Action to Control Cardiovascular Risk in Diabetes (ACCORD), terminated its glycemic control study early because of the finding of increased mortality in participants randomized to a strategy of very intensive glycemic control with a target of A1C of <6% (Skyler et al., 2009).

The relative increase in the rate of CHD among patients with DM is greater for women than for men (Haffner, 2000). In the Framingham Heart Study, the absolute incidence of CHD is similar among both men and women with DM, leading to the frequently made assertion that DM may eliminate women's protection against CHD. The increase in the incidence of coronary events is greater for more severe clinical outcomes, such as MI and sudden death than for less serious outcomes such as angina pectoris. The case fatality rate after an MI among patients with DM is higher than that for patients without diabetes. Even after a first cardiac event, 50% of patients with diabetes may die within one year, and half of those who die do so before they reach the hospital. Type 2 DM may confer the same degree of risk as preexisting CHD. Although there has been a marked decline in the rate of death due to CHD in the overall population over the past 35 years, this has not been the case among persons with diabetes (Haffner).

#### *Suggestions for interventions/change strategies*

The American Diabetic Association (ADA)'s Standards of Medical Care in Diabetes and the American Heart Association (AHA) and ADA's scientific statement on prevention advocate controlling non glycemic risk factors (through blood pressure control, lipid lowering with statin therapy, aspirin therapy and lifestyle modifications) as the primary strategies for reducing the burden of CHD in people with diabetes (Skyler et al., 2009). Patients with shorter duration of type 2 DM and without established atherosclerosis might reap cardiovascular benefit from intensive glycemic control. Potential risks of intensive glycemic control may outweigh its benefits in patients such as those with a very long duration

of diabetes, known history of severe hypoglycemia, advanced atherosclerosis, and advanced age/frailty (Skyler et al.). Clinicians need to be vigilant in preventing severe hypoglycemia in patients with advanced disease and not aggressively attempt to achieve near-normal HgbA1c levels in patients in whom such a target cannot be achieved reasonably, easily and safely.

In microvascular disease, lowering HgbA1C to below or approximately 7.0 has been shown to reduce microvascular and neuropathic complications of type 2 DM. Macrovascular disease in type 2 DM randomized controlled trials (RCTs) of intensive versus standard glycemic control have not shown a significant reduction in cardiovascular outcomes, however, long-term follow up of the DCT and UKPDS cohorts suggests that treatment to HgbA1C targets below or near 7.0 in the years soon after the diagnosis of diabetes is associated with long-term reduction in risk of macrovascular disease (Skyler et al., 2009). Less stringent HgbA1C goals than the general goal of Less than 7.0 may be appropriate for patients with a history of severe hypoglycemia, limited life expectancy, advanced microvascular or macrovascular complications, or extensive co-morbid conditions of those with long-standing diabetes in whom the general goal is difficult to attain despite diabetes self management education, appropriate glucose monitoring, and effective doses of multiple glucose-lowering agents, including insulin.

For primary and secondary CVD risk reduction in patients with diabetes, providers must continue to follow the evidence-based recommendation for blood pressure treatment including lipid lowering with statins, aspirin prophylaxis, smoking cessation, and healthy lifestyle behaviors delineated in the AHA Standards of Medical Care in Diabetes and the AHA/ADA guidelines for primary CVD prevention (Skyler et al.).

#### *Implications for nursing and potential impact for advanced practice and health policy*

The results of the previous studies show the efficacy of lipid-lowering therapy in diabetic patients with CHD and the high mortality (including pre hospital mortality) after MI suggests that all

persons with diabetes could be treated as if they had prior coronary heart disease (Haffner et al., 1998).

The American Diabetes Association recommends ACEI therapy for diabetic patients older than 55 years who are at high risk for cardiovascular disease. Beta-blockers and calcium channel blockers may be useful to persons with diabetes, particularly as part of combination therapy. However, beta-blockers are associated with worsening glycemic control and dyslipidemia and may mask hypoglycemia. The use of a third generation beta-blocker may circumvent these problems and could be a favorable choice for patients with diabetes in combination with an ACEI or ARB (Deedwania, 2007).

There are three areas identified in this case study, which have the potential impact for advanced practice and health policy; (1) understanding of the evidence-based practice guidelines for CHD and diabetes as a clinician; (2) the role of cardiac rehabilitation in secondary prevention of CHD; (3) understanding of the CHD prevention in women.

The main concepts of the guidelines for CHD prevention in women were: (1) to provide a strategic plan for providers to treat women with CHD based on the spectrum of cardiovascular risk; (2) to empower women to take charge of their cardiovascular health by increasing awareness and providing educational tools with the emphasis on the fact that favorable lifestyle changes can decrease the CHD risk factors and prevent CHD; (3) behavioral changes by women and the reshaping of clinical practice patterns by health professionals can decrease dramatically the number of women disabled and killed.

The guidelines link the aggressiveness of treatment based on the risk of developing CHD. Women are at high risk are those with a calculated risk of >20% based on the Framingham study and/or established CHD, diabetes, vascular disease or chronic kidney disease (Mieres, 2006). Women with a recent acute coronary syndrome or coronary intervention, new onset or chronic angina should participate in a comprehensive risk reduction regimen, such as cardiac rehabilitation (Mieres).

*Self-reflection on personal and professional leadership skills*

This case analysis of a young woman with uncontrolled diabetes with history of noncompliance per self report of sometimes forgetting to take her medications might have led to the unfortunate recurrence of coronary events and multiple coronary procedures. As a clinician, it is of utmost importance to motivate and assist AD in intensive risk factor modification to prevent further cardiac events by instilling confidence in her. She needs to understand that she requires regular monitoring and ongoing treatment to maintain normal to near normal blood glucose levels. Treatment includes lifestyle adjustment, self-care measures and medications to minimize the risk of diabetes and cardiovascular complications. In this situation, cardiac rehabilitation is a good example of empowering her to take charge of her cardiovascular health by providing her with educational tools for healthy lifestyle change and treatment compliance. Frequent clinic or phone follow up is another option as an individual clinician to monitor her progress.

Some of the cardiology clinicians pass on the responsibility of diabetic control to primary care physicians. An example of a DNP professional leadership role is to engage a joint or collaborative care among cardiology clinicians and primary care providers for DM control. Recent recommendation for the treatment of dyslipidemia and high blood pressure in patients with diabetes suggest that such patients should be treated as aggressively as those with preexisting CHD – a recommendation that is reasonable if diabetes confers the same level of risk as CHD. There is strong evidence that controlling hypertension and hyperlipidemia reduces both macrovascular and microvascular complications in persons with type 2 DM. Clinicians need to focus more on controlling these other risk factors than on glucose levels. Such focus will have the largest impact. Weight control and regular physical activity are safe, effective ways to prevent and control DM. Clinicians need to familiarize themselves of the new and emerging drugs and to use them only if these drugs have shown safety and efficacy as documented in RCTs.

In summary, evidence suggests that CHD can be prevented in both women and men.

Underutilization of proven beneficial treatments is a contributor to less favorable outcomes in women.

Women at high-risk category – smoking cessation, diet therapy, weight maintenance, physical activity/cardiac rehabilitation, blood pressure control, and lipid control/statin treatment.

Pharmacotherapy of aspirin, beta-blockers, ACEI (ARBs if ACEI is contraindicated), glycemic control in the setting of diabetes mellitus (HgbA1C <7.0). Evaluation and treatment of depression, dietary supplementation of omega 3 fatty acids and folic acid are included in the recommended guidelines.

As medication adherence is a common cause of treatment failure, monitoring of side effects along with a good patient-provider relationship such as an open dialogue can be influential.

One of the DNP competencies in this particular case uses collaboration with the primary care physician or other specialty areas such as the endocrinologist in practicing evidence-based guidelines to attain a good DM control. As future DNP leaders, it is imperative to educate, not only the patients but also colleagues about the importance of following these guidelines and to take an active part in DM management and not simply pass on the responsibility to primary care providers for patient care. This can be achieved by maintaining an open line of communication with the primary care physician and other specialists.

Another DNP role is to influence health policy and systems of health care at the place of work by promoting cardiac rehabilitation that include exercise training, education, counseling and behavioral interventions to all eligible patients with established CHD especially in women. Focus groups might be an option for women with similar problems or issues. It is clear that patients with diabetes especially with coronary heart disease are at a high risk for subsequent cardiac events as in this case and women are at a disadvantage, therefore all efforts must be directed at medication adherence and risk reducing behaviors.

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Running Head: HEALTH DISPARITY CASE STUDY

WOMEN AND CARDIAC REHABILITATION

Health Disparity Case Study

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Health disparities refers to preventable differences in the indicators of health of different population groups, defined by race, ethnicity, gender, educational level, socioeconomic status, and geographic location of residence (Mensah, Mokdad, Ford, Greenland, & Croft, 2005). The factors that contribute to this persistent disparity include low level of awareness among the at-risk populations; obesity epidemic; inconsistent levels of screening and treatment of cardiovascular risks; cultural and social factors that influence lifestyle and behavior (Low, Groethe, Wofford, & Bouldin, 2007).

This case study seeks to analyze important health disparities in women with coronary heart disease (CHD), specifically minority women with associated low socioeconomic status in receiving cardiac rehabilitation. The current practice in this nurse practitioner's health organization will be described along with some recommendations for the DNPs in caring for this group of patients.

### *Epidemiology*

Cardiovascular disease is the leading cause of death in women, claiming the lives of more than half a million women each year about 1 death per minute. Approximately three million American women have a history of myocardial infarction and more than 400,000 are undergoing coronary artery bypass graft surgery or percutaneous intervention each year (Beckie, 2006). Women are at risk for acute coronary syndrome (ACS) due to less aggressive evaluation and treatment. Women with coronary heart disease (CHD) represent an underserved, high risk group for subsequent acute coronary syndrome (ACS). Women who survived a myocardial infarction (MI) have a double recurrence of MI and mortality during the first year compared with men. Women from ethnic minorities and rural areas carry a disproportionately higher burden of cardiovascular morbidity and mortality (Low, et al., 2007).

Women remain to be underrepresented in clinical trials and investigations especially in cardiac rehabilitation (Beckie, Fletcher, Beckstead, Schocken, & Evans, M., 2008). Comprehensive cardiac rehabilitation is effective in prolonging survival and reducing morbidity and disability after a coronary event (Scrutinio, & Giannuzzi, 2008). Despite the compelling evidence of the benefits of cardiac rehabilitation, referral and adherence rates in elderly and women are low. There is also limited number of studies about younger women with CHD (30-64 years). Women present unique, gender-specific challenges in risk factor management as depicted in the case below.

#### *Case Analysis*

Elaine is a 47 year old African American woman who was seen in cardiology clinic for a 2-week follow up visit after sustaining a non-ST elevation myocardial infarction (MI) with subsequent percutaneous intervention (PCI). Her cardiac risk factors include diet controlled diabetes mellitus, hypertension, hyperlipidemia and second hand smoke. She presented into the emergency room for 2 weeks of fatigue and in the morning of the event had nausea and diaphoresis as soon as she got out of the bus to work. She works full time as a librarian in town.

During the follow up visit, Elaine presented with anxiety regarding her recent cardiac condition. She reports that she is still in shock about the whole episode, as if she is emotionally paralyzed. She is afraid to walk or even do any physical exertion for fear of getting another MI. She is afraid to go to work. The past two weeks since hospitalization, she spent mostly sitting or lying down in the couch. However, she demonstrated readiness to change in her eating habits while she was in the hospital. She had her brother clean her refrigerator and fill it with low fat and low cholesterol food.

During the clinic visit Elaine was tearful as she reported to the nurse practitioner that she is overwhelmed with the whole situation. She indicated coping difficulties, exhibiting poor sleep since hospital discharge. She reports that she had been under a lot of stress the past two years which she thinks caused her recent MI. She has been struggling to keep a balance between work and family. She is the oldest of nine siblings. She takes care of her ailing father and is constantly worried about her two brothers who are on drugs. She has a 15 year old son who seems to be doing rather well. She attempts to keep her marriage intact but with difficulty due to some financial struggles as her husband is between jobs. She has a difficult time convincing her husband to avoid smoking and to support her in making the necessary changes in diet and exercise.

Elaine's case typifies a health disparity in CHD. Being a woman in general and specifically younger, African American, with low socioeconomic background present challenges in cardiac risk factor management. Data suggests that marked disparities exist in the prevalence, morbidity and mortality associated with CHD and its risk factors. The population subgroups adversely affected are blacks, low socioeconomic status and women (Mensah, et al., 2005). CHD is the most common cause of death in women but some of the challenges of management differ from those in men. Typically, women with CHD present later than men and are likely to suffer from co-morbidities such as diabetes and hypertension (Taggu, & Lloyd, 2007). However, Elaine has significant risk factors for CHD and at a younger age, the treatment and management are more challenging than what is currently known. Widowed or women with a partner or spouse often report a lack of social support or receiving inadequate coping assistance from their husbands. Women like Elaine, have greater responsibilities for household and caring chores, in addition to their jobs. Women reported greater psychological stress and lower self-efficacy, self-esteem and quality of life at the time of a first cardiac

event or the beginning of rehabilitation (Taggu, & Lloyd, 2007). Psychological status seems to be worse in younger women indicating that Elaine might need special attention and different counseling strategies like reassurance, encouragement and listening.

After a cardiac event it is difficult to motivate women than men to engage in regular physical activities. Age is the most consistent predictor of attendance to cardiac rehabilitation with least attendance in the younger (<49 years of age) and older (>70 years of age) (Beckie, et al., 2008) (Jeger, Jorg, Rickenbacker, Pfisterer & Hoffman, 2007). Lack of time is a reason for Elaine's inactivity. She reports family and social commitments as barriers to regular physical activity.

Elaine also displays psychological challenges especially anxiety and depression which could potentially affect attendance or adherence to plan of care for example, cardiac rehabilitation.

In follow up, Elaine is very active with her cardiac rehabilitation regimen although she is thinking of quitting prematurely due to lack of finances. She has changed her diet to low cholesterol and low fat diet. Her family is also on the same diet. Her husband is cutting back on smoking and if he does, he smokes out of the house. She has learned to say "no" to some of her guilt provoking responsibilities. She still sees her father on a regular basis but limited to caring for his needs. She changed her attitude about not worrying too much about what she cannot change – this includes her brothers' lives. She has more time for herself now, doing yoga and regular exercise. She attends some kind of free women's support group in the community once a month which she finds satisfying. She has lost approx 20 pounds few months after her cardiac event. She continues to adhere to her cardiac preventive medications. But most importantly, her relationship with her husband has deepened. They communicate more openly now and her husband has been more supportive.

*Suggestions for intervention/change strategies*

The nurse practitioner has important opportunities to educate Elaine about CHD risks and provide effective interventions to reduce these risks. As the nurse practitioner sorts out the contextual factors underlying Elaine's presentation to develop a plan of care, the following points have to be taken into consideration:

CHD in women is characterized by greater disability and a higher rate of morbidity and early death after an acute coronary event compared with men. Women also have lower participation rates than men in cardiac rehabilitation (Sanderson & Bittner, 2005). Psychological status seems to be worse in younger women indicating that this subgroup may need special attention in cardiac rehabilitation (Beswick, Rees, Taylor, Burke, Griebisch, et al., 2005) (White, Hunter, & Holtum, 2007). It is important to take into consideration gender-specific differences with regard to the effects of different counseling strategies.

It is crucial that there is a connection between the inpatient and outpatient care. Elaine shared her thoughts with the nurse practitioner that the most difficult time for her is the transition between inpatient and outpatient period post cardiac event. Therefore, there must be a coordination of care between the inpatient and outpatient services. An example is a communication between inpatient and outpatient staff. A nurse can make a telephone support follow up with the patient to discuss safety (for example, use of NTG, etc.) and assessment of coping strategies within 48 hours of hospital discharge.

There are not enough cardiac programs specially designed to meet the needs and preferences of women. Nurse directed cardiac rehabilitation program tailored to the needs of women following an acute cardiac event to address their psychological and social needs are found to be feasible and acceptable (Davidson, Digiacomio, Zecchin, Clarke, Paul, Lamb, Hancock, K., et al., 2007). Encouraging patients with similar

experiences to attend group visits help with coping strategies.

*Implications for nursing and potential impact for advanced practice and health policy*

CHD is the most common cause of death in women but some of the challenges of management differ from those in men (Taggu, & Lloyd, 2007). Cultural and social factors that influence lifestyle and behavior also have significant cardiovascular health consequences and contribute to the disparity. Coping with a cardiac event, women tend to minimize the impact of their health situation and avoid burdening their social contacts (Bjarnason-Wehrens, Grande, Loewel, Voller, & Mittag, 2007). Spousal and family support is helpful during these difficult times. It is important to include the family in the care of these patients. DNPs must encourage hospitals in their practice environment to create an effective patient education and referral system by engaging administrative support. Using data will provide performance feedback to physicians and staff which will in turn strengthen the case to use automatic referral process for cardiac rehabilitation and also will provide interdisciplinary communication to improve psychological support to women with CHD (Parkosewich, 2008) (Beckie, 2006). Enhancing healthcare providers' knowledge of diverse cultural and behavioral traditions may influence patient understanding of and adherence to recommended healthcare regimens (Gibbons, Jones, Gardner, Goldstein, Moller, & Yancy, 2008). More tailored education is required in hospital (phase I cardiac rehabilitation). A need for careful exploration of individual patient's perceptions of causal factors and earlier identification in hospital of patients who have erroneous beliefs about their illness (Murphy, Worcester, & Higgins, 2005). As DNP's leadership role evolve in clinical practice it is important to have an awareness of the extensively documented racial/ethnic and socioeconomic health disparities. Despite the

evidence showing significant risks, women tend to be underserved in the area of cardiovascular health. These health disparities must be overcome in order to provide excellent and effective care to the population we serve.

Closing the gap between evidence and practice is an important step such as utilizing the expert clinical guidelines to prevent mortality and morbidity in younger women with CHD. Utilizing cardiac rehabilitation is first and foremost in all cardiac patients' care but being cognizant of gender issues in cardiac rehabilitation will help eliminate the barriers that prevent these subgroups of patients in utilizing these proven strategies.

Every patient who had MI or is hospitalized for CHD should at least be considered as a candidate for rehabilitation at the time of discharge. This entails educating all health care providers to take a careful look at the clinical evidence thereby aggressively encouraging patients to partake in cardiac rehabilitation to improve quality of life, to stabilize or reverse the progression of heart disease. DNPs might consider increasing community awareness in women and heart disease and having patients and families be proactive in requesting for cardiac rehabilitation.

Different counseling strategies must be developed to deal with the gender-specific differences. Advice and giving information works best in reducing stress in men. Women respond better to lots of reassurance, encouragement and listening.

Understanding reasons why younger women's participation and adherence to cardiac rehabilitation exist is another step in preventing the dropout rates in these subgroup. Family and social commitments serve as barriers to participation in cardiac rehabilitation or in physical activity. Women need a lot of social support, reassurance from their families and friends. Therefore, women need intensive and individualized motivation and instructions compared to men.

Policy changes may be needed to improve access to treatment, including reviewing reimbursement rates and including rehabilitation services as one of the key indicators of quality services by getting the buy in from the hospital administrators. Finally more research is needed in preventing morbidity and mortality in younger women with CHD and DNPs should take an active role in this arena.

*Self- reflection on personal and professional leadership skills*

As a DNP candidate, I have learned during the course of my studies and clinical residency that it is crucial that NPs develop an awareness of health disparities along with the inconsistent level of screening and treatment for this group of patients. It is also important to consider the culture and social factors that influence the lifestyle and behaviors of women with CHD in general. Women's roles have been traditionally caregivers and they put themselves last. They minimize their symptoms and they do not usually adhere to cardiac rehabilitation due to their multiple roles as caregivers. Understanding these factors help in tailoring the care for this group of patients by recognizing their special needs. They need more emotional support, including their family/friends in their care and enlisting their support might be effective. One way is to start a support group for women with CHD. I have started to raise awareness among my co-workers and indirectly educating them and other providers during our monthly clinic meetings to improve consistency in taking care of women with CAD.

Currently, cardiac rehabilitation services in my particular health organization are being outsourced. Medicare patients are eligible for this particular service. Patients like Elaine are also eligible, however they have to provide co-pay for most of the services which is sometimes difficult especially for those who have limited finances. There is also no structured secondary prevention program geared towards the young women affected with heart disease in my organization. As potential leadership roles I have started to study our organizational system-level readiness to change including innovative practice within the department, followed by

partnering with administration in the development of group visits for CHD secondary prevention as a start, followed by active participation in cardiac rehabilitation committee. Understanding barriers to change include communication with the cardiologists, hospitalists, primary care providers and inpatient managers to buy into automatic referrals of all patients to cardiac rehabilitation or secondary prevention programs like the group clinic visits.

Another leadership role is working with the multidisciplinary team which includes the pharmacist, social worker and the dietician in setting up the group visits. Another potential leadership role in the future may include participating in research in this particular group of patients to help develop guidelines in improving quality care for younger women who are at most risk for future cardiac events.

For those patients who are not eligible and cannot afford cardiac rehabilitation, DNPs have the potential to appeal to the community to establish a scholarship fund. This can be done by spearheading volunteer activities to raise funds.

In summary, if DNPs were to make a difference in reducing mortality, morbidity and disability from CHD, we must overcome the racial, ethnic and socio-economic health disparities. More research is needed not only in determining short term but also long term effects of cardiac rehabilitation but also in age/gender specific differences. Women may benefit from a supportive and individualized therapy targeted to improve the health of women who are underserved in the area of cardiovascular health.

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Running Head: GROUP VISITS - DNP LEADERSHIP CASE REPORT

Advanced Practice Nurse-Led Multidisciplinary Group Clinic Visits

In

Secondary Prevention of Coronary Heart Disease

DNP Leadership Case Report

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## Advanced Practice Nurse-Led Multidisciplinary Group Clinic Visits in Secondary Prevention of Coronary Heart Disease

### *Abstract*

One of the competencies for the doctor of nursing practice (DNP) degree is to develop a practice change innovation such as an intervention that aims to influence population or individual health outcomes for individuals or population in an advanced practice nurse's (APN) specialty. This case report presents a pilot APN-led multidisciplinary group clinic visits for secondary prevention of coronary heart disease (CHD) intervention. The implementation and evaluation of the pilot program incorporated key qualities of successful practice change innovation: effective team leadership, collaboration with other health care professionals, application of evidence based practice and understanding of organizational climate. The pilot study was guided by a transformational leadership framework. Primary outcomes were feasibility and acceptability. Secondary aims were to determine if participation in the group visits was associated with changes in risk reduction behaviors or risk factor outcomes. The main finding of this pilot study is that the APN-led multidisciplinary group clinic visit program is feasible and acceptable to those patients who chose to participate. Participants would like this program to continue and expressed appreciation of the service. The multidisciplinary team's enthusiasm contributed to high quality provider performance during the group visit sessions and participants' satisfaction with the service.

**Keywords:** transformational leadership, coronary heart disease, group clinic visits, evidence-based practice

Among the standard competencies of a doctor of nursing practice (DNP) is to develop a practice change innovation that influences individual or population-level health outcomes in an advanced practice nurse's (APN) specialty area (AACN, 2006). Effective team leadership, collaboration with other health care professionals, application of evidence based practice, and an understanding of organizational climate are among the qualities that a DNP must possess in successful innovation. (AACN, 2006). This case presents an example of how a nurse practitioner applied the DNP leadership principles in the implementation and evaluation of a pilot practice change innovation project. The pilot incorporated and applied evidence-based practice (EBP), collaborative management of a multidisciplinary team, and an understanding of the organizational climate. This article focuses on the DNP leadership qualities necessary to implement a practice change innovation with the potential to improve secondary prevention of coronary heart disease (CHD) among cardiology patients. This paper will briefly review secondary prevention of CHD, present the pilot study setting and findings then turn to a discussion of the role of APN leadership in this project.

### *Background and significance*

Patients with a history of CHD have a high risk of subsequent myocardial infarction (MI), stroke and death (Hennekens & Cannon, 2008). Implementing evidence-based guidelines (Murphy, et al. 2005) for comprehensive secondary prevention of CHD [including cardiac rehabilitation] can reduce the incidence of subsequent MIs and improve quality of life (Thomas, King, Oldridge, Pinam & Spertus, 2007). However, secondary prevention therapies to decrease mortality and morbidity are underutilized (Gluckman, 2004). The goal of secondary prevention (including cardiac rehabilitation) is to improve functioning and provide information, guidance and support. Secondary prevention is especially helpful during the first month after a cardiac event or a revascularization procedure which has been shown to be the most difficult period during the entire recovery period (Shumaker & Czakowski, 1994). Shumaker and Czakowski

further stated that recovery from a myocardial infarction or cardiac surgery is often accompanied by a host of psychological and physical problems including loss of energy, recurring chest pain, dependence on others and tension in social relationships. Despite a well documented 20% reduction in mortality among patients participating in either secondary prevention program or cardiac rehabilitation program compared to patients who do not participate, (Cooper, Cutler, & Desvigne-Niclaus, 2005), there are barriers to cardiac rehabilitation referral and to patient's participation. Reasons for nonparticipation include lack of physician referral, poor patient motivation and logistical or financial constraints (Cooper, et al; Thomas, et al., 2007). In addition, the average hospital stay for acute coronary syndrome (ACS) has been shortened, which complicates the provision of secondary prevention by limiting the opportunity to counsel these patients.

#### *Pilot study setting and findings*

There is no formal secondary prevention program for coronary heart disease in this nurse practitioner's (NP) institution. Cardiac rehabilitation and revascularization procedures such as coronary artery bypass graft surgery (CABG) and percutaneous intervention (PCI) are currently referred out to other institutions. However, there was a plan in place to internalize (offer the services on site) revascularization procedure at this institution, providing a unique opportunity to pilot an on-site secondary prevention program. Currently, CHD patients who underwent revascularization procedures or who were discharged after an acute coronary syndrome (ACS) or myocardial infarction (MI) without revascularization (treated medically) are seen in follow up by NPs and physician assistants (PA) two weeks after hospital discharge. These patients are seen in traditional one-on-one follow up visits. This pilot study was conducted to determine if group visits are feasible and acceptable to CHD patients. This APN-led multidisciplinary group clinic visits are based on evidence-based guidelines for secondary prevention of CHD and are an innovative model for the secondary prevention of

CHD.

The multidisciplinary team includes the NP, clinical pharmacist, social worker and dietician. A group clinic visit is a scheduled visit for a group of patients with common health problems or concerns. The group visits provide an opportunity to integrate clinical services, education and group support. The APN's project satisfies one of the competencies for the DNP which is to develop a practice innovation that influences health care outcomes for the NP's area of specialty, cardiology.

The aims of this pilot study were: (1) to determine the feasibility and acceptability of APN-led multidisciplinary group clinic visits in secondary prevention of CHD in this practice setting, (2) to assess changes in risk reduction behaviors (medication adherence [ASA, statin, ACEI, beta-blocker if appropriate], smoking cessation, regular physical activity and diet adherence), and (3) to assess changes in risk factor outcomes (improvements in LDL cholesterol, blood glucose, weight and blood pressure).

The main finding of this pilot study is that the APN-led multidisciplinary group clinic visit program is feasible and acceptable to those patients who chose to participate. Participants would like this program to continue and expressed appreciation of the service. Participants also offered suggestions for future group visits especially around logistical and scheduling issues to improve access and participation and feedback to improve our measurement tools especially for the diet adherence instrument. The multidisciplinary team's enthusiasm contributed to high quality provider performance during the group visit sessions and participants' satisfaction with the service.

We documented significant changes in pre- and post-group visit participation self reported physical activity and blood glucose, despite our small sample size. In addition, incremental improvements in LDL cholesterol were noted. No clinically significant changes in weight and blood pressure were noted. The next sections focus on NP leadership in

implementing the pilot secondary prevention project.

*Context for decision-making*

Health care organizations in the 21<sup>st</sup> century face challenges in meeting the performance expectations of critical stakeholders, consumers, payers and regulators (Wells & Hejna, 2009). Challenges in today's health care delivery environment include limited reimbursements, reduced operating margins, shortages of health care professionals, burdensome requirements to document performance and safety indicators and increased scrutiny by the public and by the government (Stefl, 2008). Stefl further stated that "today's health care executives and leaders not only must have management talents tailored to match the increased complexity of healthcare environment but also to demonstrate measurable outcomes and effectiveness to practice evidence-based management". Evidence-based practice requires translating research findings into practical use (Van Patter Gale & Schaffner, 2008). In this particular institution, the mission is to provide high quality, cost effective and evidence-based care to patients. APNs are well positioned to provide leadership in facilitating practice innovation to meet the institutional mission. Collaboration (especially during the internalization period) with health-care and allied professionals (clinical pharmacist, dietician, and social worker), the cardiology staff and the administration is crucial in this institution to meet its mission. APNs may share their knowledge and expertise not only in their own practice, but also in system-level change and policy formulation, which is important in health care innovation and program development. APNs have been identified by the regional chief of cardiology as appropriate for leading this new program at this institution.

Innovation in this particular cardiology clinic includes researching new ways to provide patient care (i.e. group instead of the traditional instead of individual clinic visits), supporting an environment of empowerment of multidisciplinary staff, and evaluating and sustaining change. Our chief of cardiology is supportive of innovation. Hill (2009) suggests that "in order to

inspire and lead change, it is important to surround oneself with talented people by identifying talent, seeking out leaders who will support the innovation change and supporting these individuals as they go about doing the work to create, a vision, and working collaboratively with other departments”. The NP started with a vision by identifying the issue or problem, possible solution, then discussing with the regional chief of cardiology to seek guidance and support. Support from leadership and collaboration with other providers was crucial to our goal: the development of an alternative method of providing care to cardiac patients, such as group clinic visits which incorporate evidence-based guidelines and may be cost-effective if successful at preventing subsequent service utilization for CHD events.

The implementation of the pilot program was guided by key principles in the organizational change literature. Changing organizational culture around a practice requires that the change is consistent with the organizational philosophy and political agenda and that resources are available to support the change (Van Patter Gale & Schaffner, 2009). The organizational philosophy of this particular institution is to deliver high quality, safe health care services to patients. The political agenda during the pilot study included the internalization project. There was a sense of urgency in this project due to the timeline of the internalization project which contributed to the successful launch of the pilot program. Successful organizational change also depends heavily on effective leadership.

### *Leadership*

Leadership is the ability to inspire individual and organizational excellence to create and attain a shared vision and to successfully manage change to attain the organization’s strategic ends and successful performance (Stefl, 2008). Kirby and Robertson (2009) discuss business intelligence in leaders of innovation and suggest that health care organizations start small, align organizationally, and leverage success. Clear targets and transparent factual data can facilitate achievement of goals, and desired outcomes. A clear purpose, starting with a manageable scale

and using feedback to retool strategy is also crucial to the success of the program. If you do not know where you are going, you cannot create the appropriate measures to tell you that you have arrived. The best leaders tend to view all issues as strategic (Waymack, 2008). During our multidisciplinary meetings, we made sure that we reviewed our goals and desired outcomes and constantly used feedback to retool our strategies.

### *Leadership qualities*

A dedicated project lead person (change agent of champion) is important to a successful implementation of a practice change innovation. Having knowledge of change process, the barriers and drivers to practice change in the work setting is also important to a successful implementation (Van Patter Gale & Schaffner, 2009). It is important to have the knowledge of the institution's layers of management including the chain of command and their respective responsibilities.

Van Patter Gale & Schaffner (2009) also discuss the characteristics that a champion needs to possess: drive, a positive enthusiastic approach, knowledge of the project, good communication skills and status to lend the person and thus the innovation, credibility in the eyes of the medical staff. Champions occupy a key relationship with staff, possess the ability to analyze the staff's abilities and must have good interpersonal and negotiation skills.

Communication and relationship management – the ability to communicate clearly and concisely, establish and maintain relationships, and to facilitate constructive interactions with individuals and groups – are key qualities of a leader (Stefl, 2008). Professionalism – the ability to align personal and organizational conduct with ethical and professional standards that include responsibility to the patient and community, and knowledge of the health care environment are also central to leadership (Stefl, 2008).

According to Kirby & Robertson (2009), organizational alignment means to execute impeccably. A typical hospital institution has multitude of disparate data sources, competing

priorities and limited resources. “Match the data with the strategy, determine the appropriate measures”. No need to “reinvent the wheel” - select the best practice metrics (various governmental agencies, clinical initiatives, benchmarking organizations (Kirby & Robertson, 2009). The key to this entire process is to get the right information into the right hands at the right time, determine the root cause of the problem, what is it that we want changed or improved? The change process goes through a series of phases. Skipping steps creates only the illusion of speed and never produces satisfying results. Critical mistakes in any of the phases can have a devastating impact, slowing momentum and negating hard-won gains (Kotter, 1995).

#### *Transformational Leadership framework*

Transformational leadership has been conceptualized as leadership targeted at change and innovation (Eissenbeiss, Knippenverg, & Boerner, 2008). Eissenbeiss et al., proposed a theoretical model in which the effect of transformational leadership on team innovation is mediated by support for innovation and moderated by climate of excellence. “Transformational leaders do not settle for current states but display unconventional and creative behavior and serve as role models for innovation”. Transformational leadership enhances supportive behavior among team members by sharing a concern for high quality performance. As teams with a “high level of climate for excellence” are willing to work harder and to the maximum of their ability, they are more likely to overcome obstacles during the implementation process in order to transform selected ideas into sizeable improvements in practice. Key concepts in transformational leadership (Wolf, Hayden, & Bradie, 2004) are vision, leadership, organizational culture, performance improvement systems, information system and resources.

#### *Self-reflection*

In our institution, the primary care department has implemented diabetes group clinics, the neurology department is currently providing headache group clinic visits and there is a group visit on pain management in this region, which proved to be successful and is ongoing.

Clinicians and managers alike have thoughts on how we can provide excellent care to a group of patients cost effectively. For several years, there had been plans establish group visits in this particular cardiology clinic. These plans included starting atrial fibrillation group clinics and group visits for patients undergoing electrophysiology procedures however, there had been no discussion about secondary prevention. Group visit plans in the cardiology department all stopped at the beginning stage. They were not piloted or implemented due to logistic, scheduling and resource challenges. These were good plans with the potential to produce positive patient outcomes, but were not made a priority.

The question for the DNP student was what went wrong or why these previous plans reached a standstill? In this particular scenario, what was needed for the DNP student to be able to overcome the obstacles of going beyond the planning stages and implement the group visits? Upon reflection, the successful implementation of the group visits can be explained by three key factors: (1) The DNP student was able to integrate the material from course work and experience as a cardiology APN to apply principles of leadership and advance her DNP competencies; (2) There was tremendous support from the chief of cardiology of this region; she is among the transformational leaders in our institution due to her unconventional and creative management style; (3) The timing of pilot also came at an opportune time during the internalization project, which was linked to a sense of urgency and strong institutional support for the secondary prevention of CHD group visit program.

The DNP competencies (Council for Advancement of Comprehensive Care DNP competencies, 2006) addressed by this project are to provide leadership in (1) practice innovation that influence health care outcomes for individuals and population in the area of specialty and (2) in establishing and utilizing a collaborative interdisciplinary network to provide optimum patient care in accordance with ethical and professional standards.

The initial step for this DNP student was to identify a problem for clinical inquiry. There

was no secondary prevention program in existence and evidence-based secondary prevention guidelines appeared to be underutilized in this cardiology department. The next step was to gather relevant data and identify available resources. Developing an understanding of the local and regional health care systems, including the social, political and cultural climate and layers of management of the organization was part of this data gathering phase.

Another important element of the data gathering was to understand what had come before; there was no need to reinvent the wheel. The DNP student interviewed people involved in practice change innovation and learned about existing successful programs in other regions and their strengths and limitations. Next the DNP student assessed whether existing program models could be applied to the population, medical department and institution in question. Goal-setting was an important next step: short and long term goals were made explicit. The multidisciplinary team group visit model was articulated as the program goal. Leadership skills such as professionalism and communication were applied in evaluating and recruiting potential dependable, trustworthy and competent multidisciplinary team members. The DNP student's role in leading and directing the multidisciplinary team was greatly facilitated by the high level of enthusiasm among team members for the group visits. This enthusiasm also translated into high quality team performance in carrying out the group visits, which then affected participants' satisfaction with the program and overall success of the pilot program. The challenge was how to temper their enthusiasm through effective communication skills and sensitivity. Different leaders and managers within the institution and in different regions were interviewed by the DNP student; these data provided insights on different leadership styles and clarified barriers and drivers of change.

Effective communication was important in every aspect of this program, from facilitating the success of the multidisciplinary team and staff by matching their abilities to the work, to carrying out the larger institutional mission to provide safe, quality care to patients. Effective

communication is also crucial when negotiating with hospital business managers to advocate for the group visit program.

### *Future work*

The DNP student's next challenge is to build a business proposal that makes the case for the sustainability of the secondary prevention of CHD group visit program. Another important next step is to incorporate participant feedback to improve the program (e.g. scheduling and logistics) – this iterative approach is key to effective leadership, as discussed above. There are many opportunities to expand leadership roles for DNPs. A DNP could work to facilitate the work of other APNs to develop similar programs in other areas of cardiology, such as atrial fibrillation, congestive heart failure, and patients with pacemakers. Another potential DNP role is to influence local policies around referral for secondary prevention. A DNP could work with hospitalists and primary care providers to refer patients to secondary prevention programs and increase utilization of this important service. The potential cost-effectiveness of secondary prevention group visits deserves scrutiny; a DNP could design and conduct a cost-effectiveness analysis using clinical data. Promoting CHD prevention in the community might be other options for future projects for the DNP. This DNP student also noted areas of personal improvement resulting from participation in this project. This experience conferred enhanced assertiveness and negotiation skills in dealings with barriers and influencing the drivers of change within the institution. In addition, the DNP student had the opportunity to improve motivational skills to facilitate patient lifestyle changes. Finally, dissemination of this project via peer-reviewed journals, conferences and word of mouth could provide an example and encourage other APNs to grow in their areas of specialty.

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Running Head: OBSTRUCTIVE SLEEP APNEA AND CORONARY HEART DISEASE

Obstructive Sleep Apnea and Coronary Heart Disease

A Case Study

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Emerging studies are showing that sleep related breathing disorders are highly prevalent in patients with established cardiovascular disease (Somers, et al., 2008). It is important for clinicians to recognize patients with cardiac disease who have co-existing sleep apnea, to understand the mechanism by which sleep apnea may contribute to the progression of cardiac condition and to identify strategies for treatment (Somers, et al.). This case study describes obstructive sleep apnea as it relates to the cardiac patient and discusses current guidelines for identifying and treating this condition.

### *Case Presentation*

JB is a 54-year-old Caucasian male who was seen for a routine 2-week postoperative visit at the cardiology clinic by the nurse practitioner. He underwent coronary artery bypass graft (CABG) surgery x 4 vessels in early December. He presented to the emergency room by a private vehicle, approximately 5 o'clock in the morning after his wife found him exceedingly difficult to arouse. This was very uncommon for him. He was having labored breathing. By the time the paramedics arrived, the patient was waking up and was feeling well. JB and his wife elected to go by private vehicle for evaluation.

In the emergency room, he was found to have non-ST elevation myocardial infarction, manifested by troponin elevation. His EKG showed ST segment depressions and thus was sent directly for coronary angiography. The patient had some impressive diffuse coronary artery disease. Surprisingly, he had preserved left ventricular function. The cardiologist's assumption was what he experienced that early morning may well have been a malignant arrhythmia that led to his lack of perfusion and change in neurologic status. He spontaneously reverted to a perfusing rhythm long enough to be evaluated in the emergency room.

He was then referred for revascularization surgery. The patient underwent CABG x 4 vessels, (left internal mammary to left anterior descending artery, saphenous vein grafts to diagonal and right posterior descending artery, left radial artery to obtuse marginal artery). His postoperative course was notable for confusion and ataxia with narcotics and sedatives (Ambien) which resolved after discontinuing the above medications.

His discharge medications were Metoprolol 25 mg 1 tablet twice daily, Zocor 40 mg at bedtime, ASA 325 mg 1 tablet daily, Paxil 10 mg 1 tablet daily, Tylenol 1000 mg every 6 hours and Naproxen 500 mg 1 tablet twice daily.

His cardiac risk factors are obesity with BMI >30, hypertension, impaired fasting blood glucose, history of tobacco use (quit 6 months ago). He drinks two glasses of wine with dinner. He has a history of depression and anxiety, disorder diagnosed one year ago, restless leg syndrome, and degeneration in addition, spondylosis of the cervical intervertebral disk. He works as a truck driver.

During the visit, he complained of insomnia due to sternal incisional pain, nonproductive cough, fatigue and poor appetite. He had lost the water weight postoperatively and is back to his preoperative weight. He does not do much but sit around the house due to fear of hurting more. His wife is concerned about his condition and is wondering if this is usual postoperative course. Per wife, he is not motivated to do anything around the house. The rest of the review of systems was negative except for snoring per wife.

His blood pressure was 104/68, heart rate of 60, respiration rate of 16, oxygen saturation of 98%, temperature of 98.0. There were no significant findings in his laboratory report, which included CBC, chemistry-7, tsh, liver function tests. His chest X-ray showed small pleural effusion, expected after open-heart surgery. His EKG showed sinus rhythm with nonspecific

ST-T wave abnormalities. His physical examination showed no significant abnormalities with the usual postoperative findings.

He was prescribed Vicodin 1-2 tablets every 4 hours as needed for pain, and hopefully to help him sleep and suppress his cough. He was cautioned on the use of Vicodin since he had confusion during the immediate postoperative course. He was counseled to call the cardiology advice nurse for problems associated with the narcotic use. He was then referred for cardiac rehabilitation and sleep evaluation to check for obstructive sleep apnea. The nurse practitioner spent more than 50% of the visit with counseling, post operative teachings and warned them of what symptoms to look for regarding postoperative complications. Risk factor modification was emphasized including weight reduction, heart healthy diet, psychosocial issues especially with preexisting anxiety and depression. Detailed exercise prescription along with the usual postoperative teachings were discussed. Two-week follow up visit with the nurse practitioner was arranged along with the phone appointment in two days to check on his progress.

### *Background and significance*

Strohl (2009) defined obstructive sleep apnea (OSA) as more than 15 apneas [cessation or near cessation of airflow 20% from baseline for at least 10 seconds], hypopneas [reduction of airflow at least 30% from baseline for at least 10 seconds] or respiratory effort related arousals (RERAS) [sequence of breaths that lasts at least 10 seconds leading to arousal from sleep] per hour of sleep in an asymptomatic patient or more than five apneas, hypopneas, or RERAS per hour of sleep in a patient with symptoms (sleepiness, fatigue, or inattention) or signs of disturbed sleep (snoring, restless sleep, and respiratory pauses). Patients with OSA experience repetitive upper airway obstruction during sleep which induces asphyxia despite an increase in respiratory

effort, which produces an arousal from sleep which restores upper airway patency, allowing normal breathing and restoration of normoxia (Tamisier & Weiss, 2009).

Obstructive sleep apnea affects 15 million adults in the US and is present in a large proportion of patients with hypertension, type 2 DM, coronary heart disease, stroke and atrial fibrillation (Somers, et al. 2008). One in five adults has at least mild OSA, and one in fifteen has moderate or severe OSA. More than 85% of patients have never been diagnosed. The risk factors for OSA (Foster, 2008) include: BMI>25, neck circumference >17 inches for males, >16 inches for females; family history; middle age; craniofacial abnormalities; alcohol use; smoking; gender (primarily in males and in postmenopausal women); ethnicity (African American, Hispanic, Pacific Islander). The symptoms of OSA (Foster, 2008; Antic, 2009) include periods of apnea and snoring, excessive daytime sleepiness, poor concentration, memory loss, irritability of depression, dry mouth and morning headaches.

Somers and colleagues (2008) outline the mechanism of apneas and associated cardiovascular risk such as intermittent hypoxia and CO<sub>2</sub> retention during sleep with oxygen saturation dropping to as low as 60%, disrupting the normal structured autonomic and hemodynamic response to sleep; chemoreflex mediated increase in sympathetic activity to peripheral blood vessels with consequent vasoconstriction and blood pressure rise to as high as 240/130 mmHg; endothelin levels rise in addition, hypoxemia triggers systemic inflammation, which may all contribute endothelin dysfunction; increased platelet activation with potential markers for thrombotic risk; increases in intrathoracic pressure, which causes increased afterload, increase in atrial size and impaired diastolic dysfunction.

The risk of an adverse cardiovascular outcome is high among patients who have both OSA and known CHD (Tamisier & Weiss, 2009) as was shown in a prospective cohort where

polysomnography was performed in patients with CHD, the incidence of major adverse cardiac events (cardiac death and reinfarction) was higher among patients with OSA than those without OSA. OSA is associated with multiple vascular risk factors including decreased high density lipoproteins, increased C-reactive protein, increased homocysteine, and elevated blood glucose (Tamisier & Weiss). Nocturnal bradycardia, ventricular asystole and recurrent atrial fibrillation have also been observed in patients with OSA (Somers, et al. 2008; Tamisier & Weiss).

According to Kline (2009), OSA is confirmed in only 50 to 60% of those suspected of having the disorder based on subjective clinical impression. There are questionnaires such as the Berlin Questionnaire that identifies patients likely to have OSA in primary care visits, whereas the STOP Questionnaire predicts OSA in preoperative patients. However, a simple questionnaire, the Epworth Sleepiness Scale (ESS) is a rapid screen to identify significant sleepiness in patients wherein daytime sleepiness can be masked by activity especially useful in truck drivers (Antic, 2008). Polysomnogram is the gold standard for diagnosis, which evaluates sleep characteristics, respiratory effort, airflow oxymetry, EMG, EKG, REM, limb movements, etc. in a monitored facility (Foster, 2008). Onen (2008) described an easy to use bedside tool which has a high sensitivity and specificity in screening of OSA as well although not as accurate as the polysomnogram.

### *Treatment*

Treatment of OSA with positive airway pressure (Basner, 2007) appears to reduce the incidence of CHD and nocturnal arrhythmias whereas the impact of other therapies such as oral appliances, pharmacotherapy, surgery, tracheostomy on CHD is unknown (Tamisier & Weiss, 2009; Somers, et al. 2008).

Some patients may continue to experience excessive daytime sleepiness despite treatment due to co-morbidities and modafinil (Provigil) is a wake-promoting medication approved by the FDA for treating sleep apnea symptoms of sleepiness (Foster, 2008) in conjunction with the continuous positive airway pressure (CPAP). It has no effect on respiratory events and is not used alone as treatment.

*Suggestions for interventions/change strategies*

JB is overweight and had labored breathing along with possible syncope in sleep during the initial presentation. This might have been due to a serious arrhythmia, therefore obstructive sleep apnea needs to be ruled out. Referring the patient to the sleep clinic is an important step to prevent morbidity and mortality in these types of patients.

NPs can promote better health for patients by routinely asking about symptoms of OSA especially in cardiology practice after reviewing the above literature. Referring patients to polysomnogram or sleep clinic when appropriate is the next step. Collaboration with sleep medicine specialist is also another recommendation to appropriately care for these patients. JB was open to sleep clinic referral although the idea of possibly using a CPAP machine as a treatment option was not attractive to him. Making him understand the implications of treatment noncompliance is very important to prevent developing malignant arrhythmia.

Weight loss for all patients who are above an optimal goal is also listed in the treatment options. Treatment adherence can be reinforced if the provider shows interest in supporting patients in the very beginning. There are support groups for sleep apnea as there are challenges with some of the treatment options especially difficulty in tolerating pressure facemask. CPAP must be used for a minimum of 4-6 hours nightly to provide an optimal effect. Regular follow up

with the sleep technician until the comfortable fit with the appliance is reached is essential in improving treatment adherence.

Avoiding sedatives is an important part of the treatment of sleep apnea because apnea may be worsened as the respiratory drive is reduced. Alcohol as well as caffeine have been shown to dramatically worsen apnea severity while hypnotics and sedatives can also worsen upper airway dysfunction during sleep (Feinsilver, 2009) and should be used cautiously particularly in the surgical patient. Therefore, close follow up with JB's response to narcotics and sedatives is important especially when he had some reaction to certain narcotics while in the hospital. Fortunately, he did not have reactions to medications after hospital discharge.

*Implications for nursing and potential impact for advanced practice*

Coronary Heart Disease alone is not an indication for diagnostic evaluation of OSA, instead, CHD should prompt the clinician to consider whether there is other evidence of OSA and whether diagnostic evaluation is indicated on that basis. Collaboration with sleep medicine specialists and treating patients in an individualized approach along with their co-morbidities are suggested in the literature (Somers, et al. 2008). In addition, structured sleep medicine education in cardiovascular training are lacking. There are logistic and economic obstacles to diagnosing and treating sleep apnea that need to be taken into consideration. In addition, other morbidities including obesity may obscure clearer understanding of any cardiovascular consequence of OSA. Further, treatment options are mostly device based and are not easily tolerated at first. Therefore multidisciplinary strategy is appropriate evaluation of OSA is recommended as well as individualized approach to evaluation and management of these patients with co-morbid cardiovascular disease (Lamm, Poeschel, & Smith, 2008).

*Self-reflection on personal and professional leadership skills*

This case study gave me a deeper understanding on improving the care of patients with cardiac conditions especially in CHD. Carefully screening CHD patients for obstructive sleep apnea and collaboration with sleep medicine specialists and/or referral to sleep clinic as appropriate are also essential in my secondary prevention care for my patients.

Limited clinical resources result in long patient wait, in our institution, there is an average of 6-8 week wait list to be seen for initial consultation with sleep clinic, followed by another few weeks before having the sleep study, another few weeks to be fitted for the appliance. Therefore, potential future project for the DNP might be to pilot a nurse-led model of care for our institution. A RCT has been done wherein the nurse-led model of care was cost effective, and has cut 20-25% wait time and documented comparable health outcomes in symptomatic moderate-severe OSA with physician instituted care (Antic, 2009).

Another recommendation is for cardiovascular clinicians undergo a structured sleep medicine education or training program in diagnosing and being aware of sleep apnea treatment. Guidelines for cardiac treatment must also include screening and assessment of sleep apnea on obesity as co-morbidity for CHD and cardiac arrhythmia Potential DNP role is by participating in research in OSA and CHD progression and in promoting screening for OSA as part of secondary prevention guidelines for CHD. This also can be a part in pre-operative screening for cardiac surgery or any type of surgeries requiring general anesthesia.

In conclusion, emerging studies are showing that evidence of cardiac disease such as CHD and cardiac arrhythmia may have been activated by obstructive sleep apnea. As a DNP, important next steps in understanding and treating OSA in order to influence health outcomes of this population is through collaborative or multidisciplinary strategy for integrated patient care

such as diagnosing and early treatment as appropriate with better tolerated therapy options delivered via cost effective model of care.

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Running Head: THE ELDERLY AND CARDIAC REHABILITATION – A CASE STUDY

THE ELDERLY AND CARDIAC REHABILITATION

A Case Study

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Many clinicians greatly underestimate the life expectancy in the elderly. In 1999, Lavie & Milani reported that the average 65-year old patient can expect to live an additional 15 to 20 years and function independently for greater than 70% of this time. Even the very elderly patients (e.g., >80 years) can expect to live 7 to 10 more years and function independently for about half of this time. Therefore, preventive cardiology is important in this fastest-growing segment of society. There is substantial evidence suggesting that there is a strong age bias for many preventive services especially cardiac rehabilitation (Lavie & Milani).

This case study analyzes how an extraordinary elderly lobbied for her health with a tremendous social support from her daughter. This case study also discusses the recent AACVPR/ACC/AHA recommendations on cardiac rehabilitation especially for the elderly. The advanced practice nurse possesses a unique ability to maximize quality of care in enhancing elder independence through supportive self-care strategies based on patient's individual needs and utilizing family support. This case study offers strategies on advanced practice nurse's roles in caring for this group of patients specifically in cardiac rehabilitation.

### *Epidemiology*

Coronary heart disease (CHD) continues to be a major threat to health in older Americans and remains the leading cause of mortality in the United States accounting for 84% of persons 65 years or older dying from this disease (Hanna & Wenger, 2005). Lavie and Milani (1999) posited that CHD accounts for more than three fourths of total deaths and more than half of all acute myocardial infarctions (MI) in the United States. When older patients have an acute CHD event, they often require longer hospitalizations and develop more deconditioning, and they have considerably higher morbidity in addition, mortality (Lavie & Milani).

The elderly are an at risk population because they have increased risk for adverse health

outcomes, a need for health services, and unique social circumstances. Elderly persons need services for personal care and independent living. Social circumstances also make the elderly an at-risk population, shrinking social networks, loss of income, changes in living arrangements, and lifelong problems such as poverty have an impact on the well-being of elderly adults (Watts & Crimmins, 2008).

Cardiac rehabilitation as defined by the US Preventive Health Services and the American Heart Association are comprehensive, long-term programs involving medical evaluation, prescribed exercise, cardiac risk factor modification, education and counseling. These programs are designed to limit the physiologic and psychological effects of cardiac illness, reduce the risk for sudden death or re-infarction, control cardiac symptoms, stabilize or reverse the atherosclerotic process and enhance the psychosocial in addition, vocational status of selected patients (Thomas, King, Lui, Pina, & Spertus, 2007). Published randomized controlled trials showed that exercise based cardiac rehabilitation services are beneficial for patients with established CHD. The benefits include improved processes of care and risk factor profiles that are closely linked to subsequent mortality and morbidity. Mortality benefit of approximately 20-25% and a trend towards reduction in nonfatal recurrent myocardial infarction over a median follow up of 12 months (Thomas, et al.). Historically, cardiac rehabilitation services have been underused, especially by elderly women. Even when the elderly are referred, the strength of the referral is often weaker in the elderly, thus further decreasing the actual attendance rate of cardiac rehabilitation in the elderly. Participation in secondary prevention programs has been estimated at 20 percent of eligible patients, with even worse long-term adherence rates. Participation further decreases over time. A number of barriers have been identified: notably, lack of recognition and referral by physicians and perceived or real financial and logistic impediments by patients wishing to enroll (Thomas, et al.) (Lavie & Milani, 1999).

### *Case Analysis*

Teresa is an 81-year-old delightful elderly woman who was physically active up until several weeks prior to hospital admission. She had been golfing regularly in the summer of 2007. In the summer of 2008, she had recurrent hospital admissions for congestive heart failure, poorly controlled atrial fibrillation and over diuresis. An echocardiogram showed pulmonary hypertension, moderate aortic stenosis and insufficiency. She requested to see a cardiothoracic surgeon.

Multiple cardiologists reviewed a series of echocardiogram and she had been advised that she did not need a surgeon, and recommended medical therapy to control her atrial fibrillation, blood pressure control and adjustment of her medications. In the late summer of 2008, she was fairly frail and deconditioned with shortness of breath with minimal exertion. She had been admitted for urinary tract sepsis and delirium and subsequently went into fluid resuscitation and acute renal failure. Two months later she was readmitted for confusion and dehydration due to narcotic usage for her compression fracture of the spine. In fall of 2008, she was admitted for decompensated heart failure from rapid atrial fibrillation. Then one month later was readmitted for slow ventricular response due to medications and was discharged to home after two days. A week later, she was back in the emergency room with severe shortness of breath, was found to be in acute renal failure, severe metabolic acidosis and hyperkalemia. She was severely bradycardic due to over diuresis and medications, was intubated and was fluid resuscitated, potassium was corrected and finally extubated after a couple of days. Per the cardiologist's estimate that any cardiac surgery would have a 40% stroke and death rate and if all valves were replaced she will have a 65% chance of mortality. It was therefore elected to adjust her medications and send her home.

In the meantime, she felt better and presented herself to the cardiac surgeon's office on her own. Based on this presentation, the surgeon agreed to do surgery after the completion of her cardiac work up, which included a cardiac catheterization. The catheterization showed an 80-85% stenosis of

the first diagonal, severe stenosis of the third obtuse marginal and mild disease of the circumflex system. The patient was scheduled for surgery.

Few days before the anticipated surgery, she fell and sustained an avulsion fracture of her greater trochanter and was bedbound, therefore the surgery was cancelled and she was sent to a skilled nursing facility for rehabilitation. Two months later, she recovered and finally underwent surgery. Procedures included re-replacement of the aortic valve, mitral and tricuspid valve repair with annuloplasty band, single-vessel coronary artery bypass graft to the obtuse marginal branch, closure of the patent foramen ovale, left atrial appendectomy, and a radiofrequency maze procedure to hopefully reduce her postoperative atrial fibrillation.

Postoperatively, she had done remarkably well, and was quickly weaned from the ventilator and was extubated. She had delirium for several days, which cleared after narcotics were discontinued. She was in sinus rhythm initially then reverted into slow atrial fibrillation. She was discharged to home with her daughter's care on post op day six. Bernie is Teresa's daughter and she boasts that she has the all the time in the world for her mom since she has flexibility in her job. She drove her mom to health appointments and doctor's visits and delegates care to her brother when she is tied up with other personal duties.

Teresa faithfully kept all her clinic appointments and is compliant with her medications which included Warfarin, Metoprolol, Aspirin, Simvastatin, Lisinopril, Albuterol, Atrovent and Prozac. She was then referred to the cardiac rehabilitation program one month post-operatively. At first, she was hesitant to join the program because of transportation issues, however after further discussion with her daughter Bernie, Teresa decided that she needed to try the cardiac rehabilitation. At this time she was living in a senior care facility, sold her house and enjoys socializing with the other patients in the cardiac rehabilitation program. She does walk around the neighborhood most days of the week, she cooks her own meals and she would like to go back to golfing this summer of 2009.

*Suggestions for interventions/change strategies*

Teresa falls under the very elderly (>80 years old) that can expect to live 7-10 years and function independently. Secondary preventive measures including lifestyle modifications and pharmacotherapy are important for elderly patients. Exercise training in elderly patients is advocated as part of the multidisciplinary approach to secondary prevention. A standardized exercise program improves functional capacity and reduces activity-related symptoms. Despite lower absolute functional levels and smaller improvements in measures of exercise capacity, elderly patients derive significantly greater benefit in total functional scores and quality of life from increased physical activity than younger patients (Hanna & Wenger, 2005). Exercise training positively impacts CHD risk factors such as obesity, hypertension and insulin resistance even in patients older than 75 years.

In the British Regional Health study (Hanna & Wenger, 2005) which enrolled men with known CHD (mean age, 63 years), light to moderate physical activity in the form of regular walking, frequent recreational activities (e.g., gardening), or once-weekly sporting activities (e.g., jogging, swimming), was associated with a significant reduction in all cause mortality at five years of follow up. The exercise prescription should not be limited to participation in structured programs but should include occupational, leisure, and daily life activities. The program should promote all aspects of physical conditioning and encourage socialization in an effort to improve quality of life. Particular attention should be paid to the avoidance of high intensity exercises that can adversely affect the knees and shoulders. The exercise prescription should be individualized, taking into account co-morbidities that impair mobility, such as arthritis and peripheral vascular disease, and in Teresa's case, compression fracture of the spine. Increasing the frequency and duration of exercise sessions should take precedence over increasing the intensity of the activities, with the emphasis on strength training to promote independence in activities of daily living. For Teresa, being on Warfarin, it is very important that falls be prevented to avoid further trauma or worse, intracranial bleeds.

Another aspect that needs to be addressed for the elderly is psychological intervention. According to Hanna & Wenger (2005), the impact that psychological needs of elderly patients on secondary prevention of CHD has not been well defined because the recommendations mostly are derived from studies done on younger patients with CHD and elderly population with non-cardiac illness. Socioeconomic status, mood, social support, and level of functioning must be addressed. A low socioeconomic status is associated with increased CHD mortality rates, and it negatively impacts participation in cardiac rehabilitation programs. Depression and social isolation, which can affect elderly patients in part because of personal and financial losses have been associated with increased morbidity and mortality rates in older patients especially on those elderly after MI. A social worker might help in assisting the elderly and their family in this situation by performing needs assessment and community referral to social services and the like.

A routine psychosocial assessment by health care professionals using simple screening tools may identify potential issues that can be addressed with the aim of improving secondary prevention outcomes in elderly patients with CHD. Depression and social isolation are common deterrents to full cardiac recovery.

Structured cardiac rehabilitation services offer optimal setting, providing personnel trained in education and counseling. The exercise prescription is individualized, with an intensity targeting 75 percent of the patient's maximal heart rate at exercise testing (Fletcher, Balady, Froelicher, Hartley, Haskell, & Pollack, 1995). A typical session starts and ends with 10 minutes of stretching and warm up. In between, the patient performs 30 to 40 minutes of continuous aerobic activity (e.g., treadmill, walking, bicycle ergometry) and light isometric exercises. During the second phase of the program, supervised sessions are scheduled three times per week. Sternal precautions and weight restrictions for the first three months are also observed.

Finally, medication adherence of preventive medications and heart healthy nutrition is

emphasized. Paying close attention to possible side effects of medications especially in poly-pharmacy with the elderly. With the use of the daily pill box and with the help of her daughter from week to week keeps Teresa adherent with her preventive medications. Often therapeutic diets can become burdensome and overwhelming (Burke, Dunbar-Jacob, & Hill, 1997). Keeping instructions simple and individualized with the assistance of the dietician may help in diet adherence.

*Implications for nursing and potential impact for advanced practice and health policy*

Barriers that limit the participation in cardiac rehabilitation are both patient and provider oriented. The clinician deems that the patient is not eligible for the cardiac rehabilitation due to a high-risk medical condition and or an absolute contraindication to exercise or in Teresa's case it might be because of her age.

The strength of the recommendation for rehabilitation participation by the referring clinician favorably affects adherence. If the clinician believes highly of cardiac rehabilitation, patient will likely to adhere to the program. The selling points need to be communicated to the patient and family.

Health care system and or societal barriers may either include lack of cardiac rehabilitation program on site which is sometimes a deterrent to participation due to transportation issues, or lack of insurance coverage. Fortunately, Teresa is >65 years of age so Medicare pays for some of the expenses, although sometimes with \$5 to \$25, co-pays for each session for 32 sessions can be really expensive to elderly patients on fixed monthly income.

Thomas et al (2007) in the most recent AACVPR/ACC/AHA performance measures on cardiac rehabilitation listed the aim of the cardiac rehabilitation performance writing committee, which was to address two important persistent gaps in the quality of care for patients with CHD:

- a) Inadequate referral rates to cardiac rehabilitation programs (which deals with plugging in patients)

- b) the need for minimum performance standards for each program (designed to continually improve the quality of care provided to their patients with CHD).

There is no consensus among the cardiologists in the author's current work site regarding mandatory cardiac rehabilitation referral. Some cardiologists do not think that cardiac rehabilitation makes any difference despite the published evidence of its benefits. A policy must be in place for a cardiac rehabilitation service to be offered to all patients eligible for these services.

Elderly patients are more likely to have poor functional fitness, decreased muscular strength, decreased bone mineral content, limited flexibility, impaired eyesight, poor balance, isolated systolic hypertension and vascular disease and a host of other co-morbidities and health concerns. The exercise program should be modified accordingly with careful minimization of safety risks. The goals for exercise training include reducing fall risk through the development of increased strength, flexibility and balance. Participation in activities that increase socialization is recommended to combat isolation and depression in the elderly (Womack, 2003).

#### *Self-reflection on personal and professional leadership skills*

After all what Teresa had gone through to get where she is at right now with her health, (convincing and even surprising the health care team of her surgery and speedy recovery) it is the responsibility of the clinician to support Teresa wholeheartedly during the recovery period. It is also to actively make sure that the secondary prevention efforts to prevent further cardiac events are underway.

The elderly should be vigorously encouraged to attend the cardiac rehabilitation and exercise training programs starting by convincing her and her family to participate in the cardiac rehabilitation program. Therefore, primary and secondary preventive efforts directed at the elderly need further emphasis. Compliance in cardiac rehabilitation is a major problem. One strategy proven beneficial to combat noncompliance is a brief post-discharge phone call that includes education regarding the

benefits of cardiac rehabilitation and information about enrolling. The APNs can actively encourage the hospitalists in their institution to include cardiac rehabilitation in their discharge planning as well.

Another potential leadership role for the APNs is by making rehabilitation program convenient, accessible, and affordable/reimbursable by starting to get “buy-in” from business management.

Even though some persons may have significant patient/provider oriented barriers to cardiac rehabilitation referral, nearly all patients with CHD can benefit from at least some components of a comprehensive, secondary prevention program (Forman & Farquhar, 2000). If there is no formal cardiac rehabilitation on site, the APN may start by looking at his/her organizational structure and try to start doing a pilot study in the APN’s specific area and then building from there after obtaining input from key personnel for example the chief of the department and then the rest of the department.

Finally, another potential professional leadership role for the APN is to do more research in elderly population especially in women with regards to secondary CHD prevention as there are not enough available studies in these areas.

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Running Head: SECONDARY PREVENTION OF CHD

Multidisciplinary Group Clinic Visits  
In  
Secondary Prevention of Coronary Heart Disease

Independent Case Report

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## Description and Significance of the Clinical Problem

### *Describe the problem*

Patients with established coronary heart disease (CHD) have a high risk of subsequent myocardial infarction (MI), stroke, and death (Hennekens & Cannon, 2008). Comprehensive risk factor interventions extend overall survival, improve quality of life, decrease the need for interventional procedures such as angioplasty and coronary artery bypass grafting (CABG), and reduce the incidence of subsequent MIs (Thomas, King, Oldridge, Pinam, & Spertus, 2007). Despite the existence of expert consensus guidelines on cardiovascular risk reduction by the American College of Cardiology (ACC), secondary prevention therapies to decrease morbidity and mortality are underutilized (Gluckman, 2004).

There is no effective system for intensive secondary prevention of CHD in patients who have suffered cardiac events or for those patients who have undergone revascularization procedures, within the Kaiser Permanente Northwest (KPNW) region. In addition, the average hospital stay for acute coronary syndrome (ACS) has been shortened, limiting the opportunity to counsel patients about risk-reducing strategies (Gluckman, 2004).

### *Population affected by the problem*

The population affected by the problem is out patient adults (from age 18) who in the previous 12 months have had cardiac events and post coronary revascularization procedures (percutaneous intervention {PCI}, stent, angioplasty and CABG). At Kaiser Sunnyside Medical Center (a NW regional clinic and the setting for this clinical inquiry), there are approximately 30 patients a month post revascularization procedure plus the

numbers of patients who suffered MI or ACS or those who have diagnosis of CHD and stable angina.

*Epidemiology*

In 2000, the ACC estimated that the population of 12.5 million Americans with the diagnosis of CHD in that year would double in size by 2050, due to the aging population (Foote, 2000). In 2000, acute MI was diagnosed in 1.1 million Americans and approximately 850,000 patients underwent coronary revascularization procedures (Pearson, 2007). Continued case-fatality reductions would further accelerate the rise in prevalence and the implications for health care costs and for public health will be enormous (Pearson). Some of these survivors will have sequela of their disease such as disability and reduced quality of life (Pearson). Almost all will require numerous medications, increased care by medical specialists, recurrent testing; for some, recurrent hospitalization and invasive procedures (Pearson). In spite of this, studies have shown that medical therapies for secondary prevention of CHD are underutilized (Gluckman, 2004).

*Brief description of literature re: clinical problem*

Meta-analyses and systematic reviews provide and summarize the extensive evidence that has been generated from published clinical trials demonstrating that cardiac rehabilitation services (which include secondary prevention risk reduction) are beneficial for patients with established CHD. These benefits include improved processes of care and risk factor profiles that are closely linked to subsequent reduction in mortality and morbidity (Oldridge, et al., 1998; O'Connor, et al., 1989; Linden, et al., 1996; AHRQ, 2005). Pooled data from the randomized controlled trials (RCTs) of cardiac

rehabilitation demonstrate a mortality benefit of approximately 20% to 25% and a trend towards reduction of nonfatal recurrent MI over 12 months (Thomas, et al., 2007). While advances in risk factor modification have led to a decline in CHD mortality, implementation of risk reducing practices for both inpatients and outpatients remain sub optimal (Gluckman, 2004; Rogers, et al., 2000).

*Organizational and local knowledge and status of the clinical problem*

Currently Kaiser Sunnyside Medical Center (cardiology clinic), has been outsourcing cardiovascular surgical, revascularization and cardiac rehabilitation services to Providence St. Vincent Medical Center. This population of patients has several co-morbidities and risk factors, e.g., diabetes mellitus, hypertension, hyperlipidemia, smoking, and depression/anxiety. Currently, in this particular cardiology clinic, patients are followed at 2 weeks and 4 weeks post revascularization procedure by a nurse practitioner (NP) or a physician assistant (PA). However, in April 2009, all revascularization procedures will be done at the Kaiser Sunnyside Medical Center (internalization – bringing in the revascularization procedures including surgery to Kaiser Sunnyside Medical Center). There is a support for a formal secondary prevention program on site.

*Importance of the clinical problem to Advanced Practice Nurse (APNs)*

APNs possess the potential to provide leadership in facilitating program development of an alternative cost effective method of providing care to cardiac patients, such as the group clinic visits which incorporate the cardiac rehabilitation/secondary prevention guidelines as proposed here. A collaboration (especially in this timely internalization period) with various health-care providers,

(pharmacist, nutritionist, social worker) cardiology staff and administration is crucial for the organization. APNs may share their knowledge and expertise not only in their practice, but also in system-level change and policy formulation, which is important in health care innovation and program development. APNs have been identified by the regional chief of cardiology as appropriate for leading this new program.

*Desired outcomes of the project*

The desired outcomes are changes in behaviors (adherence to medications, smoking cessation, regular physical activity, diet adherence), and improvements in risk factor reduction (lipid profile, blood glucose, weight and blood pressure).

*Purpose Statement*

The purpose of this practice improvement project is to develop an effective program incorporating APN-led multidisciplinary group clinic visits using evidence-based-guidelines for secondary prevention of CHD.

*The Clinical Inquiry Questions:*

Does participation in APN-led multidisciplinary group clinic visits (8-week pilot study) result in changes in risk reduction behaviors (adherence to medications, smoking cessation, regular physical activity, diet adherence) ?

Does participation in APN-led multidisciplinary group clinic visits (8-week pilot study) result in improvements in risk factor reduction (improvements in lipid profile, blood glucose, weight and blood pressure)?

Conceptual Framework

*Description of the framework*

Health care professionals must emphasize the seriousness and long-term outcomes

of untreated heart disease (Gentz, 2000) by implementation of secondary prevention guidelines. One way to achieve this is through cardiac rehabilitation/secondary prevention group clinic visits. To influence health behaviors that decrease risks of cardiac events, patients will be invited to attend group visits at which their knowledge and skills may improve, thereby enhancing self efficacy which influence performance of healthy behaviors and increase health outcomes. Self-efficacy works by enhancing one's belief that he/she possess the necessary knowledge and skills needed to perform a specific behavior.

*See Figure. (Factors to promote secondary CHD prevention)*

*Link to purpose and clinical inquiry questions*

Self-efficacy theory will serve as the conceptual framework for this clinical inquiry. Self-efficacy promotes health outcomes by influencing health behavior and lifestyle modification in patients with CHD. Self-efficacy refers to one's self confidence to perform a behavior that will attain a desired goal (Bandura, 1982). Self-efficacy may be used clinically in the cardiac rehabilitation setting to evaluate the patient's efficacy expectations and the health care provider could then implement appropriate interventions to strengthen these expectations. This secondary prevention program will include interventions based on 4 informational sources: a) enactive attainment, which is the actual performance of a behavior; b) vicarious experience or visualizing other similar people performing the behavior; c) verbal persuasion or exhortation; d) physiological state or physiological feedback during a behavior (Bandura, 1982).

### *Conceptual Definitions*

*Self-efficacy* was defined by Albert Bandura (1977) as one's judgment of his/her capabilities to organize and execute courses of action required to attain designated types of performances. The focus is not on the skills one has but the personal judgment of what one can do with those skills (Bandura, 1982). The theory of self-efficacy is based on the belief that what people think, believe, and feel affects how they behave.

### *Review of Literature*

There are multiple studies related to managing chronic illness including patients with cardiac disease. Jenkins (1985) did a descriptive study following an MI depicting the relationships between self-efficacy expectations and behavior. This study provided some support for the impact of specific interventions to strengthen self-efficacy expectations and influence behavioral outcomes following cardiac surgery. Allen, Becker and Swank (1990) concluded in their study that self-efficacy related to performance of activities of daily living at discharge was the best predictor of 6-month functional status. Schuster and Waldron (1991) studied the impact of self-efficacy expectations on attendance in a cardiac rehabilitation program. Self-efficacy theory was used to guide the development of cardiac rehabilitation programs (Hiltunen, Wankler, Rait, Buselli, Carroll & Rankin, 2005).

Cardiovascular heart disease is the leading cause of morbidity and mortality in the United States, accounting for over 50 percent of all deaths (Thomas, et. al., 2007). CHD with its clinical manifestations of stable angina pectoris, unstable angina, acute MI, and sudden death affects 13.5 million Americans (Thomas). According to the World Health

Organization (2005), individuals with established CHD, particularly those who have survived a myocardial infarction, have high rates of recurrent vascular events and are much more likely to die in a recurrent event. The risk of major coronary events for patients with CHD is over 20% per 10 years (Third Report of the National Cholesterol Education Program (NCEP) Expert Panel, 2001). The almost 1 million survivors of myocardial infarction and the 7 million patients with stable angina pectoris are candidates for cardiac rehabilitation, as are the 309,000 patients who undergo CABG surgery and the 362,000 patients who undergo PCI each year are eligible for the cardiac rehabilitation/secondary prevention services (Gluckman, 2004).

However, patients may not access secondary prevention programs such as cardiac rehabilitation despite its association with a 20% reduction on mortality (Cooper, Cutler, & Desvigne-Niclaus, 2000). Only about 15 to 30% of acute myocardial infarction patients receive cardiac rehabilitation services (Cooper). Reasons for nonparticipation include lack of physician referral, poor patient motivation, and logistical or financial constraints (Cooper; Thomas, et al., 2007).

### *Cardiac Rehabilitation*

Recovery from an MI or cardiac surgery is often accompanied by a host of psychological and physical problems (Shumaker & Czajkowski, 1994). The consequences of a cardiac event include energy loss, recurring chest pain, dependence on others, and tension in social and sexual relationships. As patients begin to understand the ramifications of chronic heart disease and experience the emotions related to that understanding, enrollment in a structured outpatient cardiac rehabilitation program can provide them with information, guidance and support.

## Independent Case Report 9

The most difficult time period in the recovery process is the first month following discharge from the hospital. The aim of all cardiac rehabilitation programs is the return to an enjoyable and productive life for patients with heart disease. The goal for these patients is improvement in function based on relief from physical symptoms, a decrease in the severity of the illness, and a delimitation of disease progression (Shumaker & Czajkowski, 1994). Cost-effective interventions are available for secondary prevention, and the potential gains associated with the consistent use of such interventions is very large. Aspirin, beta-blockers, angiotensin converting enzyme (ACE) inhibitors and lipid lowering therapies lower the risk of future vascular events in high-risk patients by about a quarter each (Cooper, et al., 2000). The benefits of these interventions appear to be largely independent, so that when used together it is expected that two thirds to three quarters of future vascular events could be prevented (Cooper). There is a remarkable heterogeneity in prescription rates of these proven secondary prevention strategies. B-blocker rates vary by region from <20% to >80% of MI patients leaving the hospital with B-blocker prescription (Cooper). Patients with CHD infrequently receive the recommended levels of treatment for hyperlipidemia (Cooper). Clinical trials have demonstrated that lowering cholesterol levels reduces the risk of coronary death by 18-35% (Heart Protection Study, Collaborative Group, 2002). An audit of 48,586 medical records of patients with CHD in 140 practices found only 44% had an LDL cholesterol measurement and only 29% had an LDL cholesterol level of <100 mg/dl. (Cooper).

In addition to these drug therapies, if smoking cessation and aggressive blood pressure lowering are attained, it may be possible to lower the risk of future vascular

events by about four-fifths in high-risk people (WHO, 2005). Given the potential gains, making these interventions affordable and accessible to all patients with CHD could lead to substantial individual and public benefits (WHO, 2005)

Rafterty, Yao, Murchie, Guiding, Campbell, Ritchie, et al., (2005) showed the cost effectiveness of nurse led clinics and the outcome measures are the overall costs to health service and cost per life years and quality adjusted per year (QALY) gained. The conclusion was that nurse led clinics for the secondary prevention of CHD in primary care seem to be cost effective compared with most interventions in health care, with the main gains in life years saved.

Page, Lockwood, & Conroy-Hiller, (2005) did a study on patients with diagnosis of CHD. It consisted of 6 RCTs and the recommendations were that the use of nurse-led clinics is recommended for patients with CHD. The use of nurse-led clinics may increase clinic attendance and follow-up rates. Nurse-led clinics are recommended for patients who require lifestyle changes to decrease their risk of adverse outcomes associated with CHD. Campbell et al., (1998), did a RCT on secondary prevention clinics for CHD looking at the effect on health and overall improved patients' health. The greatest benefit was in functional status, improvements in chest pain, and decreased need for hospital admissions. Targeting secondary prevention in general practice population can achieve significant and important benefits to patients' health within the first year. The SPHERE Study (Secondary prevention of heart disease in general practice), is a RCT, looked at the primary outcomes: blood pressure, total cholesterol, and physical and mental health status and hospital re-admissions. A systematic review concluded that such programs do improve processes of care, reduce hospital admissions and enhance quality

of life and functional status (Murphy, Cupples, Smith, Byrne, & Leathem, 2005). There is also evidence that nurse-led clinics, cognitive behavioral interventions, and tailored training identified by practice staff are effective in improving secondary prevention in general practice and facilitating patients to make lifestyle changes (Murphy, et al., 2005).

In the KPNW region, there are Web-based national guidelines for clinicians that are available, but these are not uniformly followed. In the past, there was a Multifit program which was run by a registered nurse which focused on management and education of patients discharged from the hospital following acute coronary events. In other KP regions, group clinics are known to have benefited some organizations through more efficient management of patients with complex health problems in a reduced number of emergency room visits.

### *Summary*

Based on the extensive review of the literature, there is a need to implement new strategies and to explore different models of care (group clinic visits) to utilize the proven strategies for secondary prevention of CHD by reorganizing health care teams, use of non-physician professionals such as APNs and by applying self-efficacy in group clinic visits to achieve the cardiovascular risk reduction outcomes. There is a substantial evidence that a structured systematic care is important to improve levels of secondary prevention of CHD. Further, there is also evidence that nurse-led clinics are effective in improving secondary prevention in general practice and facilitating patients to make lifestyle changes.

The success of this worthwhile, timely, and much needed project depends on the achievement of measurable CHD secondary prevention outcomes within the 8-week pilot

program: changes in risk reduction behaviors (in adherence to medication, smoking cessation, regular physical activity and diet adherence), and improvements in risk factor reduction (improvement in lipid profile, weight, blood glucose, and blood pressure). A follow up study (beyond the 8 week pilot program) is recommended to determine if such model of care decreases morbidity and mortality, decreases frequency of hospitalizations, and provides cost-effective method of care for the KPNW region, and as such can be adapted as a model of care for the entire KP organization.

In conclusion, the APN-led multidisciplinary group clinic visits have the potential to successfully meet the national benchmarks by implementing the evidence-based practice guidelines in secondary prevention of CHD.

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Appendix:

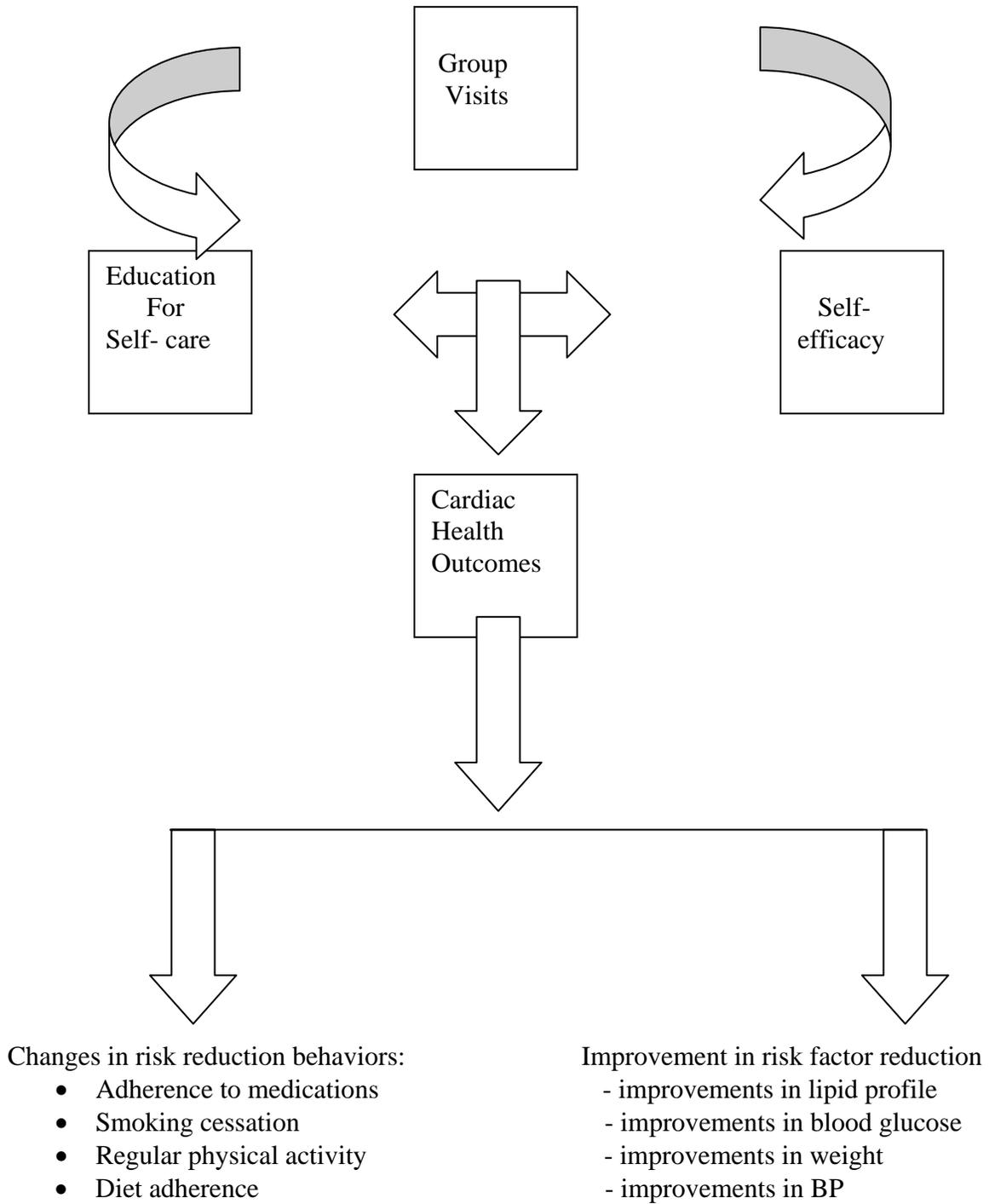


Figure 1. Factors that promote secondary prevention of CVD

Collective Evidence Table

| Synopsis  |   | Findings  |                                       | Clinical applicability                                |   |
|---|---|---|---------------------------------------|---|---|
| <i>Citation</i>                                       | <i>Clinical Question</i>  | <i>Design</i>   | <i>Credibility</i>                    | <i>Significance</i>                                   | <i>Applicability</i>  |
| Author & Year   | Hypothesis Variables under study  | Design Sample Population Would you change anything              | Rigor in data collection and analysis | Statistical & Clinical Significance Level of Evidence | Can these be applied to clinical inquiry  |
| 1. Agency for Health Care Research and Quality (2005) | Secondary prevention programs   | RCT of secondary prevention programs in Coronary Artery Disease | RCT                                   | Level of Evidence -A                                  | This can be applied to the clinical inquiry (statistics)  |
| 2. Allen, J.K., Becker, D. M., & Swanck, R.T. (1990)  | Factors related to functional status after coronary artery bypass surgery | RCT   | RCT                                   | Level of evidence B                                   | This is important in the conceptual framework for this clinical inquiry Theory of behavioral change-important for the conceptual framework Important for the conceptual framework |
| 3. Bandura, A. (1977)                                 | Self-efficacy theory  |   |                                       |   |   |
| 4. Bandura, A. (1982)                                 | Assessment and predictive generalizability of self-perception of efficacy |   |                                       |   |   |
| 5. Campbell,  | Secondary   |   | RCT                                   | Level of  | This is a   |

|  |  |  |               |                  |  |
|--|--|--|---------------|------------------|--|
| N., Thain, J., Deans, G., Ritchie, L., Mackenzie, Rawles, J., et al., (1998) | prevention clinics for secondary heart disease   |  |               | Evidence A       | basis for this clinical inquiry<br>Probably could have discussed more about group clinic visits.<br>This is aimed at the primary care practice |
| 6. Cohen S., Underwood, L., Gottlieb, B. (2000)                              | Social support measurement and intervention  |  |               | Level B          | This serves as a guide/tool for the conceptual framework geared towards the intervention   |
| 7. Cooper, R., Cutler, J., & Desvigne-Niclaus (2005)                         | Trends and disparities in coronary heart disease, stroke and other cardiovascular diseases in the US | Findings on the national conference on cardiovascular disease prevention |               | Level A evidence | This is useful for the clinical inquiry  |
| 8. Foote, D.K. (2000)  | Demographics and Cardiology, 1950-2050   |  |               |                  | This is helpful for the demographics and statistics for this clinical inquiry  |
| 9. Gentz, C. (2000)  | Perceived learning needs of the patient undergoing coronary angioplasty                              | Integrative review of literature   |               | Level B          | Useful for the Development of this clinical inquiry  |
| 10. Gluckman, T.J., (2004)   | A practical and evidence-based approach to cardiovascular  | RCT  | Meta-analysis | Level A          | Useful for the clinical inquiry – for the guidelines   |

|  |   |                                   |               |                  |  |
|--|---|-----------------------------------|---------------|------------------|--|
|  | disease risk reduction  |                                   |               |                  | review   |
| 11. Heart Protection Study Collaborative Group (2002)  | A study of cholesterol lowering with simvastatin in high risk individuals | RCT placebo-controlled trial      |               | Level A evidence | Useful guide for the clinical inquiry  |
| 12. Hennekens, C., & Cannon, C. (2008)   | Secondary prevention of cardiovascular disease, risk factor and reduction | RCT                               |               |                  | Useful guide for the clinical inquiry  |
| 13. Hiltunen, E. F., Winkler, P.A., Rait, M.A., Buselli, E.F., Carroll, D. L., & Rankin, S. H., (2005) | Implementation of efficacy enhancement with cardiac elders.               |                                   |               | Level B evidence | This deals with different population and offers strategies to use  |
| 14. Jenkins, L. (1985)   | Self-efficacy in recovery from myocardial infarction                      | Unpublished doctoral dissertation | descriptive   |                  | Good tool for cardiac rehab  |
| 15. Linden, W., Stossel, C., Maurice, J. (1996)  | Psychosocial interventions for patients with coronary artery disease      | RCT                               | Meta-analysis | Level B evidence | Good tool for cardiac rehab  |
| 16. Murphy, A., Cupples, M., Smith, S., Byrne, M., & Leatherm, C., (2005)                              | Secondary prevention of heart disease in general practice                 | RTC                               |               | Level B evidence | Offers a tailored practice and patient care plans with parallel qualitative economic and policy analyses |
| 17. O'Connor, G. T.,   | Rehabilitation and exercise after   | RCT                               |               | Level B evidence | Useful tool for the cardiac rehab  |

|  |  |                                   |   |                     |  |
|--|--|-----------------------------------|---|---------------------|--|
| Buring, J.E.,<br>& Yusuf, S.<br>(1989)                           | myocardial<br>infarction   |                                   |   |                     | portion of the<br>clinical<br>inquiry  |
| 18. Oldridge,<br>N.B., et al.,<br>(1998)                         | Cardiac<br>Rehabilitation<br>after<br>myocardial<br>infarction   | Combined<br>experience<br>and RCT |   | Level A<br>evidence | This provides<br>a good<br>guideline for<br>the rehab<br>portion of the<br>clinical<br>inquiry |
| 19. Page, T.<br>Lockwood,<br>C., Conroy-<br>Hiller, T.<br>(2005) | Effectiveness<br>of nurse-led<br>cardiac clinic<br>in adult<br>patients with a<br>diagnosis of<br>coronary heart<br>disease. | RCT                               | Groups<br>should<br>have been<br>discussed<br>further |                     | Very useful<br>for the<br>intervention<br>during<br>clinical<br>inquiry                        |
| 20. Pearson,<br>T. (2007)  | The prevention<br>of<br>cardiovascular<br>disease: Have<br>we really made<br>progress?                                       | descriptive                       |   |                     | Good<br>background<br>during the<br>preliminary<br>process of the<br>inquiry                   |
| 21. Rafferty,<br>Yao,<br>22.Murchie,<br>et al., (2005)           | Cost<br>effectiveness of<br>nurse led<br>secondary<br>prevention<br>clinics for<br>CHD in<br>primary care                    | RCT                               |   | Level A<br>evidence | Very useful<br>for the<br>clinical<br>inquiry<br>during the<br>intervention<br>portion         |

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|  |  |  |  |                  |   |
|--|--|--|--|------------------|---|
| 23. Resnick, B. (2009)   | Self-efficacy theory. Middle Range Theories: Applications to Nursing Research  |  |  |                  | Good review for the conceptual framework  |
| 24. Rogers, E., et. al., (2000)  | Temporal needs in the treatment of over 1.5 million patients with myocardial infarction in the U.S., from 1990-1999                                      | National registry of myocardial infarction |  |                  | Useful for demographics and statistics part of the clinical inquiry   |
| 25. Shuster, P. & Waldron, J., (1991)  | Gender differences in cardiac rehabilitation patients  | descriptive                                |  |                  | Good information  |
| 26. Scott, D., Conner, D., Venohr, I., Gade, G., McKenzie, M, Kramer, A., et al., (2004) | Effectiveness of a group outpatient visit model for chronically ill older-health maintenance organization members  | RCT  |  |                  | This is a very helpful guide for this clinical inquiry as it deals with group clinic visits in an HMO setting |
|  |  |  |  |                  |   |
| 27. Schumaker, S. & Czajkowski, N., (1994)   | Social support and cardiovascular disease  |  |  |                  | Good for the conceptual framework review  |
| 28. Third Report of the National Cholesterol Education Expert Panel (2001b).             | Expert panel on detection, evaluation and treatment of High blood cholesterol in Adults  |  |  | Level A evidence | Good information and support for the clinical inquiry   |
| 29. Thomas, R., King, M., Oldridge, N., Pinam, L., & Spertus, J. (2007).                 | AACVR/ACC/AHA, 2007. Performance measures on cardiac rehabilitation for referral to and delivery of cardiac rehabilitation/secondary prevention services |  |  | Level A evidence | Very good guidelines for this clinical inquiry project  |

Running Head: GROUP VISITS - DNP LEADERSHIP CASE REPORT

Advanced Practice Nurse-Led Multidisciplinary Group Clinic Visits

In

Secondary Prevention of Coronary Heart Disease

DNP Leadership Case Report

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## Advanced Practice Nurse-Led Multidisciplinary Group Clinic Visits in Secondary Prevention of Coronary Heart Disease

### *Abstract*

One of the competencies for the doctor of nursing practice (DNP) degree is to develop a practice change innovation such as an intervention that aims to influence population or individual health outcomes for individuals or population in an advanced practice nurse's (APN) specialty. This case report presents a pilot APN-led multidisciplinary group clinic visits for secondary prevention of coronary heart disease (CHD) intervention. The implementation and evaluation of the pilot program incorporated key qualities of successful practice change innovation: effective team leadership, collaboration with other health care professionals, application of evidence based practice and understanding of organizational climate. The pilot study was guided by a transformational leadership framework. Primary outcomes were feasibility and acceptability. Secondary aims were to determine if participation in the group visits was associated with changes in risk reduction behaviors or risk factor outcomes. The main finding of this pilot study is that the APN-led multidisciplinary group clinic visit program is feasible and acceptable to those patients who chose to participate. Participants would like this program to continue and expressed appreciation of the service. The multidisciplinary team's enthusiasm contributed to high quality provider performance during the group visit sessions and participants' satisfaction with the service.

**Keywords:** transformational leadership, coronary heart disease, group clinic visits, evidence-based practice

Among the standard competencies of a doctor of nursing practice (DNP) is to develop a practice change innovation that influences individual or population-level health outcomes in an advanced practice nurse's (APN) specialty area (AACN, 2006). Effective team leadership, collaboration with other health care professionals, application of evidence based practice, and an understanding of organizational climate are among the qualities that a DNP must possess in successful innovation. (AACN, 2006). This case presents an example of how a nurse practitioner applied the DNP leadership principles in the implementation and evaluation of a pilot practice change innovation project. The pilot incorporated and applied evidence-based practice (EBP), collaborative management of a multidisciplinary team, and an understanding of the organizational climate. This article focuses on the DNP leadership qualities necessary to implement a practice change innovation with the potential to improve secondary prevention of coronary heart disease (CHD) among cardiology patients. This paper will briefly review secondary prevention of CHD, present the pilot study setting and findings then turn to a discussion of the role of APN leadership in this project.

### *Background and significance*

Patients with a history of CHD have a high risk of subsequent myocardial infarction (MI), stroke and death (Hennekens & Cannon, 2008). Implementing evidence-based guidelines (Murphy, et al. 2005) for comprehensive secondary prevention of CHD [including cardiac rehabilitation] can reduce the incidence of subsequent MIs and improve quality of life (Thomas, King, Oldridge, Pinam & Spertus, 2007). However, secondary prevention therapies to decrease mortality and morbidity are underutilized (Gluckman, 2004). The goal of secondary prevention (including cardiac rehabilitation) is to improve functioning and provide information, guidance and support. Secondary prevention is especially helpful during the first month after a cardiac event or a revascularization procedure which has been shown to be the most difficult period during the entire recovery period (Shumaker & Czakowski, 1994). Shumaker and Czakowski

further stated that recovery from a myocardial infarction or cardiac surgery is often accompanied by a host of psychological and physical problems including loss of energy, recurring chest pain, dependence on others and tension in social relationships. Despite a well documented 20% reduction in mortality among patients participating in either secondary prevention program or cardiac rehabilitation program compared to patients who do not participate, (Cooper, Cutler, & Desvigne-Niclaus, 2005), there are barriers to cardiac rehabilitation referral and to patient's participation. Reasons for nonparticipation include lack of physician referral, poor patient motivation and logistical or financial constraints (Cooper, et al; Thomas, et al., 2007). In addition, the average hospital stay for acute coronary syndrome (ACS) has been shortened, which complicates the provision of secondary prevention by limiting the opportunity to counsel these patients.

#### *Pilot study setting and findings*

There is no formal secondary prevention program for coronary heart disease in this nurse practitioner's (NP) institution. Cardiac rehabilitation and revascularization procedures such as coronary artery bypass graft surgery (CABG) and percutaneous intervention (PCI) are currently referred out to other institutions. However, there was a plan in place to internalize (offer the services on site) revascularization procedure at this institution, providing a unique opportunity to pilot an on-site secondary prevention program. Currently, CHD patients who underwent revascularization procedures or who were discharged after an acute coronary syndrome (ACS) or myocardial infarction (MI) without revascularization (treated medically) are seen in follow up by NPs and physician assistants (PA) two weeks after hospital discharge. These patients are seen in traditional one-on-one follow up visits. This pilot study was conducted to determine if group visits are feasible and acceptable to CHD patients. This APN-led multidisciplinary group clinic visits are based on evidence-based guidelines for secondary prevention of CHD and are an innovative model for the secondary prevention of

CHD.

The multidisciplinary team includes the NP, clinical pharmacist, social worker and dietician. A group clinic visit is a scheduled visit for a group of patients with common health problems or concerns. The group visits provide an opportunity to integrate clinical services, education and group support. The APN's project satisfies one of the competencies for the DNP which is to develop a practice innovation that influences health care outcomes for the NP's area of specialty, cardiology.

The aims of this pilot study were: (1) to determine the feasibility and acceptability of APN-led multidisciplinary group clinic visits in secondary prevention of CHD in this practice setting, (2) to assess changes in risk reduction behaviors (medication adherence [ASA, statin, ACEI, beta-blocker if appropriate], smoking cessation, regular physical activity and diet adherence), and (3) to assess changes in risk factor outcomes (improvements in LDL cholesterol, blood glucose, weight and blood pressure).

The main finding of this pilot study is that the APN-led multidisciplinary group clinic visit program is feasible and acceptable to those patients who chose to participate. Participants would like this program to continue and expressed appreciation of the service. Participants also offered suggestions for future group visits especially around logistical and scheduling issues to improve access and participation and feedback to improve our measurement tools especially for the diet adherence instrument. The multidisciplinary team's enthusiasm contributed to high quality provider performance during the group visit sessions and participants' satisfaction with the service.

We documented significant changes in pre- and post-group visit participation self reported physical activity and blood glucose, despite our small sample size. In addition, incremental improvements in LDL cholesterol were noted. No clinically significant changes in weight and blood pressure were noted. The next sections focus on NP leadership in

implementing the pilot secondary prevention project.

*Context for decision-making*

Health care organizations in the 21<sup>st</sup> century face challenges in meeting the performance expectations of critical stakeholders, consumers, payers and regulators (Wells & Hejna, 2009). Challenges in today's health care delivery environment include limited reimbursements, reduced operating margins, shortages of health care professionals, burdensome requirements to document performance and safety indicators and increased scrutiny by the public and by the government (Stefl, 2008). Stefl further stated that "today's health care executives and leaders not only must have management talents tailored to match the increased complexity of healthcare environment but also to demonstrate measurable outcomes and effectiveness to practice evidence-based management". Evidence-based practice requires translating research findings into practical use (Van Patter Gale & Schaffner, 2008). In this particular institution, the mission is to provide high quality, cost effective and evidence-based care to patients. APNs are well positioned to provide leadership in facilitating practice innovation to meet the institutional mission. Collaboration (especially during the internalization period) with health-care and allied professionals (clinical pharmacist, dietician, and social worker), the cardiology staff and the administration is crucial in this institution to meet its mission. APNs may share their knowledge and expertise not only in their own practice, but also in system-level change and policy formulation, which is important in health care innovation and program development. APNs have been identified by the regional chief of cardiology as appropriate for leading this new program at this institution.

Innovation in this particular cardiology clinic includes researching new ways to provide patient care (i.e. group instead of the traditional instead of individual clinic visits), supporting an environment of empowerment of multidisciplinary staff, and evaluating and sustaining change. Our chief of cardiology is supportive of innovation. Hill (2009) suggests that "in order to

inspire and lead change, it is important to surround oneself with talented people by identifying talent, seeking out leaders who will support the innovation change and supporting these individuals as they go about doing the work to create, a vision, and working collaboratively with other departments”. The NP started with a vision by identifying the issue or problem, possible solution, then discussing with the regional chief of cardiology to seek guidance and support. Support from leadership and collaboration with other providers was crucial to our goal: the development of an alternative method of providing care to cardiac patients, such as group clinic visits which incorporate evidence-based guidelines and may be cost-effective if successful at preventing subsequent service utilization for CHD events.

The implementation of the pilot program was guided by key principles in the organizational change literature. Changing organizational culture around a practice requires that the change is consistent with the organizational philosophy and political agenda and that resources are available to support the change (Van Patter Gale & Schaffner, 2009). The organizational philosophy of this particular institution is to deliver high quality, safe health care services to patients. The political agenda during the pilot study included the internalization project. There was a sense of urgency in this project due to the timeline of the internalization project which contributed to the successful launch of the pilot program. Successful organizational change also depends heavily on effective leadership.

### *Leadership*

Leadership is the ability to inspire individual and organizational excellence to create and attain a shared vision and to successfully manage change to attain the organization’s strategic ends and successful performance (Stefl, 2008). Kirby and Robertson (2009) discuss business intelligence in leaders of innovation and suggest that health care organizations start small, align organizationally, and leverage success. Clear targets and transparent factual data can facilitate achievement of goals, and desired outcomes. A clear purpose, starting with a manageable scale

and using feedback to retool strategy is also crucial to the success of the program. If you do not know where you are going, you cannot create the appropriate measures to tell you that you have arrived. The best leaders tend to view all issues as strategic (Waymack, 2008). During our multidisciplinary meetings, we made sure that we reviewed our goals and desired outcomes and constantly used feedback to retool our strategies.

### *Leadership qualities*

A dedicated project lead person (change agent of champion) is important to a successful implementation of a practice change innovation. Having knowledge of change process, the barriers and drivers to practice change in the work setting is also important to a successful implementation (Van Patter Gale & Schaffner, 2009). It is important to have the knowledge of the institution's layers of management including the chain of command and their respective responsibilities.

Van Patter Gale & Schaffner (2009) also discuss the characteristics that a champion needs to possess: drive, a positive enthusiastic approach, knowledge of the project, good communication skills and status to lend the person and thus the innovation, credibility in the eyes of the medical staff. Champions occupy a key relationship with staff, possess the ability to analyze the staff's abilities and must have good interpersonal and negotiation skills.

Communication and relationship management – the ability to communicate clearly and concisely, establish and maintain relationships, and to facilitate constructive interactions with individuals and groups – are key qualities of a leader (Stefl, 2008). Professionalism – the ability to align personal and organizational conduct with ethical and professional standards that include responsibility to the patient and community, and knowledge of the health care environment are also central to leadership (Stefl, 2008).

According to Kirby & Robertson (2009), organizational alignment means to execute impeccably. A typical hospital institution has multitude of disparate data sources, competing

priorities and limited resources. “Match the data with the strategy, determine the appropriate measures”. No need to “reinvent the wheel” - select the best practice metrics (various governmental agencies, clinical initiatives, benchmarking organizations (Kirby & Robertson, 2009). The key to this entire process is to get the right information into the right hands at the right time, determine the root cause of the problem, what is it that we want changed or improved? The change process goes through a series of phases. Skipping steps creates only the illusion of speed and never produces satisfying results. Critical mistakes in any of the phases can have a devastating impact, slowing momentum and negating hard-won gains (Kotter, 1995).

#### *Transformational Leadership framework*

Transformational leadership has been conceptualized as leadership targeted at change and innovation (Eissenbeiss, Knippenverg, & Boerner, 2008). Eissenbeiss et al., proposed a theoretical model in which the effect of transformational leadership on team innovation is mediated by support for innovation and moderated by climate of excellence. “Transformational leaders do not settle for current states but display unconventional and creative behavior and serve as role models for innovation”. Transformational leadership enhances supportive behavior among team members by sharing a concern for high quality performance. As teams with a “high level of climate for excellence” are willing to work harder and to the maximum of their ability, they are more likely to overcome obstacles during the implementation process in order to transform selected ideas into sizeable improvements in practice. Key concepts in transformational leadership (Wolf, Hayden, & Bradie, 2004) are vision, leadership, organizational culture, performance improvement systems, information system and resources.

#### *Self-reflection*

In our institution, the primary care department has implemented diabetes group clinics, the neurology department is currently providing headache group clinic visits and there is a group visit on pain management in this region, which proved to be successful and is ongoing.

Clinicians and managers alike have thoughts on how we can provide excellent care to a group of patients cost effectively. For several years, there had been plans establish group visits in this particular cardiology clinic. These plans included starting atrial fibrillation group clinics and group visits for patients undergoing electrophysiology procedures however, there had been no discussion about secondary prevention. Group visit plans in the cardiology department all stopped at the beginning stage. They were not piloted or implemented due to logistic, scheduling and resource challenges. These were good plans with the potential to produce positive patient outcomes, but were not made a priority.

The question for the DNP student was what went wrong or why these previous plans reached a standstill? In this particular scenario, what was needed for the DNP student to be able to overcome the obstacles of going beyond the planning stages and implement the group visits? Upon reflection, the successful implementation of the group visits can be explained by three key factors: (1) The DNP student was able to integrate the material from course work and experience as a cardiology APN to apply principles of leadership and advance her DNP competencies; (2) There was tremendous support from the chief of cardiology of this region; she is among the transformational leaders in our institution due to her unconventional and creative management style; (3) The timing of pilot also came at an opportune time during the internalization project, which was linked to a sense of urgency and strong institutional support for the secondary prevention of CHD group visit program.

The DNP competencies (Council for Advancement of Comprehensive Care DNP competencies, 2006) addressed by this project are to provide leadership in (1) practice innovation that influence health care outcomes for individuals and population in the area of specialty and (2) in establishing and utilizing a collaborative interdisciplinary network to provide optimum patient care in accordance with ethical and professional standards.

The initial step for this DNP student was to identify a problem for clinical inquiry. There

was no secondary prevention program in existence and evidence-based secondary prevention guidelines appeared to be underutilized in this cardiology department. The next step was to gather relevant data and identify available resources. Developing an understanding of the local and regional health care systems, including the social, political and cultural climate and layers of management of the organization was part of this data gathering phase.

Another important element of the data gathering was to understand what had come before; there was no need to reinvent the wheel. The DNP student interviewed people involved in practice change innovation and learned about existing successful programs in other regions and their strengths and limitations. Next the DNP student assessed whether existing program models could be applied to the population, medical department and institution in question. Goal-setting was an important next step: short and long term goals were made explicit. The multidisciplinary team group visit model was articulated as the program goal. Leadership skills such as professionalism and communication were applied in evaluating and recruiting potential dependable, trustworthy and competent multidisciplinary team members. The DNP student's role in leading and directing the multidisciplinary team was greatly facilitated by the high level of enthusiasm among team members for the group visits. This enthusiasm also translated into high quality team performance in carrying out the group visits, which then affected participants' satisfaction with the program and overall success of the pilot program. The challenge was how to temper their enthusiasm through effective communication skills and sensitivity. Different leaders and managers within the institution and in different regions were interviewed by the DNP student; these data provided insights on different leadership styles and clarified barriers and drivers of change.

Effective communication was important in every aspect of this program, from facilitating the success of the multidisciplinary team and staff by matching their abilities to the work, to carrying out the larger institutional mission to provide safe, quality care to patients. Effective

communication is also crucial when negotiating with hospital business managers to advocate for the group visit program.

#### *Future work*

The DNP student's next challenge is to build a business proposal that makes the case for the sustainability of the secondary prevention of CHD group visit program. Another important next step is to incorporate participant feedback to improve the program (e.g. scheduling and logistics) – this iterative approach is key to effective leadership, as discussed above. There are many opportunities to expand leadership roles for DNPs. A DNP could work to facilitate the work of other APNs to develop similar programs in other areas of cardiology, such as atrial fibrillation, congestive heart failure, and patients with pacemakers. Another potential DNP role is to influence local policies around referral for secondary prevention. A DNP could work with hospitalists and primary care providers to refer patients to secondary prevention programs and increase utilization of this important service. The potential cost-effectiveness of secondary prevention group visits deserves scrutiny; a DNP could design and conduct a cost-effectiveness analysis using clinical data. Promoting CHD prevention in the community might be other options for future projects for the DNP. This DNP student also noted areas of personal improvement resulting from participation in this project. This experience conferred enhanced assertiveness and negotiation skills in dealings with barriers and influencing the drivers of change within the institution. In addition, the DNP student had the opportunity to improve motivational skills to facilitate patient lifestyle changes. Finally, dissemination of this project via peer-reviewed journals, conferences and word of mouth could provide an example and encourage other APNs to grow in their areas of specialty.

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The manuscript should conform to the “Uniform Requirements for Manuscripts Submitted to Biomedical Journals: Writing and Editing for Biomedical Publication” in matters of style and formatting, including the text, references, tables. (Visit <http://www.icmje.org>) Digital files for any figure should conform to tiff at 300 ppi or eps. Please include written permission for previously published materials. A brief abstract (no more than 200 words) should accompany the manuscript.

Authors should supply a list of four keywords describing the scientific content of the article and which should be used for indexing in bibliographic databases.

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Running Head: GROUP VISITS - DNP LEADERSHIP CASE REPORT

Advanced Practice Nurse-Led Multidisciplinary Group Clinic Visits

In

Secondary Prevention of Coronary Heart Disease

DNP Leadership Case Report

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## Advanced Practice Nurse-Led Multidisciplinary Group Clinic Visits in Secondary Prevention of Coronary Heart Disease

### *Abstract*

One of the competencies for the doctor of nursing practice (DNP) degree is to develop a practice change innovation such as an intervention that aims to influence population or individual health outcomes for individuals or population in an advanced practice nurse's (APN) specialty. This case report presents a pilot APN-led multidisciplinary group clinic visits for secondary prevention of coronary heart disease (CHD) intervention. The implementation and evaluation of the pilot program incorporated key qualities of successful practice change innovation: effective team leadership, collaboration with other health care professionals, application of evidence based practice and understanding of organizational climate. The pilot study was guided by a transformational leadership framework. Primary outcomes were feasibility and acceptability. Secondary aims were to determine if participation in the group visits was associated with changes in risk reduction behaviors or risk factor outcomes. The main finding of this pilot study is that the APN-led multidisciplinary group clinic visit program is feasible and acceptable to those patients who chose to participate. Participants would like this program to continue and expressed appreciation of the service. The multidisciplinary team's enthusiasm contributed to high quality provider performance during the group visit sessions and participants' satisfaction with the service.

**Keywords:** transformational leadership, coronary heart disease, group clinic visits, evidence-based practice

Among the standard competencies of a doctor of nursing practice (DNP) is to develop a practice change innovation that influences individual or population-level health outcomes in an advanced practice nurse's (APN) specialty area (AACN, 2006). Effective team leadership, collaboration with other health care professionals, application of evidence based practice, and an understanding of organizational climate are among the qualities that a DNP must possess in successful innovation. (AACN, 2006). This case presents an example of how a nurse practitioner applied the DNP leadership principles in the implementation and evaluation of a pilot practice change innovation project. The pilot incorporated and applied evidence-based practice (EBP), collaborative management of a multidisciplinary team, and an understanding of the organizational climate. This article focuses on the DNP leadership qualities necessary to implement a practice change innovation with the potential to improve secondary prevention of coronary heart disease (CHD) among cardiology patients. This paper will briefly review secondary prevention of CHD, present the pilot study setting and findings then turn to a discussion of the role of APN leadership in this project.

### *Background and significance*

Patients with a history of CHD have a high risk of subsequent myocardial infarction (MI), stroke and death (Hennekens & Cannon, 2008). Implementing evidence-based guidelines (Murphy, et al. 2005) for comprehensive secondary prevention of CHD [including cardiac rehabilitation] can reduce the incidence of subsequent MIs and improve quality of life (Thomas, King, Oldridge, Pinam & Spertus, 2007). However, secondary prevention therapies to decrease mortality and morbidity are underutilized (Gluckman, 2004). The goal of secondary prevention (including cardiac rehabilitation) is to improve functioning and provide information, guidance and support. Secondary prevention is especially helpful during the first month after a cardiac event or a revascularization procedure which has been shown to be the most difficult period during the entire recovery period (Shumaker & Czakowski, 1994). Shumaker and Czakowski

further stated that recovery from a myocardial infarction or cardiac surgery is often accompanied by a host of psychological and physical problems including loss of energy, recurring chest pain, dependence on others and tension in social relationships. Despite a well documented 20% reduction in mortality among patients participating in either secondary prevention program or cardiac rehabilitation program compared to patients who do not participate, (Cooper, Cutler, & Desvigne-Niclaus, 2005), there are barriers to cardiac rehabilitation referral and to patient's participation. Reasons for nonparticipation include lack of physician referral, poor patient motivation and logistical or financial constraints (Cooper, et al; Thomas, et al., 2007). In addition, the average hospital stay for acute coronary syndrome (ACS) has been shortened, which complicates the provision of secondary prevention by limiting the opportunity to counsel these patients.

#### *Pilot study setting and findings*

There is no formal secondary prevention program for coronary heart disease in this nurse practitioner's (NP) institution. Cardiac rehabilitation and revascularization procedures such as coronary artery bypass graft surgery (CABG) and percutaneous intervention (PCI) are currently referred out to other institutions. However, there was a plan in place to internalize (offer the services on site) revascularization procedure at this institution, providing a unique opportunity to pilot an on-site secondary prevention program. Currently, CHD patients who underwent revascularization procedures or who were discharged after an acute coronary syndrome (ACS) or myocardial infarction (MI) without revascularization (treated medically) are seen in follow up by NPs and physician assistants (PA) two weeks after hospital discharge. These patients are seen in traditional one-on-one follow up visits. This pilot study was conducted to determine if group visits are feasible and acceptable to CHD patients. This APN-led multidisciplinary group clinic visits are based on evidence-based guidelines for secondary prevention of CHD and are an innovative model for the secondary prevention of

CHD.

The multidisciplinary team includes the NP, clinical pharmacist, social worker and dietician. A group clinic visit is a scheduled visit for a group of patients with common health problems or concerns. The group visits provide an opportunity to integrate clinical services, education and group support. The APN's project satisfies one of the competencies for the DNP which is to develop a practice innovation that influences health care outcomes for the NP's area of specialty, cardiology.

The aims of this pilot study were: (1) to determine the feasibility and acceptability of APN-led multidisciplinary group clinic visits in secondary prevention of CHD in this practice setting, (2) to assess changes in risk reduction behaviors (medication adherence [ASA, statin, ACEI, beta-blocker if appropriate], smoking cessation, regular physical activity and diet adherence), and (3) to assess changes in risk factor outcomes (improvements in LDL cholesterol, blood glucose, weight and blood pressure).

The main finding of this pilot study is that the APN-led multidisciplinary group clinic visit program is feasible and acceptable to those patients who chose to participate. Participants would like this program to continue and expressed appreciation of the service. Participants also offered suggestions for future group visits especially around logistical and scheduling issues to improve access and participation and feedback to improve our measurement tools especially for the diet adherence instrument. The multidisciplinary team's enthusiasm contributed to high quality provider performance during the group visit sessions and participants' satisfaction with the service.

We documented significant changes in pre- and post-group visit participation self reported physical activity and blood glucose, despite our small sample size. In addition, incremental improvements in LDL cholesterol were noted. No clinically significant changes in weight and blood pressure were noted. The next sections focus on NP leadership in

implementing the pilot secondary prevention project.

*Context for decision-making*

Health care organizations in the 21<sup>st</sup> century face challenges in meeting the performance expectations of critical stakeholders, consumers, payers and regulators (Wells & Hejna, 2009). Challenges in today's health care delivery environment include limited reimbursements, reduced operating margins, shortages of health care professionals, burdensome requirements to document performance and safety indicators and increased scrutiny by the public and by the government (Stefl, 2008). Stefl further stated that "today's health care executives and leaders not only must have management talents tailored to match the increased complexity of healthcare environment but also to demonstrate measurable outcomes and effectiveness to practice evidence-based management". Evidence-based practice requires translating research findings into practical use (Van Patter Gale & Schaffner, 2008). In this particular institution, the mission is to provide high quality, cost effective and evidence-based care to patients. APNs are well positioned to provide leadership in facilitating practice innovation to meet the institutional mission. Collaboration (especially during the internalization period) with health-care and allied professionals (clinical pharmacist, dietician, and social worker), the cardiology staff and the administration is crucial in this institution to meet its mission. APNs may share their knowledge and expertise not only in their own practice, but also in system-level change and policy formulation, which is important in health care innovation and program development. APNs have been identified by the regional chief of cardiology as appropriate for leading this new program at this institution.

Innovation in this particular cardiology clinic includes researching new ways to provide patient care (i.e. group instead of the traditional instead of individual clinic visits), supporting an environment of empowerment of multidisciplinary staff, and evaluating and sustaining change. Our chief of cardiology is supportive of innovation. Hill (2009) suggests that "in order to

inspire and lead change, it is important to surround oneself with talented people by identifying talent, seeking out leaders who will support the innovation change and supporting these individuals as they go about doing the work to create, a vision, and working collaboratively with other departments”. The NP started with a vision by identifying the issue or problem, possible solution, then discussing with the regional chief of cardiology to seek guidance and support. Support from leadership and collaboration with other providers was crucial to our goal: the development of an alternative method of providing care to cardiac patients, such as group clinic visits which incorporate evidence-based guidelines and may be cost-effective if successful at preventing subsequent service utilization for CHD events.

The implementation of the pilot program was guided by key principles in the organizational change literature. Changing organizational culture around a practice requires that the change is consistent with the organizational philosophy and political agenda and that resources are available to support the change (Van Patter Gale & Schaffner, 2009). The organizational philosophy of this particular institution is to deliver high quality, safe health care services to patients. The political agenda during the pilot study included the internalization project. There was a sense of urgency in this project due to the timeline of the internalization project which contributed to the successful launch of the pilot program. Successful organizational change also depends heavily on effective leadership.

### *Leadership*

Leadership is the ability to inspire individual and organizational excellence to create and attain a shared vision and to successfully manage change to attain the organization’s strategic ends and successful performance (Stefl, 2008). Kirby and Robertson (2009) discuss business intelligence in leaders of innovation and suggest that health care organizations start small, align organizationally, and leverage success. Clear targets and transparent factual data can facilitate achievement of goals, and desired outcomes. A clear purpose, starting with a manageable scale

and using feedback to retool strategy is also crucial to the success of the program. If you do not know where you are going, you cannot create the appropriate measures to tell you that you have arrived. The best leaders tend to view all issues as strategic (Waymack, 2008). During our multidisciplinary meetings, we made sure that we reviewed our goals and desired outcomes and constantly used feedback to retool our strategies.

### *Leadership qualities*

A dedicated project lead person (change agent of champion) is important to a successful implementation of a practice change innovation. Having knowledge of change process, the barriers and drivers to practice change in the work setting is also important to a successful implementation (Van Patter Gale & Schaffner, 2009). It is important to have the knowledge of the institution's layers of management including the chain of command and their respective responsibilities.

Van Patter Gale & Schaffner (2009) also discuss the characteristics that a champion needs to possess: drive, a positive enthusiastic approach, knowledge of the project, good communication skills and status to lend the person and thus the innovation, credibility in the eyes of the medical staff. Champions occupy a key relationship with staff, possess the ability to analyze the staff's abilities and must have good interpersonal and negotiation skills.

Communication and relationship management – the ability to communicate clearly and concisely, establish and maintain relationships, and to facilitate constructive interactions with individuals and groups – are key qualities of a leader (Stefl, 2008). Professionalism – the ability to align personal and organizational conduct with ethical and professional standards that include responsibility to the patient and community, and knowledge of the health care environment are also central to leadership (Stefl, 2008).

According to Kirby & Robertson (2009), organizational alignment means to execute impeccably. A typical hospital institution has multitude of disparate data sources, competing

priorities and limited resources. “Match the data with the strategy, determine the appropriate measures”. No need to “reinvent the wheel” - select the best practice metrics (various governmental agencies, clinical initiatives, benchmarking organizations (Kirby & Robertson, 2009). The key to this entire process is to get the right information into the right hands at the right time, determine the root cause of the problem, what is it that we want changed or improved? The change process goes through a series of phases. Skipping steps creates only the illusion of speed and never produces satisfying results. Critical mistakes in any of the phases can have a devastating impact, slowing momentum and negating hard-won gains (Kotter, 1995).

#### *Transformational Leadership framework*

Transformational leadership has been conceptualized as leadership targeted at change and innovation (Eissenbeiss, Knippenverg, & Boerner, 2008). Eissenbeiss et al., proposed a theoretical model in which the effect of transformational leadership on team innovation is mediated by support for innovation and moderated by climate of excellence. “Transformational leaders do not settle for current states but display unconventional and creative behavior and serve as role models for innovation”. Transformational leadership enhances supportive behavior among team members by sharing a concern for high quality performance. As teams with a “high level of climate for excellence” are willing to work harder and to the maximum of their ability, they are more likely to overcome obstacles during the implementation process in order to transform selected ideas into sizeable improvements in practice. Key concepts in transformational leadership (Wolf, Hayden, & Bradie, 2004) are vision, leadership, organizational culture, performance improvement systems, information system and resources.

#### *Self-reflection*

In our institution, the primary care department has implemented diabetes group clinics, the neurology department is currently providing headache group clinic visits and there is a group visit on pain management in this region, which proved to be successful and is ongoing.

Clinicians and managers alike have thoughts on how we can provide excellent care to a group of patients cost effectively. For several years, there had been plans establish group visits in this particular cardiology clinic. These plans included starting atrial fibrillation group clinics and group visits for patients undergoing electrophysiology procedures however, there had been no discussion about secondary prevention. Group visit plans in the cardiology department all stopped at the beginning stage. They were not piloted or implemented due to logistic, scheduling and resource challenges. These were good plans with the potential to produce positive patient outcomes, but were not made a priority.

The question for the DNP student was what went wrong or why these previous plans reached a standstill? In this particular scenario, what was needed for the DNP student to be able to overcome the obstacles of going beyond the planning stages and implement the group visits? Upon reflection, the successful implementation of the group visits can be explained by three key factors: (1) The DNP student was able to integrate the material from course work and experience as a cardiology APN to apply principles of leadership and advance her DNP competencies; (2) There was tremendous support from the chief of cardiology of this region; she is among the transformational leaders in our institution due to her unconventional and creative management style; (3) The timing of pilot also came at an opportune time during the internalization project, which was linked to a sense of urgency and strong institutional support for the secondary prevention of CHD group visit program.

The DNP competencies (Council for Advancement of Comprehensive Care DNP competencies, 2006) addressed by this project are to provide leadership in (1) practice innovation that influence health care outcomes for individuals and population in the area of specialty and (2) in establishing and utilizing a collaborative interdisciplinary network to provide optimum patient care in accordance with ethical and professional standards.

The initial step for this DNP student was to identify a problem for clinical inquiry. There

was no secondary prevention program in existence and evidence-based secondary prevention guidelines appeared to be underutilized in this cardiology department. The next step was to gather relevant data and identify available resources. Developing an understanding of the local and regional health care systems, including the social, political and cultural climate and layers of management of the organization was part of this data gathering phase.

Another important element of the data gathering was to understand what had come before; there was no need to reinvent the wheel. The DNP student interviewed people involved in practice change innovation and learned about existing successful programs in other regions and their strengths and limitations. Next the DNP student assessed whether existing program models could be applied to the population, medical department and institution in question. Goal-setting was an important next step: short and long term goals were made explicit. The multidisciplinary team group visit model was articulated as the program goal. Leadership skills such as professionalism and communication were applied in evaluating and recruiting potential dependable, trustworthy and competent multidisciplinary team members. The DNP student's role in leading and directing the multidisciplinary team was greatly facilitated by the high level of enthusiasm among team members for the group visits. This enthusiasm also translated into high quality team performance in carrying out the group visits, which then affected participants' satisfaction with the program and overall success of the pilot program. The challenge was how to temper their enthusiasm through effective communication skills and sensitivity. Different leaders and managers within the institution and in different regions were interviewed by the DNP student; these data provided insights on different leadership styles and clarified barriers and drivers of change.

Effective communication was important in every aspect of this program, from facilitating the success of the multidisciplinary team and staff by matching their abilities to the work, to carrying out the larger institutional mission to provide safe, quality care to patients. Effective

communication is also crucial when negotiating with hospital business managers to advocate for the group visit program.

### *Future work*

The DNP student's next challenge is to build a business proposal that makes the case for the sustainability of the secondary prevention of CHD group visit program. Another important next step is to incorporate participant feedback to improve the program (e.g. scheduling and logistics) – this iterative approach is key to effective leadership, as discussed above. There are many opportunities to expand leadership roles for DNPs. A DNP could work to facilitate the work of other APNs to develop similar programs in other areas of cardiology, such as atrial fibrillation, congestive heart failure, and patients with pacemakers. Another potential DNP role is to influence local policies around referral for secondary prevention. A DNP could work with hospitalists and primary care providers to refer patients to secondary prevention programs and increase utilization of this important service. The potential cost-effectiveness of secondary prevention group visits deserves scrutiny; a DNP could design and conduct a cost-effectiveness analysis using clinical data. Promoting CHD prevention in the community might be other options for future projects for the DNP. This DNP student also noted areas of personal improvement resulting from participation in this project. This experience conferred enhanced assertiveness and negotiation skills in dealings with barriers and influencing the drivers of change within the institution. In addition, the DNP student had the opportunity to improve motivational skills to facilitate patient lifestyle changes. Finally, dissemination of this project via peer-reviewed journals, conferences and word of mouth could provide an example and encourage other APNs to grow in their areas of specialty.

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SCHOOL OF NURSING  
Achana Kiamah Haha La Ganao Purand

## DNP Clinical Inquiry Project Report & DNP Portfolio Approval

Student Name: Winnifreda E. Licaycay ANP, MPH, DNP candidate

Degree: Doctor of Nursing Practice

Title of Study:

APN-led multidisciplinary group clinic visits for secondary prevention of coronary heart disease (CHD)

APPROVED:

Committee Chair: Anne Rosenfeld, PhD, RN, CNS Signature: Anne Rosenfeld  
(name and credentials)

Committee Member: M. Katherine Crabtree Signature: M K Crabtree  
(name and credentials) DNSc, FAAN, APRN, BC

Committee Member: \_\_\_\_\_ Signature: \_\_\_\_\_  
(name and credentials)

Michael R. Bleich, PhD, RN, MPH, FAAN  
Dean, School of Nursing

Signature: Michael R. Bleich

Date: May 29, 2009

Submit completed original form to the Graduate Program office.