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GENDER ANALYSIS OF LEARNING NEEDS IN FIRST TIME  
CORONARY ARTERY BYPASS GRAFT SURGERY PATIENTS:  
A SECONDARY ANALYSIS

by

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A thesis

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In partial fulfillment of the  
requirements for the degree of  
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Gender Analysis of Learning Needs in First Time  
Coronary Artery Bypass Graft Surgery Patients: A Secondary Analysis  
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Abstract

Gender differences in the preoperative profiles and postoperative outcomes of patients after coronary artery bypass graft surgery raises the question of whether gender also influences learning needs that may necessitate different approaches to the education of these vulnerable patients. The purpose of this study was to examine if learning needs differed between males and females after CABG surgery in the immediate period prior to and after discharge. This secondary analysis utilized a non-experimental, descriptive-comparative design based on existing data. The sample was selected based on a matched-pairs sampling method (32 males, 32 females). Learning needs were assessed through the use of the Patient Learning Needs Scale. Significant gender differences were found in the rank ordering of learning needs and the type of learning needs relating to physical activities only after discharge. These findings suggest that gender and the timing of appraisal may influence the learning needs of patients after CABG surgery.

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## CHAPTER I: INTRODUCTION

### Background

Cardiovascular disease (CV) is defined as any disorder involving the heart and blood vessels within the brain and throughout the body (Heart & Stroke Foundation, 2003). In Canada, CV remains the leading cause of death, more than any other illness. CV has also been shown to have a major economic impact. According to the Heart and Stroke Foundation, CV results in an estimated cost of over \$18 billion to the Canadian economy annually and rising.

The most common CV is coronary heart disease (CHD), which occurs when vessels supplying the heart become progressively narrowed or blocked and can no longer transport enough blood to meet the heart's demands (Heart & Stroke Foundation, 2003). In Canada, approximately 54% of all cardiovascular deaths can be attributed to CHD (Heart & Stroke Foundation). While there is no cure available, treatment focuses on slowing down the progression of the disease by pharmacological means or through coronary revascularization procedures, such as coronary artery bypass graft surgery (CABG) (Heart & Stroke Foundation). Often required for patients with established and extensive CHD, this operation can be life-saving (Fitzsimons, Parahoo, & Stringer, 2000).

CABG surgery is classified as an invasive procedure that can require rigorous management in order to promote optimal recovery (Heart & Stroke Foundation, 2003). After surgery, patients are transferred into a nursing unit where they are placed under close observation (Heart & Stroke Foundation). Here, patients are still at a high risk for possible complications of CABG surgery and are strictly monitored for symptoms such as lung congestion, infection, bleeding, and dangerous abnormal heart rhythms (Bernat, 1997; Huerta-Torres, 1998). Thus, it

is imperative that these vulnerable patients are monitored and treated for the potential complications of surgery as they begin the early process of recovery.

The early post-operative period after discharge can be especially challenging for patients (Klein-Fedyshin, Burda, Epstein, & Lawrence, 2005). Following hospital discharge, a major shift in responsibility for care is transferred from health care providers to the patients themselves (Klein-Fedyshin et al.). Thus, it is important that these patients are prepared to manage and respond to potential problems that can affect their health and recovery. This can be supported through the development of education programs that address the needs of these patients to adequately manage and care for themselves.

Although a vast amount of literature has described the treatment and recovery of patients after CABG surgery, research in this area has been traditionally based on knowledge derived from studies comprised of primarily male participants (Eastwood & Doering, 2005; Jickling & Graydon, 1997). As more data emerged that focused on issues regarding the experience of females with CHD, researchers found gender issues related to the pre-operative profiles and post-operative recovery patterns through the revascularization treatment of CABG surgery. This suggests that the experience may be different for males and females and raises the question of whether gender may also influence the type of information patients may want to know about after CABG surgery. To date, literature examining the influence of gender on the learning needs of patients after CABG surgery is limited and reveals findings that were conflicting. Thus, very little was known about gender differences in what these patients perceive was important to learn in order to independently manage their care at home (Jickling & Graydon). If gender may influence learning needs and, consequently, the delivery of patient education post-CABG surgery, further insight into what males and females perceived as important to care for

themselves at home can be informative in the development of more effective education programs.

### Gender Differences in Pre-Operative Profiles and Recovery Patterns after Surgery

Literature in coronary health reveals an abundance of information related to the differences in the pre-operative status of females compared to males undergoing CABG surgery. For instance, differences have been reported in the demographic profiles of males and females, where females were older, were more likely to be living alone, and were less likely to be married (Ayanian, Guadagnoli, & Cleary, 1995; Edwards, Albert, Wang, & Apperson-Hansen; 2005; Guru, Fremes, Austin, Blackston, & Tu, 2006; Vaccarino et al., 2003). These factors can reduce the number of available resources, such as social support (Eastwood & Doering, 2005), that females may have to psychologically and functionally cope with the disease. Several studies have also reported that females were more likely to have a lower socioeconomic status than males, which has been shown to be related to higher rates of heart disease and poorer outcomes after surgery (Eastwood & Doering; Edwards et al.; Guru et al.; Taylor, Ascione, Rees, Narayan, & Angelini, 2003). Furthermore, females were also more likely to have co-morbid conditions such as diabetes, high cholesterol, and high blood pressure when they experienced their first coronary event (Edwards et al.). This could place them at a higher post-operative risk and negatively influence their recovery (Ayanian et al.; Guru et al.; Vaccarino et al.; Williams, Choudri, Morales, Helman, & Oz et al., 2000).

Literature on post-operative outcomes also reveals gender-specific differences in recovery patterns. After experiencing a cardiac event requiring CABG surgery, females were less physically and socially active than males (Ayanian et al., 1995; Fleury & Cameron-Go, 1997). Also, females were more likely to report having less social support (King, Clark, &

Hicks, 1992; Sarpy, Galbraith, & Jones, 2000), which has been linked to an increased likelihood of experiencing recurrent cardiac events after CABG surgery (Case, Moss, Case, McDermott & Eberly, 1992). Moreover, females were also more likely to be readmitted after CABG surgery with unstable angina and congestive heart failure in the first year after surgery (Guru et al., 2006). In addition, the presence of preoperative risk factors such as age, and the presence of other pre-existing conditions contributed to an increase in post-operative morbidity among females as compared with males (Miller & Grindel, 1999; Sarpy et al.).

The data available on the pre-operative profiles and post-operative recovery patterns of females and males after CABG surgery suggest that major gender differences exist. This brings into light the question of whether gender may also influence learning needs that may necessitate different approaches to the education of these vulnerable patients. To date, it remains unclear as to whether there are differences that exist in terms of what learning needs males and females may perceive to be important in order to optimize their recovery at home. The limited information available related to gender differences in learning needs of patients post-CABG surgery revealed conflicting results. One gender comparison that examined learning needs found that no gender differences existed prior to discharge after CABG surgery (Jickling & Graydon, 1997). On the other hand, studies that have measured learning needs of CABG patients during hospitalization and after discharge suggested gender as a potential factor that can influence what males and females may want to learn about after surgery (Grady, Buckley, Cisar, Fink, & Ryan, 1988; Kattainen, Merilainen, & Jokela, 2004). The paucity in the research of gender differences in learning needs of CABG patients and inconclusive findings of existing studies warranted the need for further investigation. Insight into these differences can then help to inform the

development and delivery of more effective patient education programs that are geared towards addressing the gender-specific concerns of males and females.

### Self-Care Behaviors and Patient Education

Self-care describes the broad spectrum of behaviors and activities related to the adaptation and lifelong learning that is essential to regain a life of integrity with a chronic illness (Orem, 1991). Following discharge from the hospital after CABG surgery, these vulnerable patients continue to be at risk for potential problems that can affect their health and recovery. Thus, it is essential for nurses to promote self-care by providing the necessary education so that these patients are adequately prepared to independently manage their care as they transition from the hospital to the home environment.

Research that has examined the learning needs of CABG patients for self-care pre-discharge and in the post-operative period (up to 6 weeks post-surgery) can inform what type of information should be addressed in patient education programs. Collectively, these studies revealed that patient concerns have centered on the need for information related to activities, medication management, management and control of symptoms, and the prevention of post-operative complications (Goodman, 1997; Grady et al., 1988, Moore, 1994; Savage & Grap, 1999; Simani-Oren, 2003). First, although it may be important to engage in physical activities to promote endurance and strength, it is also as important to know when to resume physical activities after surgery (Simani-Oren). In addition, patients must also be prepared to appropriately manage and control symptoms that they may experience after CABG surgery (Goodman; Grady et al., Simani-Oren). For example, pain from the incision sites can be so debilitating that, if left uncontrolled, can leave the patient inactive and at risk for complications including pneumonia and blood clots (Frantz & Walters, 2001). Thus, patients must be equipped



with information related to pain management strategies, such as the appropriate use of analgesics for pain control (Frantz & Walters). Also, edema, or the swelling of the extremities, can occur among patients after CABG surgery (Frantz & Walters). To reduce edema, it may be helpful for patients to keep the affected extremity elevated and to avoid foods that are high in sodium content (Frantz & Walters). In addition, symptoms related to psychosocial functioning, defined as the combination of cognitive, social, and emotional aspects that can affect one's ability to perform everyday tasks of living and engage in relationships with others, can also be as important as physical healing (Simani-Oren). Also, patients are often discharged with a significant amount of new medications (Simani-Oren). Therefore, as another aspect of self-care, it is essential that they must be educated on how to effectively manage their medications at home (Frantz & Walters; Simani-Oren). How to recognize and treat potential post-operative complications is another integral component for self-care after CABG surgery. As a major contributor to patient morbidity and mortality, late recognition of post-operative complications can significantly impede recovery (Wilson & Tracy, 2000). Thus, patient education programs must assess and address the learning needs of CABG patients related to these interrelating domains of self-care behaviors to promote a more successful recovery.

### Significance of Study

Educational interventions that are directed to help patients effectively care for themselves at home are a key aspect in discharge planning post-CABG surgery. However, major changes in today's health care system have resulted in shorter hospitalization stays that can have a major impact on patient education. In only a few years, the average length of stay (LOS) has been reduced from 7-10 days to as short as two days after surgery (Frantz & Walters, 2001; Huerta-Torres, 1998). However, a shorter LOS can mean a higher turnover rate for patients and a

radical reduction in the amount of time available for valuable teaching. For example, in a study by Theobald and McMurray (2004), patients' needs for information and support following discharge after CABG surgery were not met as they expressed the need for an improvement in discharge planning. This calls for more efficient and effective education programs that are geared to prepare patients to independently manage their care once discharged (Beggs et al., 1988).

As an approach to patient education, individualized education programs present an opportunity for patients to identify what is important for them for self-care at home (Beggs et al., 1998). One method of individualizing education is to address the learning needs of patients related to self-care behaviors that can promote recovery after surgery (Redman, 2001).

The time of discharge can mean a great shift in responsibility from healthcare providers to the patients themselves (Klein-Fedyshin et al., 2005). Thus, the immediate period before discharge can be a crucial time for nurses to address the learning needs of CABG patients before they are sent home. Furthermore, little is known about the nature of these learning needs in the immediate period after patients are discharged and while the patient is recovering at home. Thus, examining the influence of gender in the pre and post-discharge periods can inform the development of education programs that anticipate and address any potential trends in the learning needs of CABG patients.

### Problem Statement

The impact of surgery is enormous and requires major adjustments for the CABG patient (Theobald & McMurray, 2004). Unfortunately, changes in today's health care system have resulted in shorter hospital stays that can have major implications in terms of time available for patient education (Frantz & Walters, 2001; Huerta-Torres, 1998). With higher acuity levels and

a faster turnover rate in hospitals, steps must be taken to ensure that patients are given the right education that addresses their specific learning needs. In order to develop more effective education programs, it is necessary to understand what factors influence the type of information patients may be looking for. Given the differences in pre-operative characteristics and post-operative recovery patterns of males and females after CABG surgery, one possible factor that may influence an individual's learning needs is gender. However, there is a paucity of research related to differences in what males and females perceive to be important to effectively manage their care at home after CABG surgery. Therefore, the *purpose* of this research was to determine if perceived learning needs differed between males and females post-CABG surgery in the period immediately prior to and following discharge. This research into the similarities and variations of their learning needs was intended to expand the knowledge base about gender differences in coronary health and ultimately help to shape individualized teaching strategies geared towards addressing the gender-specific concerns of these vulnerable patients.

## CHAPTER II: REVIEW OF LITERATURE

### Introduction

To explore the influence of gender on CABG patients' learning needs, a critical review of pertinent literature was conducted. This was followed by an examination of relevant studies that addressed gender differences in learning needs of other cardiac patients and other surgical populations. This was performed to gain a perspective related to the role of gender as a potential factor that can influence the type of information patients perceived to be important to help them manage their care at home.

The literature search revealed that various terms were used interchangeably to express the concept of the term *learning needs*; including the terms *information needs* and *educational needs*. For the purpose of this literature review, these terms were considered synonymous with the term *learning need* and referred to a perceived desire for information.

A search of the literature revealed only one study that primarily aimed to explore whether gender influenced the type of information CABG patients perceived as important for self-care (Jickling & Graydon, 1997). However, although not a primary aim of their research, two other studies that examined the learning needs of CABG patients found gender to influence the learning needs of their study participants (Grady et al., 1988; Kattainen et al., 2004). Thus, this section will first present and critique the research study whose primary aim was to explore the influence of gender on the learning needs of this population, followed by a review of other literature that has found gender differences in other cardiac and surgical patients.

#### Gender Differences in Learning Needs of Coronary Artery Bypass Graft Patients

In the one study that specifically examined gender and learning needs of CABG patients (Jickling & Graydon, 1997), the authors utilized a cross-sectional, descriptive-comparative

design with a sample of 20 males and 20 females to determine if the reported information required by both groups differed 24-48 hours prior to discharge. Jickling and Graydon used the self-administered Patient Learning Needs Scale (PLNS) that applied a 6-point Likert format to rate patients' perceptions of their learning needs related to the seven subscales of Treatment and Complications, Medications, Enhancement of Quality of Life, Activities of Living, Feelings related to Condition, Skin Care, and Community including Follow-Up. Patients were also asked open-ended questions related to information they perceived would assist them to manage their care at home.

The researchers found no statistically significant differences in scores on the subscales of learning needs identified on the PLNS between gender groups (Jickling & Graydon, 1997). Also, no statistically significant gender differences were found in the perceived overall learning needs as indicated by the overall PLNS scores. Also, although additional learning needs were identified by both groups in the open-ended questions, no significant gender differences were noted in the types of learning needs identified.

Several limitations were observed in Jickling and Graydon's (1997) study. First, as acknowledged by Jickling and Graydon, a small sample may explain why no significant differences in learning needs were detected. In other words, a small sample size may have increased the probability of committing a Type II error, or not detecting differences when they really existed (Burns & Grove, 2005). In addition, the PLNS as created by Bubela et al. (1990b), and applied in Jickling and Graydon, was developed to for use with general medical and surgical patients. The use of a measure that was designed for a more general patient population may have decreased the validity of its use among CABG patients in comparison to one that may have been developed specifically for patients of this population (Burns & Grove, 2005). Furthermore,

although the patients were instructed to answer based on their current learning needs, several participants indicated they were unsure of whether to rate the importance of the items on the PLNS irrespective of whether they already possessed the information (Jickling & Graydon). It was not known if patients who did not ask for clarification responded appropriately to the questionnaire (Jickling & Graydon). This may have affected their scores on the PLNS and, ultimately, the results of the study. Thus, the patients' varied interpretations of how to respond to the PLNS may have reduced the reliability of the measure, or the consistency of the use of an instrument, in the study (Burns & Grove). A reduced reliability may have increased the random error and may have contributed to the lack of gender differences in the study's findings (Burns & Grove). Therefore, given the limitations of this study and paucity of other studies in the literature that specifically examined the influence of gender on learning needs, further research is needed in order to help answer the question of whether males and females have different learning needs after CABG surgery.

In a study by Grady et al (1988), researchers explored what information was important among CABG patients and how well prepared they were after cardiac surgery. Using a descriptive design with self-report measures, 100 patients (81 males and 19 females) were asked to complete a questionnaire developed by the researchers that consisted of questions pertaining to the perceived importance of general categories of instructions related to their self-care. The patients were asked to complete the questionnaire at 5-10 days after CABG surgery, and then again at one to four weeks after discharge. At 5-10 days after surgery, there were no significant gender differences regarding the perceived importance of pre-discharge information. However, it is important to note that males reported feeling more prepared for the surgery than females. At one to four weeks after discharge, of the 54 patients (46 males and 8 females) who completed the

post-discharge questionnaire, researchers found statistically significant gender differences in the patients' responses related to the perceived importance of their learning needs. Specifically, females felt it was more important to know who to contact for information and medications. Males, on the other hand, reported a higher level of preparation related to the emotional changes after discharge than the females; suggesting females needed more information related to this learning need. Therefore, although not a primary aim of their study, findings of this study suggest the possibility of gender as a potential variable that can influence the learning needs of CABG patients. However, the use of a convenience sample and an under-representation of females were identified as methodological limitations by the authors of the study that can decrease the generalizability of the findings. In addition, the study was published almost two decades ago. Over the last twenty years, changes in the healthcare system, such as an increase in patient acuity and decreasing hospitalization stays, further limit the generalizability of this study. Therefore, more recent data are needed and further examination of this area is warranted to verify whether females and males of this population have different learning needs.

In a more recent study by Kattainen et al. (2004), researchers described the learning needs of 316 male and 116 female CABG patients. Using a repeated measures design with a sample of patients who were treated with elective CABG surgery, data were collected before surgery, and then at 6 and 12 months after surgery. To measure learning needs, researchers constructed the Nursing Information and Support Scale (NIS), a Likert-scale measure that included Psychosocial, Emotional Support, Physical, and Disease-Specific dimensions. The NIS was developed to measure the patients' perception of the importance of information, as well as the adequacy of the information they had received related to each of the dimensions.

Although not a primary aim of their study, Kattainen et al., (2004) reported gender differences in the learning needs of their participants. Before undergoing surgery, males needed significantly more information about the resumption of usual activities, as well as other aspects related to post-discharge care and healing of their incisions than did the females. Overall, females emphasized more learning needs related to psychosocial functioning prior to surgery. At six months following CABG surgery, the learning needs of females increased, while the learning needs of males decreased as manifested by a significant difference in mean NIS scores. Similarly, this trend continued at 12 months after CABG surgery when the learning needs of females increased, while those of males decreased. Overall, as comparable to Grady et al. (1988), females emphasized more learning needs related to psychosocial functioning. The study yielded a high follow-up response rate of 95% at six months, and then 89% at one year after surgery, thus increasing the external validity or generalizability of the study (Burns & Grove, 2005).

Generally, the literature suggests that the influence of gender on the perceived learning needs of patients after CABG surgery is a relatively untouched area of research. In addition, studies that have examined the relationship of gender and learning needs of CABG patients have produced results that were conflicting and limited in quantity. In addition, not one study has yet examined the influence of gender on the learning needs of CABG patients in the immediate period after discharge. To gain a broader perspective on the influence of gender on learning needs, it was also useful to look at literature that has examined gender differences in the learning needs of other patients who have undergone coronary revascularization interventions.



## Gender Differences in Learning Needs of Patients after

### Other Coronary Revascularization Procedures

In Kattainen et al. (2004), researchers also administered the NIS scale to patients who had undergone percutaneous transluminal coronary angioplasty (PTCA), an invasive coronary revascularization procedure for patients with CHD. In their sample of 123 males and 60 females, researchers aimed to describe the learning needs of PTCA patients prior to surgery, and then at six and 12 months post-discharge. Prior to surgery, researchers found that females needed significantly more information about usual activities, whereas males needed more information about post-discharge care, recovery, and information about coronary heart disease. At six months, males needed significantly more information on medications and elimination. Twelve months after discharge, males needed more information about medications and information regarding CHD.

Although PTCA is comparable to CABG surgery as a surgical technique for coronary revascularization, CABG surgery is more invasive, requires a longer recovery period, and more likely to be performed on high risk patients; such as those where CHD has affected multiple coronary vessels (Rihal, Racó, Gersh, & Yusuf, 2003). Therefore, the generalizability of the gender differences found is limited and more information regarding the role of gender in influencing the learning needs of CABG patients is needed.

### Gender Differences in Learning Needs of Patients after an Acute Coronary Event

To gain a broader perspective, a review of the literature that has examined gender differences in the learning needs of other cardiac patients was performed. This revealed a small number of studies that specifically examined gender differences in the learning needs of patients after experiencing acute forms of CHD, such as myocardial infarction (MI). In Ashton (1997),

the researcher used the Cardiac Patient Learning Need Inventory (CPLNI) that consisted of 43 items that were divided into 8 subscales according to information that has been shown to be important among cardiac patients. These eight subscales were: Introduction to Hospital Unit, Anatomy and Physiology, Psychologic Factors, Risk Factors, Medications, Diet, Activity, and Other Information. The researcher reported slight differences in the rank ordering of the learning needs perceived by their sample of 73 males and 48 females when data were collected upon their admission to a hospital unit. Both males and females indicated that Medications and Risk factors were the two most important learning needs. However, females emphasized Medications while males ranked Risk Factors as most important. A test for statistical significance of the rank ordering of these categories was not performed. A comparison of the means by subscales also revealed no significant differences by gender. However, of the 43 items in the CPLNI, statistically significant gender differences were found in comparing the means of six items. Specifically, females reported needing significantly more information related to cholesterol, triglycerides, activity restrictions, how to take a pulse, and general guidelines for physical activity. On the other hand, males reported needing significantly more information on when to engage in sexual activity. Ashton suggested that the small differences in the ranking of the categories may point to the importance of developing individualized teaching interventions for males and females after an MI to include more gender-specific information. However, it is difficult to generalize the findings of one study that examined learning needs of patients in only the acute stage of MI. Also, it is not known whether these gender differences are sustained until the immediate time period before they are discharged and once they are at home. Furthermore, although the findings suggest that gender may influence the learning needs of patients after an

MI, it is not known whether these findings can be generalized to a surgical population, such as those who have had CABG surgery.

Similarly, Jaworski (2005) found differences in what males and females hospitalized with their first MI ranked as most important to learn. The researcher also used the CPLNI to ask patients to rate their perceptions of the information as “not important” to “very important” in the eight categories of the scale. A comparison of the means of the eight subscales by gender revealed that there were no statistically significant gender differences. However, interestingly, although the top five ranked subscales of learning needs were the same for both genders, the order of importance differed. Males ranked Dietary Information, while females placed Physical Activity as the most important. A test for the statistical significance of these differences, however, was not performed.

A small convenience sample size of 23 in Jaworski (2005) limits the study’s external validity, or generalizability to other times and settings (Burns & Grove, 2005). In addition, an under-representation of females (5 total participants) and a small sample size may have influenced the capacity to detect differences if they existed (Burns & Grove), and may have contributed to a lack of significant findings. One threat to internal validity, or the extent to which the findings detected are truly reflective of reality (Burns & Grove), was also found in the study’s potential of testing effects (Burns & Grove). As Jaworski acknowledged, participants may have been exposed to the instrument used prior to the study that may have altered their responses and, consequently, the results. Therefore, more information is required before one can formulate any conclusions as to whether males and females have different learning needs after an MI.

In a study by Stewart et al. (2004), the researchers aimed to examine gender differences in the learning needs for health information after an acute ischemic event (ICE). In this prospective, longitudinal study, patients who had experienced a confirmed ICE (myocardial infarction or unstable angina) were recruited from 12 coronary intensive care units. They were mailed a follow-up questionnaire at 6 months that asked them about topics on which they would like more information. Of the 541 patients who responded, 398 patients (121 females and 277 males) reported needing more information. Further, there were significant gender differences in preference for information. Females, overall, reported significantly more learning needs. Also, they needed significantly more information on angina and high blood pressure, whereas males needed significantly more information about sexual function. When asked about their perception of how well their health care providers had met their overall learning needs for information, males felt significantly more informed than females. While the study did reveal significant gender differences in the learning needs for information after an ICE, it was not clear how these learning needs were measured, thus providing limited information on the reliability or validity of the instrument used or its administration.

#### Gender Differences in Learning Needs of Other Surgical Patients

A literature review of other populations revealed a very limited number of studies that have found gender differences in learning needs of other patients (Bubela et al., 1990a; Johansson, Hupli, & Sarantera, 2002). In Bubela et al., researchers explored variables that may be associated with the type of information general medical and surgical patients perceived as important to learn as measured by a PLNS. In this descriptive study with 301 (151 males, 150 females) adult medical and surgical patients preparing for discharge, Bubela et al. found that females reported significantly more learning needs than males as manifested by higher overall

scores on the PLNS. Also, significant gender differences were found in the types of learning needs identified; where females reported needing more information related to activities of living, and enhancing quality of life (Bubela et al.). Similarly, Johansson et al. (2002) also used a modified version of the PLNS to compare the learning needs of males and females after hip arthroplasty and found that gender influenced learning needs only during hospitalization prior to discharge. Specifically, females reported significantly more overall learning needs and significantly more learning needs in all categories relating to Medications, Support and Care in the Community, Treatment and Daily Activities, Complications and Symptoms, and Other Illness-Related Concerns (Johansson et al.).

#### Gender Differences in Learning Needs: Summary of Literature

In light of the literature reviewed, it was important to summarize the findings of studies to help understand the potential role gender may have in the learning needs of CABG patients. Generally, it was observed that, in studies that found gender differences, these were attributable to the type of learning need, overall learning needs, and rank ordering of learning needs. In addition, it was observed that the timing of the learning needs assessment could be categorized into the pre-discharge period at the hospital, and the post-discharge period when the patients were already home.

#### *Overall Learning Needs*

A difference in the overall learning needs for information relates to a difference in the perceived overall importance of learning needs for self-care identified by males and females. Among CABG patients, Jickling and Graydon (1997) reported no statistically significant gender differences in the overall learning needs for information presented in the PLNS among CABG patients 24-48 hours before discharge. However, in their much larger sample of CABG patients,

Kattainen et al. (2004) found that while the learning needs of males decreased at six and twelve months post-discharge, the learning needs of females increased. In addition, these differences were statistically significant (Kattainen et al., 2004). Expanding the literature to include other patient populations also revealed gender differences, where researchers have reported females reporting significantly more overall learning needs among patients pre-discharge after hip arthroplasty (Johansson et al., 2004), ICE patients (Stewart et al., 2004), and among general surgical and medical patients (Bubela et al., 1990a).

### *Type of Learning Need*

A review of the literature also revealed that gender differences were found in the types of learning need identified. In the context of this study, type of learning need referred to a particular kind of learning need relating to a domain of self-care after CABG surgery (e.g. Medication Management, Activities, Symptom Control, and Complications). Among patients after CABG surgery, a review of the literature revealed that no statistically significant differences were found in the types of learning needs of CABG patients in the 24-48 hour pre-discharge period (Jickling & Graydon, 1997). However, a significant difference was found in the type of learning needs in the period prior to CABG surgery (Kattainen et al., 2004), where males expressed needing significantly more information related to the resumption of activities, care of incisions, and post discharge care. On the other hand, females reported needing more information on psychosocial functioning prior to CABG surgery (Kattainen et al.). Also, in Kattainen et al., researchers found gender differences in the learning needs of patients prior to PTCA; where females needed more information on usual activities.

A search of the literature also revealed no studies that had investigated the role of gender in influencing the learning needs of CABG patients in the immediate period after discharge (24-

48 hours). However, an examination of other research that examined gender and learning needs of CABG patients at other time points after the patient has been discharged, revealed statistically significant gender differences at one to four weeks after discharge (Grady et al., 1988), and at six and 12 months after discharge (Kattainen et al., 2004). Also, significant gender differences were found in Grady et al., suggesting females needed more information on psychosocial functioning. Furthermore, among patients who had undergone PTCA, Kattainen et al. found that males needed more information about medications and elimination at six months after discharge, and about medications and information related to CHD one year after surgery. In other patient populations, researchers also found significant gender differences in the learning needs of ICE patients at six months after discharge; where females expressed needing significantly more information in areas related to angina and high blood pressure, whereas males needed significantly more information about sexual function (Stewart et al., 2004).

### *Rank Order of Learning Needs*

Rank ordering refers to the arrangement of the learning needs in order of perceived importance from least to most important. The research to date that had explored gender differences in the learning needs of CABG patients has not examined level of statistical significance in the rank ordering of the learning needs reported by this patient population. On the other hand, while tests for statistical significance were not performed, gender differences reported among MI patients in Ashton (1997) and Jaworski (2005) hint at the possibility that one's gender may affect their perceived importance of learning needs after an MI.

Not one study was found that specifically examined gender differences and tested for statistical significance in the rank ordering of learning needs in patients after CABG surgery. However, gender differences reported in other patient populations in the early recovery period

*before* discharge (Ashton, 1997; Jaworski, 2005) hint at the possibility that perhaps gender differences may also be echoed in the early recovery period *after* discharge.

### Conclusions from Literature Review

As an invasive procedure that requires extensive and rigorous management to promote optimal recovery (Heart & Stroke Foundation, 2003), it is critical that patients who have undergone CABG are adequately prepared to recognize, manage, and deal with potential problems at home. An abundance of literature available on the reported gender differences related to pre-operative profiles and post-operative recovery patterns of CABG patients may be indicative of gender as a potential factor that can influence what type of information these patients may be looking for. Furthermore, a review of the literature on gender differences in learning needs of patients during their hospitalization and in the post-operative discharge period further hints at the possibility of gender as a potential influence on the perceived learning needs of CABG patients (Grady et al., 2002; Kattainen et al., 2004). Expanding the literature review to include other cardiac and surgical populations also suggests the possibility of gender as an influence on the of information perceived as important to learn as manifested by differences in rank ordering of information, type, and overall learning needs identified by males and females (Ashton, 1997; Bubela et al., 1990a; Jaworski, 2005; Johansson et al., 2002; Kattainen et al.; Stewart et al., 2004).

A review of the one research study that specifically examined the influence of gender on the learning needs of patients after CABG surgery at the time of discharge revealed no statistically significant differences but was limited by a small sample size and the use of an instrument that was developed to apply to the general medical and surgical population (Jickling & Graydon, 1997). Furthermore, this study was published a decade ago and changes in the



healthcare system, such as shorter hospitalization stays and the increasing acuity of patients, call for more recent data with instruments that have been adapted for use with CABG patients in this relatively untouched area of research. Thus, the current study was unique in employing the use of a version of the same instrument that was previously developed to apply to general medical and surgical patients and specifically modified for use with CABG patients to examine gender differences in learning needs related to their self-care.

Literature that has examined the influence of gender on the learning needs of patients before discharge has been limited. Furthermore, no study was found that has specifically examined the influence of gender on the learning needs of patients immediately after discharge. Thus, it was evident that research in the area of gender differences in the learning needs of CABG patients in the immediate period right before discharge and in the immediate period post-discharge required more investigation. Therefore, the study was valuable in that it examined an area that was relatively untouched by research and assessed the influence of gender on learning needs of this vulnerable patient population.

## CHAPTER III: CONCEPTUAL FRAMEWORK

### Introduction

This chapter will integrate concepts derived from the Conceptualization of Constrained Choices as described by Rieker and Bird (2005) and the Process of Patient Education outlined by Redman (2001) to explicate how gender can potentially influence the meaning males and females may attach to specific information and, consequently, to particular learning needs. Definitions of key terms will be presented and the chapter will conclude with the conceptual framework to describe the relationship among the key variables of interest.

### Definition of Key Variables

#### *Gender*

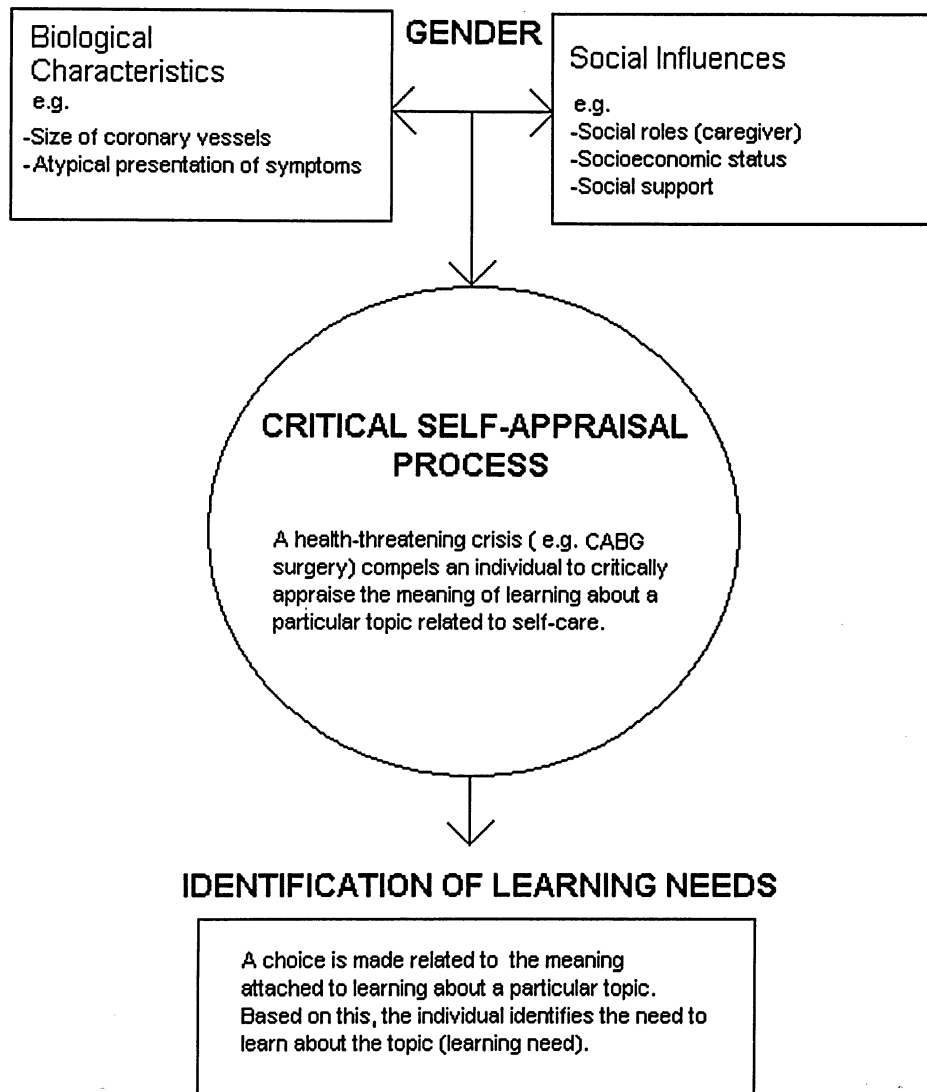
In contrast to the term sex, which describes the biological differences that distinguish males from females, gender has been defined as an individual's self-representation that is both biologically and socially constructed (Allen & Szanton, 2005). Included in the development of one's gender are also the ways in which social roles and expectations have been assigned to individuals based on their biological differences (Allen & Szanton). With respect to CHD, researchers have contributed to our understanding of gender as a biological and social construct and its role in explaining health differences between males and females. For example, biological explanations have suggested that the smaller coronary vessels in females were linked with the atypical presentation of CHD symptoms among this gender group (Eastwood & Doering, 2005; Miller & Grindel, 1999). Furthermore, researchers have also suggested that gender differences in social roles, where females were more likely to become a caregiver to an aging spouse or become single parents, can generate or intensify economic needs (Rieker & Bird, 2005). Thus, differences in the social roles and functions females hold in society can then help to explain

gender disparities in socioeconomic status, a known factor that can contribute to higher rates of CHD and poorer outcomes after CABG surgery (Eastwood & Doering).

Literature that has examined the role of gender on learning needs has measured gender based solely on the biological characteristics of the individual as being either male or female (Ashton, 1997; Grady et al, 1988; Jaworski, 2005; Jickling & Graydon, 1997; Kattainen et al., 2004). In addition, although gender is defined as a complex interplay of biological and social influences, information about the social aspects of one's gender (e.g. social roles individuals may hold) has not been captured or measured in previous literature that has examined gender as a potential factor that can influence the learning needs of patients. For the purposes of this study, and consistent with the literature available, the researcher operationally defined and measured gender based on an individual's self-reported "sex" (male or female) or the biological component of gender (See Figure 1). However, although not directly measured, the researcher acknowledges that the social influences of one's gender are not independent of their sex.

### *Learning Needs*

A learning need is described as information that is personally sought by an individual in an attempt to re-establish personal control and manage the events brought on by a stressful situation, such as illness (Bubela et al., 1990b). According to Redman (2001), the type of information one may perceive as important can differ from one person to another. One way to assess one's perception of the importance of a specific topic is an assessment of their learning



Adapted from Redman (2001) and Rieker and Bird (2005).

*Figure 1.* Role of gender in the critical appraisal of information and identification of learning needs.

*Note.* The current study highlights the biological component and used one's self-reported "sex" as a measure of gender.

needs. Thus, as an integral part of the patient education process, an assessment of learning needs, as reported by individuals themselves, can be used to guide the type of information a healthcare provider will cover when providing patient teaching.

The learning needs of CABG patients measured in this study were derived from what have been identified in the literature. These related to four domains of self-care behaviors that have been found to be important among CABG patients post-surgery; Medication Management, Complications, Activities of Living, and Symptom Control (Goodman, 1997; Grady et al, 1988; Moore, 1994; Sampson & Doran, 1998). Only the learner can truly provide his or her perception of the importance they attach to particular information (Redman, 2001). Thus, the learning needs related to these four domains were assessed by a self-report measure, the Patient Learning Needs Scale.

#### Relationships between Variables of Interest

Literature on coronary health has revealed a multitude of differences in the experiences of males and females with CHD. As a result, a number of theories have surfaced in an effort to explain why these differences exist. For example, as already stated, researchers have proposed that biological mechanisms such as the size of coronary vessels are responsible for the atypical presentation of signs and symptoms experienced by females during a cardiac event (Eastwood & Doering, 2005; Miller & Grandel, 1999). These differences in presentation of CHD have been known to affect females in their response to seeking treatment, as well as receiving a referral for diagnostic testing (Eastwood & Doering). In addition, social factors have also emerged to give explanations to gender differences in coronary health. For example, according to the World Health Organization (as cited in Eastwood & Doering), one frequently cited reason why smoking rates are declining less in females than in males is the common perception of smoking as a

method of weight-control. In addition, females in North America, in all age groups, earn less money, have fewer years of formal education, and hold more occupations that are considered 'lower' in status (i.e. homemaking) than males (King & Arthur, 2003). Particularly for those who are single heads of families, this can play a role in how females prioritize choices regarding their health (King & Arthur) by limiting their financial resources after a coronary event such as CABG surgery. In addition, socialization of females in our society promotes for them to hold and internalize an "other" orientation, in other words, females are socialized to value the well-being of others over themselves (King & Arthur). This may perhaps influence their capacity to focus and act on health information for themselves. Therefore, gender differences in the social and biological experiences of males and females with CHD suggest that differences may also be present in the type of information patients perceive will be important so that they can independently manage their care at home.

Despite the current theories that account for why gender differences in health occur, Rieker and Bird (2005) argue that a theoretical understanding of the complexity of gender differences in choices regarding health needs go beyond the narrow focus of strictly biological or social rationales. In an effort to account for why males and females may make different choices regarding their health, Rieker and Bird introduced the concept of Constrained Choice that draws on the integrated role of social and biological influences. The process by which an individual makes choices regarding his or her health can be 'constrained' by their biology and the broader social context in which they are embedded. For example, in CHD, a lower SES among females may place a 'constraint' on their ability to pay for costly medications. In addition, literature has also revealed that females have a multitude of social obligations (e.g. work life, family demands, and caring for aging parents) that can limit their time to engage in exercise and physical activity

(Eastwood & Doering, 2005). Thus, a model that synthesizes the multifaceted and complicated interplay of biological characteristics and sociological influences can aid in our understanding of why females and males may make different decisions regarding their health and, subsequently, their learning needs.

According to Redman (2005), a health-threatening crisis, such as CHD and CABG surgery, can compel an individual to engage in a critical self-appraisal process and reflect on the meaning of their situation. One way this can be manifested is in the degree of importance individuals attach to learning about information that they perceive is important to help them to manage their care at home. Thus, only if an individual has appraised the outcomes of learning about a particular topic (e.g. medication management), as meaningful will he or she identify that as an important learning need (Redman, 2001).

It is important to note that the biological and social factors influencing the critical self-appraisal process can vary at differing time points and settings (i.e. context of one's situation). Thus, the perceived importance of learning needs appraised by patients at one point in the CABG recovery continuum will vary when appraised at another point. In this study, the researcher was interested in how perceived learning needs varied at two time points and settings; 24-48 hours prior to discharge while at the hospital, and 24-48 hours post-discharge when the patient is at home.

Ultimately, the importance placed on learning about a particular topic is reflective of a choice, after a critical self-appraisal process, to identify a learning need. In other words, the identified importance of a learning need is the end result of an appraisal process when a patient 'chooses' the importance of learning about a particular topic. For example, using Rieker and Bird's (2005) assumptions, the older onset of CHD among females in addition to the multiple

social roles they hold (e.g. primary caregiver to an older spouse or parent) may theoretically affect their priorities and the choices they make. Caring for the older spouse or parent may have previously exposed females to medications that have been prescribed for them. Thus, females may report a lesser need to learn about management of medications. The critical self-appraisal process, which is influenced by biological and social influences and is context-specific, can explain why differences may occur in terms of what males and females may choose as more valuable to learn to help them manage their care post-CABG surgery (See Figure 1).

#### Identification of Assumptions

1. Adults are capable of critical self-appraisal when faced with a health crisis (Redman, 2001).
2. The critical self-appraisal process is influenced by a complex interplay of biological and social processes (see Figure 1).
3. Adults are not receptive or willing to learn unless they have critically appraised the outcomes of learning about a particular topic as meaningful (Redman, 2001).
4. The greater the meaning attached to the outcomes of learning about a particular topic, the stronger is the adult learner's willingness to learn and the greater is the perceived importance of that learning need.
5. The perceived importance of learning needs appraised by individuals at one time point and setting in the CABG recovery continuum will vary when appraised at another time point and setting (e.g. pre-discharge at the hospital and post-discharge in the patient's home).



## Research Purpose, Questions, and Hypotheses

### *Purpose*

The theoretical propositions in combination with the literature reviewed formed the basis of this pilot study. The purpose was to examine, describe, and compare learning needs identified by males and females who had undergone a first CABG at 24-48 hours before discharge and at 24-48 hours after discharge.

### *Research Questions*

The research questions addressed by this study included:

1. Are there significant differences in the perceived overall importance of learning needs for information between males and females who have undergone first-time CABG surgery?
2. In the 24 to 48 hours pre-discharge period, are there significant differences among male and female first-time CABG surgery patients in their a) type of learning needs, b) perceived overall importance of learning needs and c) rank ordering of learning needs?
3. In the 24 to 48 hours post-discharge period, are there significant differences among male and female first-time CABG surgery patients in their a) type of learning needs, b) perceived overall importance of learning needs and c) rank ordering of learning needs?

### *Hypotheses*

The hypotheses tested were as follows:

1. There will be a significant difference in the perceived overall importance of learning needs for information identified by male and female CABG surgery patients.  
Specifically, the perceived overall importance of learning needs for information will be significantly higher among females.

2. There will be a significant difference in the type of learning needs identified by male and female CABG surgery patients in the 24-48 hour pre-discharge period.
3. There will be a significant difference in the type of learning needs in the area of psychosocial functioning identified by male and female CABG surgery patients in the 24-48 hour pre-discharge period. Specifically, females will report more learning needs related to psychosocial functioning than males.
4. There will be a significant difference in the perceived overall importance of learning needs for information identified by male and female CABG surgery patients in the 24-48 hour pre-discharge period.
5. There will be a statistically significant gender difference in the rank ordering of learning needs identified by male and female CABG surgery patients in the 24-48 hour pre-discharge period.
6. There will be a significant difference in the type of learning needs identified by male and female CABG surgery patients in the 24-48 hour post-discharge period.
7. There will be a significant difference in the type of learning needs in the area of psychosocial functioning identified by male and female CABG surgery patients in the 24-48 hour post-discharge period. Specifically, females will report more learning needs related to psychosocial functioning than males.
8. There will be a significant difference in the perceived overall importance of learning needs for information identified by male and female CABG surgery patients in the 24-48 hour post-discharge period. Specifically, the perceived importance of learning needs for information will be significantly higher among females.

9. There will be a statistically significant gender difference in the rank ordering of learning needs identified by male and female CABG surgery patients in the 24-48 hour post-discharge period.

### Summary

Recent changes in today's healthcare environment have had a major impact on patient education. Therefore, knowledge of factors that can influence the learning needs of CABG patients can be beneficial to help inform health care practitioners on how to develop more efficient educational programs. Specifically, it was the purpose of this research to examine how one's gender could affect the decisions they may make about what they identify as important learning needs for self-care. Ultimately, research into the differences in what males and females perceive to be important learning needs can be vital in providing a more gendered approach to patient education.

The empirical literature reviewed revealed limited and conflicting information related to differences in the learning needs males and females might identify as important in order to effectively manage their care at home. However, Rieker and Bird's (2005) conceptualization of Constrained Choice integrated with Redman's (2001) Process of Patient Education provided a theoretical rationale as to why males and females may make different choices in terms of the learning needs for information that may help them to care for themselves at home. Therefore, it was postulated that the overall perception, type, and rank order of learning needs identified by male and female CABG patients would be different at the period prior to discharge, and the period after discharge.

## CHAPTER IV: METHODS AND PROCEDURES

### Introduction

The following chapter will describe the methods and procedures used in this secondary analysis. Details of the parent study from which data were drawn will be summarized first. Next, a description of the design and processes used in selecting the sample from the parent study for the secondary analysis will be provided. This is followed by a section on the ethical aspects and considerations. The methods used in data collection and analysis will then be identified.

### Parent Study

#### *Research Design and Purpose*

The parent study utilized a randomized, pre-test-post-test control and experimental group design to evaluate the most appropriate time for delivering individualized patient education for self-care in the CABG population (Fredericks, 2006).

#### *Sample*

Participants were recruited from a single-setting on a post-operative cardiac surgery floor in a university-affiliated hospital in Toronto. Using the method of convenience sampling, the investigator approached post-CABG surgery patients who were to be sent home within 24-48 hours. The inclusion criteria for participants were:

1. Patients who had their first CABG surgery,
2. Literate in English,
3. Cognitively oriented to person, place and time,
4. Had access to a working phone in the hospital or at home.

Based on these inclusion criteria, two groups (pre-discharge and post-discharge) were randomly formed to determine the efficacy of an individualized patient education intervention based on the timing of when the education would be delivered (Fredericks, 2006). The group whose learning needs were assessed at 24-48 hours pre-discharge consisted of 64 participants (11 females, 53 males), while the post-discharge group whose learning needs were assessed 24-48 hours after discharge consisted of 66 participants (15 females and 51 males) resulting in a total sample of 130 participants.

*Instrument: The Patient Learning Needs Scale*

The learning needs of the participants were assessed using the Patient Learning Needs Scale which was administered by the researcher to the participants via telephone (Fredericks, 2006). Designed to measure perceptions of learning needs of patients who are preparing for discharge from hospital to home, the PLNS was originally developed to apply to a general population of medical and surgical patients at the time of discharge (Bubela et al, 1990b). The development of the original PLNS first consisted of a generation of a list of 75 items by pooling data from informal patient interviews, findings in the literature, and from the clinical experiences of five nurses. Responses to each item were to be rated on a Likert format employing six responses from 0 (not applicable) to 5 (extremely important). Next, a panel of 20 individuals that included nurses, doctors, patients, and non-hospitalized individuals reviewed the PLNS for representativeness, clarity, and level of difficulty in completing the items. As a result, one item was added and the wording of several items was changed to enhance clarity.

The psychometric evaluation of the PLNS was based on the responses of 301 adults ranging in age from 18-80 years who were hospitalized with a medical or surgical condition (Bubela et al., 1990b). Although the development of the scale was guided by the prediction that

five subscales or domains would emerge, a factor analysis yielded seven subscales or domains including Medications, Activities of Living, Community and Follow up, Feelings related to Condition, Treatment and Complications, Enhancing Quality of Life, and Skin Care. In addition, analysis of the responses and inter-item correlations led to the deletion of items from the instrument to result in a total of 50 items for the PLNS.

For the 50-item PLNS, internal consistency reliability using Cronbach's alpha ( $\alpha$ ) yielded an alpha coefficient of 0.95 (Bubela et al., 1990b). It was also reported to have face and content validity based on discussions with an expert panel and informal patient interviews. The 50-item PLNS was developed to be easily administered and was determined to usually require less than 20 minutes to complete.

High internal consistency reliabilities of the PLNS have also been reported in other studies. In a study that explored the perception of learning needs of 45 patients who had undergone short-term surgical procedures, an internal consistency reliability using Cronbach's  $\alpha$  yielded a value of 0.89 for the total scale (Jacobs, 2000). A study that described patients' learning needs after hip arthroplasty also reported high alpha coefficients (Johansson et al., 2002). Using a shortened version of the PLNS, researchers administered their questionnaire to patients during their hospitalization after hip arthroplasty, and at 2 weeks after discharge (Johansson et al.). Their modified PLNS also yielded a high internal consistency reliability of 0.96 for the total scale administered after surgery, and 0.98 for the total scale after discharge (Johansson et al.). Reliability of the PLNS for the total scale was also reported to be 0.94 in the study by Jickling and Graydon (1997) where researchers compared the learning needs of female and male CABG patients 24-48 hours prior to discharge. Thus, generally, its use in other studies has yielded high reliability alpha coefficients.

In the parent study, Fredericks (2006) modified the content of the PLNS with one of the original developers of the scale to reflect on the learning needs of the sample of patients who had undergone CABG surgery. Two experts reviewed the 13 items in the modified version of the PLNS (Fredericks, 2006). Based on this, the relevance of the items in the tool was rated as having a high content validity index of 100%. The PLNS used in the parent study was a 13-item, self-administered scale that measured CABG patients' perceptions of the importance of specific learning needs (See Appendix B). These learning needs related to self-care in the four subscales; Medication Management, Complications, Activities of Living, and Symptom Control. The scale employed a 5-choice, Likert format with responses ranging from 1 (not important) to 5 (extremely important). Patients rated the importance of each item to yield an overall score (with a possible range of 13-65) and a score for each of the four subscales that corresponded to a learning need domain. Furthermore, included in the subscale of Symptom Control were two items related to psychosocial functioning (see Appendix B).

In the parent study, the researcher administered the tool to the two groups (pre and post discharge) and assessed their learning needs via telephone. Patients were asked to rate the importance of the items presented on the PLNS. Therefore, the researcher was available to address any questions that arose from the administration of the questions in relation to the PLNS. After the learning needs were assessed, the individualized patient education intervention was delivered by the researcher via telephone.

### *Ethical Considerations*

Ethics approval for the parent study was obtained from the Ryerson University Human Ethics Research Ethics Board and from the facility where the study was conducted. Written informed consents were also obtained from the participants to voluntarily participate in the research study.

## Current Study

### *Research Design*

This pilot study was based on a secondary analysis of existing data from the parent study described above. A non-experimental, descriptive-comparative design was used to examine, describe, and compare gender differences in the learning needs of CABG patients in the immediate period of 24-48 hours prior to discharge and in the early recovery period of 24-48 hours post-discharge.

### *Sample*

The sample was drawn from existing data collected for the parent study. First the data set was limited to include only the data from participants who completed the PLNS questionnaire. Then, two groups were formed by sampling males and females from each of the two time periods established in the original study (pre-discharge and post-discharge). To enhance the strength of the study in detecting gender differences, data were extracted to yield an equal number of males and females for both the pre-discharge and post-discharge groups (Burns & Grove, 2005). In both groups, there were considerable fewer females than males. Therefore, the number of eligible female participants was the limiting factor in determining the sample size for the secondary analysis. In the parent study, there were 17 and 15 females in the pre-discharge and post-discharge groups respectively. Therefore, in order to sample equal numbers of males and females for each group, 34 participants ( $n = 17$  males;  $n = 17$  females) were sampled from the pre-discharge group and 30 participants ( $n = 15$  males;  $n = 15$  females) from the post-discharge group. This yielded a total of 64 participants ( $n = 64$ ) for the secondary analysis.

Given the relatively small number of accessible participants that could be included from each group, one way to add rigor and increase internal validity was to decrease the possibility of



random error through the control of potential extraneous variables (Burns & Grove, 2005).

Therefore, a matched pairs approach was used to control for differences in demographic and clinical characteristics between males and females that have been found to be important in CHD outcomes (Burns & Grove). First, the data set for the parent study was separated into two groups according to the time period (pre-discharge and post-discharge) and sorted by gender. Since age has been identified as being different for males and females with CHD before and after CABG surgery (Ayanian et al., 1995; Shafer & Corish, 1998), age was the first matching criteria. One female was drawn and matched with a male according to age (plus or minus 2 years). However, if there were no matches using this age criteria, the age window was increased until a match was found. This age window was increased to a maximum of seven years in the pre-discharge period and five years in the post-discharge period.

In addition to age, another characteristic that has been found to be different in the profiles of males and females before and after CABG is the presence of co-morbidities such as diabetes (Williams et al, 2000). Therefore, the presence of diabetes was a further criterion that was used in matching males with females. For example, if a female reported the presence of diabetes, only the males from the pool of data that had been previously selected based on age and with a history of diabetes were included.

Controlling for these potential extraneous variables may allow a more accurate examination of the effect of gender on one's learning needs post-CABG surgery and can add rigor and enhance the internal validity of the study (Black, 1999; Burns & Grove, 2005). Therefore, if a difference were found, one was more certain in suggesting that the difference was attributed to gender rather than differences in age or the presence of co-morbidities (i.e. diabetes).

## *Data Collection Methods*

### *Demographic Data and Clinical Characteristics*

Demographic data and data of clinical characteristics were derived from the parent study (see Appendix A). This included age (in years), gender (male or female), level of education, marital status, number of bypasses, and presence of other illnesses or conditions (Fredericks, 2006).

### *Learning Needs: The Patient Learning Needs Scale*

Use of the version of the PLNS as developed by Fredericks (2006) for the current study enabled the examination of gender differences in learning needs of CABG patients with a PLNS that was specifically adapted for use with this patient population. This is unlike the PLNS used in Jickling and Graydon (1997) where researchers used a version that was developed to apply to general medical and surgical patients (Bubela et al., 1990b).

For the purpose of the secondary analysis, an internal consistency reliability coefficient was calculated using Cronbach's  $\alpha$ . Cronbach's  $\alpha$ , a test for internal reliability (Burns & Grove, 2005) of all the items on the PLNS revealed a high reliability coefficient of 0.912 for the total scale in the pre-discharge group and 0.949 for the total scale in the post-discharge group. Cronbach's  $\alpha$  of the items in the scale for both groups combined also revealed a high reliability coefficient of 0.931.

### *Ethical Considerations*

The current study was reviewed by the Ryerson University Human Ethics – Research Ethics Board and approval was obtained to conduct a secondary analysis based on existing data from the parent study. No direct risks to human participants were anticipated as the researcher utilized existing data and did not seek new information or alter any other conditions that were

outlined in the original consent process of the parent study. No new recruitment of human participants took place. In addition, names and other contact information were not disclosed to the present investigator to protect the privacy of the participants. Instead, codes were used to link the data to each participant. Furthermore, the integrity and confidentiality of the data were maintained by restricting access to and storing the information in a password-protected computer file.

### *Data Analysis*

#### *Alpha*

The level of significance, or the probability of making a Type I error, was set at an alpha level of 0.05 (Burns & Grove, 2005). This level of significance was chosen instead of a more stringent significance level (e.g.  $\alpha = 0.01$ ) to detect any indications of differences that could be found in the data available. Taking this into consideration with the sample size and the importance of detecting any differences, the researcher set the alpha at the conventional value of 0.05 (Burns & Grove, 2005).

#### *Descriptive Statistics*

*Demographic characteristics.* Descriptive statistics were calculated to describe demographic characteristics of males and females in the total sample and in each period (pre-discharge and post-discharge). Frequency and percent of ordinal data such as level of education (from some high school or less to some college/university or more), and nominal data such as marital status were calculated.

As a non-parametric test to examine whether two variables are related or independent of each other (Burns & Grove, 2005), a chi-square analysis was carried out to test for significant variation in level of education between genders in the total sample, and in each of the pre-

discharge and post-discharge periods (e.g. level of education among females in the pre-discharge group compared to the level of education of males in the pre-discharge group). Also, a chi-square analysis was used to test for significant differences in level of education among males in both periods, as well as among females to help indicate whether there were significant differences in the level of education by period. This can be useful in determining whether significant differences in learning needs detected were attributable to gender or may be influenced by one's level of education. For example, if there were a statistically significant difference in level of education between males and females in one period, one cannot exclude the possibility that any significant gender difference found may be attributable to differences in level of education. Similarly, if males in one period were found to have a statistically significant difference in level of education compared to males in another period, one cannot exclude that any significant gender differences may be influenced by a higher or lower level of education in one period.

According to Norwood (2000), when computing a chi-square analysis for a 2 X 2 table, as in the case of comparing gender and one other variable, the expected frequency of each cell should be no less than five. Given the very low frequencies using the categories in the demographic questionnaire, the categories in the level of education were collapsed. As a result, the level of education consisted of two groups (some high school or less, and trade school to college/university).

*Clinical characteristics.* The range, mean, and standard deviation of the number of bypasses involved in the CABG surgery were calculated for males and females in the total sample and for each period. Also, literature on the profiles of males and females has suggested that females tend to have more co-morbid illnesses than males which can impact on their

recovery after CABG surgery (Ayanian et al., 1995; Guru et al., 2006; Vaccarino et al., 2006; Williams et al., 2000). Therefore, the mean, standard deviation, and range of number of co-morbidities, as well as the top four reported co-morbidities, were reported for the males and females in the total sample and in each period. Literature has also revealed that females who undergo CABG surgery generally have more co-morbid illnesses (Ayanian et al., Guru et al., Vaccarino et al.). To test for significant differences in the number of co-morbidities between males and females, separate t-tests for independent samples were carried out to compare the mean number of co-morbidities in the total sample and in each of the pre and post discharge periods. In addition, high blood pressure and high cholesterol are known to be risk factors of CHD that have been suggested to negatively influence the recovery of patients after CABG (Ayanian et al., Guru et al., Vaccarino et al.). Thus, chi-square analysis was conducted to test for significant differences among males and females who had these co-morbidities in the total sample. Given the lower observed frequencies in the pre and post discharge period, a chi-square analysis was not conducted in these cases.

*Gender and learning needs.* The PLNS yielded a score for each subscale and a total score. Although the values are ordinal-level data, the summed scores in Likert scales can be treated as interval-level data (Burns & Grove, 2005). Separate mean scores were calculated for the overall PLNS and each subscale for analysis. The higher the mean score associated with a particular subscale, the higher was the meaning placed by an individual on the importance of seeking information about that learning need domain corresponding to that subscale.

Furthermore, the higher the overall score on the PLNS, the higher was the individual's overall perception of the importance of information presented on the PLNS. Measures of central tendency consisting of mean, standard deviation, as well as range were calculated for overall

scores and for each subscale and were reported separately for males and females in the total sample and in the pre-discharge and post-discharge groups. Also, literature has revealed differences in learning needs relating to psychosocial functioning between males and females after CABG surgery (Grady et al., 1988; Kattainen et al., 2004). Therefore, a mean, standard deviation, and range of the scores of the two items pertaining to psychosocial functioning (see Appendix B) were reported by gender and by period. Finally the rank order of learning needs based on the mean score of each subscale was displayed according to gender and period.

### *Hypothesis Testing*

Separate t-tests for independent samples were calculated for hypotheses 1, 2, 3, 4, 6, 7, and 8, in order to test for gender differences in overall PLNS scores and for each subscale in the total sample and in each period. To test hypotheses 3 and 7, the mean scores of the two items pertaining to psychosocial functioning were combined prior to performing the t-tests. All the t-tests were for independent samples and were two-tailed. However, given the directional nature of hypotheses 1, 3, 7, and 8, one-tailed t-tests for significance were used in these cases (Burns & Grove, 2005).

To compare and test for statistical differences in the rank ordering of learning needs as proposed in hypotheses 5 and 9, a non-parametric test called the Mann-Whitney U test for independent groups was used to compare the rankings of the PLNS item mean scores between males and females (Burns & Grove, 2005). This test helped to determine if significant differences existed in how males and females ranked their learning needs in order of importance. First, the mean scores of each item on the PLNS were calculated for men and women separately and then pooled together (total of 26 mean scores; 13 for males and 13 for females). The pooled mean scores were then arranged from lowest to highest and assigned a rank value starting with

the rank of 1 for the lowest value. For example, in the pre-discharge period, the item with the lowest mean score ( $M = 1.89$ ) was associated with the male gender and related to management of fatigue/tiredness. Thus, this item was assigned the lowest rank value of 1. In instances where mean items scores were identical, these scores were assigned the same average rank value (Black, 1999). Next, the rank values were summed for the males and for the females. A Mann-Whitney U was then calculated to determine whether the distribution of the rankings for the males and females were statistically significantly different from each other and varied more than could be expected by chance (Black).

## CHAPTER V: RESULTS

### Introduction

The following chapter begins by first describing the results of the descriptive statistics for the demographic and clinical characteristics of the total sample and the sub-samples in the pre-discharge and post-discharge periods. This is then followed by a presentation of the results of the descriptive statistics of the learning needs according to PLNS scores by gender, and a description of the learning needs in order of importance by gender of the total sample, and of the pre-discharge and post-discharge groups. Afterwards, the results of the statistical analyses as each relates to the hypotheses are presented.

### Characteristics of the Sample

#### *Demographic Characteristics*

##### *Age*

The total sample consisted of equal numbers of males and females. Also, matching for the demographic characteristic of age resulted in similar mean ages in years, for the males and the females in the total sample ( $M = 63.66$  males,  $M = 63.28$  females), the pre-discharge period ( $M = 63.00$  males,  $M = 62.52$  females), and the post-discharge period ( $M = 64.40$  males,  $M = 64.13$  females).

##### *Level of Education*

Overall, the majority of participants had completed high school or less. In the total sample and at both pre-discharge and post-discharge periods, more females than males completed high school or less (see Table 1, 2, & 3). Also, overall, more males reported having an education level beyond high school. However, no statistical differences were detected between males and females in highest level of education completed in the total sample ( $\chi^2(1) =$



1.60,  $p = .206$ ), and both pre-discharge ( $\chi^2(1) = 3.21$ ,  $p = .073$ ) and post-discharge periods ( $\chi^2(1) = 1.22$ ,  $p = .269$ ). Similarly, a comparison of males in the pre-discharge and post-discharge periods revealed no significant differences in level of education ( $\chi^2(1) = 0.125$ ,  $p = .723$ ). No significant differences were also found in the level of education between females in the pre-discharge and post-discharge period ( $\chi^2(1) = 0.01$ ,  $p = .907$ ).

### *Marital Status*

In the total sample, more females than males reported their marital status as single, separated/divorced, or widowed (see Table 1). In the pre-discharge period, all of the males were married or cohabitating with a partner, while three females were single, separated/divorced, or widowed (see Table 2). In the post-discharge period, more males were married/cohabitating with a partner (see Table 3). Therefore, overall, more males were married or cohabitating with a partner in both pre-discharge and post-discharge periods, as well as in the total sample. However, a test for significance was not performed.

### *Clinical Characteristics*

#### *Total Sample*

For the total sample, the mean number of bypasses reported by males was 3.87 grafts ( $SD = 0.83$ ) and ranged from 3-6 grafts. Among the females, the mean number of bypasses reported was 3.09 grafts ( $SD = 0.64$ ) and ranged from 2-5 grafts.

Among the males, twenty-nine (90.6%) reported the presence of co-morbidities. The average number of co-morbidities reported was 2.78 (range = 0-8;  $SD = 1.85$ ). The top four reported co-morbidities were high cholesterol ( $n = 17$ ; 53.1%), high blood pressure ( $n = 17$ ; 53.1%), diabetes ( $n = 15$ ; 46.9%) and arthritis and gout tied for fourth ( $n = 4$ ; 12.5%).

Table 1

*Demographic Characteristics of the Total Sample (n = 32 males, n = 32 females)*

Age	Mean	Standard Deviation		Range	
	(Years)		(SD)	Min	Max
Males	63.66		8.89	48	79
Females	63.28		10.49	41	84
Highest Level of Education	Frequency			Percent (%)	
	Males	Females		Males	Females
High school or less	16	21		50.0	65.6
Trade school to college/university	16	11		50.0	34.4
Marital Status	Frequency			Percent (%)	
	Males	Females		Males	Females
Single	1	2		3.1	6.3
Separated/Divorced	0	1		0.0	3.1
Widowed	0	5		0.0	15.6
Married/Co-habiting	31	24		96.9	75.0

Table 2

*Demographic Characteristics of the Sample in Pre-Discharge Period (n =17 males, 17 females)*

Age	Mean	Standard Deviation		Range	
	(Years)		(SD)	Min	Max
Males	63.00		8.77	48	79
Females	62.52		10.92	41	84

Highest Level of Education	Frequency		Percent (%)	
	Males	Females	Males	Females
Some high school or less	9	11	52.9	64.7
Trade school to college/university	8	6	47.1	35.3

Marital Status	Frequency		Percent (%)	
	Males	Females	Males	Females
Single	0	1	0.0	5.9
Separated/Divorced	0	1	0.0	5.9
Widowed	0	1	0.0	5.9
Married/Co-habiting	17	14	100.0	82.4

Table 3

*Demographic Characteristics of Sample in Post-Discharge Period (n = 15 males, 15 females)*

Age	Mean	Standard Deviation		Range	
	(Years)	(SD)		Min	Max
Males	64.40	9.25		49	78
Females	64.13	10.30		46	82
Highest Level of Education	Frequency		Percent (%)		
	Males	Females	Males	Females	
Some high school or less	7	10	46.7	66.7	
Trade school to college/university	8	5	53.3	33.3	
Marital Status	Frequency		Percent (%)		
	Males	Females	Males	Females	
Single	1	1	6.7	6.7	
Separated/Divorced	0	0	0.0	0.0	
Widowed	0	4	0.0	26.6	
Married/Co-habiting	14	10	93.3	66.7	

Among the females, 31 (96.9%) reported the presence of co-morbidities with high cholesterol (n = 23; 71.9%) reported the most frequently, followed by high blood pressure (n = 22; 68.8%), diabetes (n = 15; 46.9%), and arthritis (n = 13; 40.6%). The average number of co-morbidities reported was 3.46 (range = 0-8; SD = 2.01).

No significant differences were found in comparing the mean number of co-morbidities between males and females in the total sample ( $t(62) = 1.423$ ,  $p = .160$ ). In addition, no statistically significant differences were found in comparing the number of males and females who reported high blood pressure ( $\chi^2(1) = 0.556$ ,  $p = .456$ ) and high cholesterol ( $\chi^2(1) = 3.21$ ,  $p = .073$ ).

#### *Pre-Discharge Period*

In the pre-discharge period, the mean number of bypasses for males was 3.94 (SD = 0.75), ranging from 3 to 5 grafts. The mean number of bypasses for females was 3.12 (SD = 0.60), ranging from 2 to 5 grafts.

Fourteen (93.3%) of males in the pre-discharge period reported the presence of co-morbidities. The average number of co-morbidities reported was 2.76 (range = 0-8; SD = 1.79). The top four reported co-morbidities reported were high cholesterol (n = 11; 64.7%), diabetes (n = 10; 58.8%), high blood pressure (n = 9; 52.9%), and gout (n = 4; 23.5%). Among the females, seventeen (100%) reported the presence of co-morbidities, with 3.29 as the average number reported (range = 0-8; SD = 1.72). High cholesterol and high blood pressure were reported the most frequently (n = 13; 76.5%) followed by diabetes (n = 10; 58.8%), and arthritis (n = 5; 29.4%).

Similar to the results of the total sample, no significant differences were detected in the number of co-morbidities as reported by males and females in the pre-discharge period ( $t(32) = 0.879, p = .386$ ).

#### *Post-Discharge Period*

In the post-discharge period, the mean number of bypasses for males was 3.80 (SD = 0.94), ranging from 3-6 grafts. The mean number of bypasses was 3.07 (SD = 0.70) for the females, ranging from 2-5 grafts.

Among the males and females, only one (6.7%) in each gender category reported no co-morbidities. The average number of co-morbidities reported among the males was 2.80 (range = 0-8; SD = 2.31).

The top four reported co-morbidities among the males was high blood pressure ( $n = 8$ ; 53.3%), high cholesterol ( $n = 6$ ; 40.0%), diabetes ( $n = 5$ ; 33.3%), and musculoskeletal disease and renal impairment tied for fourth ( $n = 4$ ; 26.7%). In the female group, the mean number reported of co-morbidities was 3.67 (range = 0-8; SD = 2.02). High blood pressure and high cholesterol were tied for the top most reported co-morbidity ( $n = 10$ ; 66.7%), followed by arthritis ( $n = 8$ ; 53.3%), visual impairment ( $n = 6$ ; 40.0%), and diabetes ( $n = 5$ , 33.3%).

Similar to the pre-discharge period and in the total sample, no significant differences were found in the number of co-morbidities by gender in the post-discharge period ( $t(28) = 1.094, p = .2830$ ).

## Gender and Learning Needs

### *Patient Learning Needs Scale*

#### *Total Sample*

For the total sample, the mean overall PLNS scores were slightly higher among males in comparison to the females ( $M = 35.47$  males,  $M = 33.03$  females). Generally, males also reported slightly higher mean scores on the instrument subscales (see Table 4).

#### *Pre-Discharge Period*

Overall scores for the PLNS for the pre-discharge period revealed a slightly broader range and a slightly higher mean for the female sample (see Table 5). Further division of the subscale to combine the mean scores of only the two items pertaining to psychosocial functioning also yielded a slightly higher mean score among the females.

When the 13 PLNS items were organized according to mean scores, the top five items with the highest scores among males and females were identical but differed in order (see Table 6). Males perceived the two items pertaining to complications as first and second most important while females perceived the two items pertaining to complications as tied for second as most important. Males perceived the one item relating to activities of living as third most important, whereas females scored the item as most important. Also, the two learning needs regarding psychosocial functioning (items number 12 and 13) were perceived similarly by males and by females as third and fourth least important. The item relating to medications was seen as sixth most important for males, while it was perceived as eighth most important by females. On items pertaining to symptoms, males and females scored items related to the management and prevention of edema, constipation, and chest/incision pain in their top five most important learning needs.

Table 4

*PLNS: Range of Scores and Measures of Central Tendency in Total Sample*

PLNS (Number of Items)	Mean	Standard Deviation	Observed Range		Possible Range	
			Min	Max	Min	Max
<hr/>						
Complications (2)						
Males	7.09	3.27	2	10	2	10
Females	6.12	3.76	2	10	2	10
Activities of Living (1)						
Males	3.53	1.61	1	5	1	5
Females	3.13	1.88	1	5	1	5
Medication Management (1)						
Males	2.44	1.37	1	5	1	5
Females	2.19	1.51	1	5	1	5
Symptom Control (9)						
Males	22.41	9.76	9	39	9	45
Females	21.59	11.43	9	45	9	45
Total Scale (13)						
Males	35.47	13.88	13	57	13	65
Females	33.03	16.25	13	65	13	65



Table 5

*PLNS: Range of Scores and Measures of Central Tendency in Pre-Discharge Period*

PLNS (Number of Items)	Mean	Standard Deviation	Observed Range		Possible Range	
			Min	Max	Min	Max
<b>Complications (2)</b>						
Males	7.71	2.95	2	10	2	10
Females	7.41	3.45	2	10	2	10
<b>Activities of Living (1)</b>						
Males	3.47	1.74	1	5	1	5
Females	3.82	1.67	1	5	1	5
<b>Medication Management (1)</b>						
Males	2.35	1.41	1	5	1	5
Females	2.47	1.59	1	5	1	5
<b>Symptom Control (9)</b>						
Males	21.59	9.10	9	45	9	45
Females	24.41	11.36	9	45	9	45
<b>Items related to psychosocial functioning (2)</b>						
Males	4.29	2.73	2	10	2	10
Females	4.82	3.17	2	10	2	10
<b>Total Scale (13)</b>						
Males	35.12	12.77	13	53	13	65
Females	38.12	15.53	13	65	13	65

Table 6

*PLNS: Item Mean Scores in Order of Importance (Lowest to Highest) in Pre-Discharge Period*

Males		Females	
Item (Item # on PLNS)	Mean Score	Item (Item # on PLNS)	Mean Score
Fatigue/Tired (8)	1.89	Vomiting (7)	2.06
Sleep (9)	2.06	Fatigue/Tired (8)	2.29
Manage emotions (13)	2.12	Anxious/Down (12)	2.41
Anxious/Down (12)	2.18	Manage emotions (13)	2.41
Vomiting (7)	2.23	Manage medications (4)	2.47
Nausea (6)	2.35	Nausea (6)	2.53
Manage medications (4)	2.35	Sleep (9)	2.76
Manage chest/incision pain (5)	2.88	Manage chest/incision pain (5)	2.94
Constipation (10)	2.94	Constipation (10)	3.35
Edema (11)	2.94	Edema (11)	3.59
Physical activities (3)	3.47	Recognize complications (3)	3.71
Recognize complications (1)	3.82	Decrease/avoid complications (2)	3.71
Decrease/avoid complications (2)	3.88	Physical activities (3)	3.82

*Note.* # - Number. Items displayed in table are a shortened version of items in the PLNS (see Appendix A).

### *Post-Discharge Period*

In the post-discharge period, the mean of the overall scores for the PLNS was higher among males compared to the females (see Table 7). A comparison of the means of the individual subscale scores also revealed that males scored consistently higher than the females in all the subscales. Furthermore, a combined score of items relating to psychosocial functioning generated a higher mean score for males than females.

Males and females perceived items pertaining to preventing the onset of edema as most important (see Table 8). However, the mean scores pertaining to this item differed. Similar to the pre-discharge period, the top five most important items with the highest mean scores were identical among males and females but differed in means and in order. In the item pertaining to medications, females perceived the learning need as sixth most important while the males rated the item as eighth most important. In the two items pertaining to psychosocial functioning, males perceived them as sixth and seventh, while females scored the items as tied for sixth most important. Items pertaining to fatigue/tiredness, management of vomiting, and management of nausea were perceived as the three least important learning needs by both gender groups.

Table 7

*PLNS: Range of Scores and Measures of Central Tendency in Post-Discharge Period*

PLNS (Number of Items)	Mean	Standard Deviation	Observed Range		Possible Range	
			Min	Max	Min	Max
Complications (2)						
Males	6.40	3.56	2	10	2	10
Females	4.67	3.68	2	10	2	10
Activities of Living (1)						
Males	3.60	1.50	1	5	1	5
Females	2.33	1.84	1	5	1	5
Medication Management (1)						
Males	2.53	1.36	1	5	1	5
Females	1.87	1.41	1	5	1	5
Symptom Control (9)						
Males	23.33	10.71	9	39	9	45
Females	18.40	11.02	9	41	9	45
Items related to psychosocial functioning (2)						
Males	5.27	2.99	2	10	2	10
Females	3.73	2.81	2	10	2	10
Total Scale (13):						
Males	35.87	15.50	13	57	13	65
Females	27.27	15.57	13	61	13	65

Table 8

*PLNS: Item Mean Scores in Order of Importance (Lowest to Highest) in Post-Discharge Period*

Males		Females	
Item (Item # on PLNS)	Mean Score	Item (Item # on PLNS)	Mean Score
Nausea (6)	2.13	Nausea (6)	1.60
Vomiting (7)	2.13	Vomiting (7)	1.67
Fatigue/Tired (8)	2.20	Fatigue/Tired (8)	1.73
Sleep (9)	2.20	Manage medications (4)	1.87
Manage medications (4)	2.53	Anxious/Down (12)	1.87
Manage emotions (13)	2.60	Manage emotions (13)	1.87
Anxious/Down (12)	2.67	Sleep (9)	2.20
Constipation (10)	2.80	Constipation (10)	2.20
Manage chest/incision pain (5)	2.87	Recognize complications (1)	2.33
Recognize complications (1)	3.20	Decrease/avoid complications (2)	2.33
Decrease/avoid complications (2)	3.20	Physical activities (3)	2.33
Physical activities (3)	3.60	Manage chest/incision pain (5)	2.53
Edema (11)	3.73	Edema (11)	2.73

*Note.* # - Number. Items displayed in table are a shortened version of items in the PLNS (see Appendix A).

## Hypothesis Testing

*Hypothesis #1: There will be a significant difference in the perceived overall importance of learning needs for information identified by male and female CABG surgery patients. Specifically, the perceived importance of learning needs for information will be significantly higher among females.*

There were no significant differences detected in the perceived overall learning needs for information for males and females in the total sample ( $t(62) = -0.645, p = .521$ ). Therefore, this hypothesis was not supported.

*Hypothesis #2: There will be a significant difference in the type of learning needs identified by male and female CABG surgery patients in the 24-48 hour pre-discharge period.*

No statistically significant gender differences were found in scores on any of the subscales of the PLNS. Therefore, males and females did not differ significantly on the type of learning needs for self-care in the 24 to 48 hours pre-discharge period (see Table 9).

*Hypothesis #3: There will be a significant gender difference in the type of learning needs in the area of psychosocial functioning identified by male and female CABG surgery patients in the 24-48 hour pre-discharge period. Specifically, females will report more learning needs related to psychosocial functioning than males.*

This hypothesis was not supported and no statistically significant gender differences were detected ( $t(32) = 0.52, p = .302$ ). Therefore, females and males did not differ significantly in their learning needs pertaining to the area of psychosocial functioning.

*Hypothesis #4: There will be a significant difference in the perceived overall importance of learning needs for information identified by male and female CABG surgery patients in the 24-48 hour pre-discharge period.*

No statistically significant gender differences were found in the overall perception of the importance of learning needs for self-care in the 24 to 48 hours pre-discharge period ( $t(32) = 0.62, p = .543$ ).

Table 9

*PLNS: T-Test Results by Gender in Pre-Discharge and Post Discharge Periods*

PLNS	Pre-Discharge Period	Post-Discharge Period
Subscale:		
Complications	$t(32) = -0.2, p = .791$	$t(28) = -1.31, p = .200$
Activities of Living	$t(32) = 0.61, p = .550$	$t(28) = -2.17, p = .048)^*$
Medications	$t(32) = 0.23, p = .821$	$t(28) = -1.32, p = .197$
Symptom Control	$t(32) = 0.80, p = .430$	$t(28) = -1.24, p = .224$
Psychosocial functioning	$t(32) = 0.52, p = .302)^a$	$t(28) = -1.45, p = .079)^a$
Total PLNS	$t(32) = 0.62, p = .543$	$t(28) = -1.52, p = .071)^a$

*Note.* <sup>a</sup> – Significance (one-tailed). \* $p < .05$ .

*Hypothesis #5: There will be a statistically significant gender difference in the rank ordering of learning needs identified by male and female CABG surgery patients in the 24-48 hour pre-discharge period.*

Mean item scores on the PLNS were ranked in order of importance (see Table 10). Contrary to the hypothesis, no statistically significant differences were detected in the rank ordering of learning needs by gender ( $U = 64.0, p = .292$ ).

*Hypothesis #6: There will be a significant difference in the type of learning needs identified by male and female CABG surgery patients in the 24-48 hour post-discharge period.*

No significant gender differences were found in comparing the means of the subscales of Complications, Medications, and Symptom Control (see Table 9). On the other hand, a significant gender difference was found in Activities of Living where the mean score was higher among males than females ( $t(28) = -2.17, p = .048$ ).

*Hypothesis #7: There will be a significant gender difference in the type of learning needs in the area of psychosocial functioning identified by male and female CABG surgery patients in the 24-48 hour post-discharge period. Specifically, females will report more learning needs related to psychosocial functioning than males.*

There were no significant gender differences psychosocial learning needs reported in the post-discharge period ( $t(28) = -1.45, p = .079$ ). Contrary to the hypothesis, females did not report more learning needs related to psychosocial functioning than males. Surprisingly, although not significant, the mean scores of the males were higher than the females (see Table 7), suggesting that males perceived this learning need as more important.

*Hypothesis #8: There will be a significant difference in the perceived overall importance of learning needs for information identified by male and female CABG surgery patients in the 24-48 hour post-discharge period. Specifically, the perceived importance of learning needs for information will be significantly higher among females.*

No significant gender differences were found in the perceived overall importance of learning needs for information in the post-discharge period ( $t(28) = -1.52, p = .071$ ). Contrary to the hypothesis, although not significant, mean overall PLNS scores were higher among males.



Table 10

*PLNS: Ranking of Items by Mean Scores (Lowest to Highest) in Pre-Discharge Period*

Rank	Item (Item # on PLNS)	Gender	Mean Score (PLNS)
1.0	Fatigue/Tired (8)	Male	1.89
2.5	Sleep (9)	Male	2.06
2.5	Vomiting (7)	Female	2.06
4.0	Manage emotions (13)	Male	2.12
5.0	Anxious/Down (12)	Male	2.18
6.0	Vomiting (7)	Male	2.23
7.0	Fatigue/Tired (8)	Female	2.29
8.5	Nausea (6)	Male	2.35
8.5	Manage medications (4)	Male	2.35
10.5	Anxious/Down (12)	Female	2.41
10.5	Manage emotions (13)	Female	2.41
12.0	Manage medications (4)	Female	2.47
13.0	Nausea (6)	Female	2.53
14.0	Sleep (9)	Female	2.76
15.0	Manage chest/incision pain (5)	Male	2.88
17.0	Constipation (10)	Male	2.94
17.0	Edema (11)	Male	2.94
17.0	Manage chest/incision pain (5)	Female	2.94

19.0	Constipation (10)	Female	3.35
20.0	Physical activities (3)	Male	3.47
21.0	Edema (11)	Female	3.59
22.5	Recognize complications (1)	Female	3.71
22.5	Decrease/Avoid complications (2)	Female	3.71
24.5	Physical activities (3)	Female	3.82
24.5	Recognize complications (1)	Male	3.82
26.0	Decrease/Avoid complications (2)	Male	3.88

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*Note.* # - Number. Items displayed in table are a shortened version of items in the PLNS (see Appendix A).

*Hypothesis #9: There will be a statistically significant gender difference in the rank ordering of learning needs identified by male and female CABG surgery patients in the 24-48 hour post-discharge period.*

Ranking the items by mean scores revealed that the top six scores were associated with the male gender. Also, it was observed that the lowest six mean scores were associated with the female gender (see Table 11). This indicated that almost half of the item scores belonging to the females were ranked lower than the lowest score associated with the male gender. Close to half of the male item scores were also ranked higher than the highest female item score. This rank ordering of items on the PLNS in the post-discharge period revealed a statistically significant gender difference ( $U = 29.5$ ,  $p = .005$ ). Therefore, the proposed hypothesis was supported.

Table 11

*PLNS: Ranking of Items by Mean Scores (Lowest to Highest) in Post-Discharge Period*

Rank	Item (Item # on PLNS)	Gender	Mean Score (PLNS)
1.0	Nausea (6)	Female	1.60
2.0	Vomiting (7)	Female	1.67
3.0	Fatigue/Tired (8)	Female	1.73
5.0	Manage medications (4)	Female	1.87
5.0	Anxious/Down (12)	Female	1.87
5.0	Manage emotions (13)	Female	1.87
7.5	Nausea(6)	Male	2.13
7.5	Vomiting (7)	Male	2.13
10.5	Sleep (9)	Female	2.20
10.5	Constipation (10)	Female	2.20
10.5	Fatigue/Tired (8)	Male	2.20
10.5	Sleep (9)	Male	2.20
14.0	Recognize complications (1)	Female	2.33
14.0	Decrease/Avoid complications (2)	Female	2.33
14.0	Physical activities (3)	Female	2.33
16.5	Manage chest/incision pain (5)	Female	2.53
16.5	Manage medications (4)	Male	2.53
18.0	Manage emotions (13)	Male	2.60

19.0	Anxious/Down (12)	Male	2.67
20.0	Edema (11)	Female	2.73
21.0	Constipation (10)	Male	2.80
22.0	Manage chest/incision pain (5)	Male	2.87
23.5	Recognize complications (1)	Male	3.20
23.5	Decrease/Avoid complications (2)	Male	3.20
25.0	Physical activities (3)	Male	3.60
26.0	Edema (11)	Male	3.73

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*Note.* # - Number. Items displayed in table are a shortened version of items in the PLNS (see Appendix A).

## CHAPTER VI: DISCUSSION

### Introduction

The following chapter begins with a discussion and comparison of the demographic and clinical characteristics of the sample with that of previous literature. This is followed by a discussion of the key findings as they related to each of the research hypotheses and the conceptual framework.

### Characteristics of the Sample

#### *Demographic Characteristics*

The creation of equal groups of males and females was purposefully performed to enhance equal representation for this gender analysis. However, this is unlike what can be found in literature that has described the prevalence of males and females undergoing CABG surgery where the number of males outnumbered females approximately four to one (Edwards et al., 2005; Guru et al., 2006).

Since age was used as a criterion for matching the sample of males and females, the mean ages of the males and females were very similar in the current study. However, literature that has described the profiles of CABG patients has consistently reported significant age differences between males and females. For example, in Guru et al. (2006), authors indicated that significantly more males than females were under the age of 60. On the other hand, Guru et al. also reported that more females than males were older than 70 years of age. Similarly, Edwards et al. (2005) reported that significantly more females than males underwent CABG surgery over the age of 65 years. Thus, the age profiles of the males and females undergoing CABG surgery for the sample in the current study are unlike what can be found in literature that have examined

the profiles of CABG patients. This, however, can be attributable in the sampling method where age was used as a matching criterion.

When comparing for differences in marital status, Jickling and Graydon (1997) reported that 80% of the males and 75% of the females were married. However, although the percentage of females who were married was similar to that of Jickling and Graydon (75%), the percentage of males was slightly higher at 96.9% compared to 75.0% of females for the total sample in the current study. This meant that there were more males ( $n = 31$ ) who were married than females ( $n = 24$ ) and is comparable to literature that has compared the profiles of CABG males and females (Ayanian, et. al., 1995; Edwards et al., 2005; Guru et al., 2006; Vaccarino et al., 2003). Therefore, the marital status of males and females in the current sample was found to be consistent with previous literature that has described the typical profiles of females undergoing CABG surgery (Fleury & Cameron-Go, 1997; King et al., 1992; Sarpy et al., 2000). A chi square analysis to test for the significance of this difference, however, was not performed given the relatively low number of frequencies observed.

Lastly, in the current study, more females reported completing high school or less in the total sample and in both pre and post discharge periods. Similarly, more males completed trade school/on-the-job training or some college/university. These, however, were not found to be statistically significant and comparable to Jickling and Graydon (1997) and Kattainen et al., (2004) who found no gender differences in level of education by gender. This suggests that any significant differences found may be more attributable to one's gender rather than in one's level of education. This, however, is unlike Vaccarino et al. (2003) where females undergoing CABG surgery were found to be significantly less educated than their male counterparts.

### *Clinical Characteristics*

A comparison of the presence of co-morbidities reported revealed that the presence of co-morbidities was relatively similar between the females and males. However, when comparing the average number of co-morbidities, females tended to report a higher number than males in the total sample ( $M = 3.46$  females;  $M = 2.78$  males), pre-discharge ( $M = 3.29$  females;  $M = 2.76$  males), and post-discharge periods ( $M = 3.67$  females;  $M = 2.80$  males). Although a t-test for independent samples revealed that these differences were not statistically significant, a trend can be observed where females consistently reported higher mean numbers than males. This is comparable to the sample described in Jickling and Graydon (1997) who reported no significant differences in the number of concurrent illnesses by gender.

There were no significant differences in the number of males and females who reported the presence of high blood pressure and high cholesterol in the total sample. However, a more careful examination of the number of males and females who reported the presence of high blood pressure and high cholesterol in the total sample and both pre and post discharge periods consistently revealed that more females than males reported the presence of these co-morbidities. This is noteworthy in that these co-morbidities are known risk factors of CHD and have been suggested to place patients at a higher post-operative risk and influence their recovery after CABG surgery (Ayanian et al., 1995; Guru et al., 2006; Vaccarino et al., 2006; Williams et al., 2000). The trend in higher number of co-morbidities observed among the females is consistent with the literature that has examined the pre-operative profiles of CABG patients (Ayanian et al., 1995; Eastwood & Doering, 2005; Edwards et al., 2003; Guru et al., 2006; Vaccarino et al., 2006; Williams et al., 2000).

In the current study, the presence of diabetes was another criterion used in selecting the sample. Therefore, there were equal numbers of males and females who had diabetes in the sample. However, comparisons of the incidence of diabetes among CABG patients in the literature revealed that significantly more females were likely to have diabetes prior to surgery (Eastwood & Doering, 2003; Edwards et al., 2005; Guru et al., 2006). Therefore, a lack of gender difference in the presence of diabetes in the current study decreases the representativeness of the sample in comparison to the typical profiles of males and females undergoing CABG surgery. However, matching for this clinical characteristic was performed so that any differences in learning needs found may be more attributable to gender than the presence of diabetes.

#### Gender and Learning Needs

According to the conceptual framework, the complex connections between the social and the biological characteristics that comprise a person's self-representation of gender can influence the critical self-appraisal process in making decisions about his or her health. In particular, the choice to place more importance on specific types of information and the identification of learning needs is largely influenced and 'constrained' by biology and the broader social context in which males and females are embedded (Rieker & Bird, 2005). This section will begin by summarizing the key findings of the current study. This is followed by a comparison of the key findings with that of literature and a discussion of potential explanations.



### *Key Findings*

The key findings of the current study can be summarized as follows:

1. There were no significant differences detected in the perceived overall importance of learning needs on the PLNS as identified by the male and female CABG patients in the total sample, and in both pre and post discharge periods.
2. A statistically significant gender difference in the type of learning needs was found only in the post-discharge period. This gender difference was attributed to males significantly needing more information than females in the learning need pertaining to Activities of Living.
3. Gender was found not to influence the type of learning needs related to psychosocial functioning prior to and after discharge.
4. A statistically significant gender difference in the rank ordering of learning needs was found only in the post-discharge period.
5. The timing of when the learning needs were appraised by the CABG patients was crucial in detecting significant gender differences.

### *Overall Learning Needs*

A comparison of the overall PLNS scores by gender revealed that there were no significant differences in the perceived overall importance of learning needs for information between males and females in the total sample. This is contrary to the hypothesis and findings of literature that reported females having significantly more overall learning needs among ICE patients (Stewart et al., 2004), as found in patients after hip arthroplasty (Johansson et al., 2004), and among and general medical and surgical patients (Bubela et al., 1990a). In addition, even though the range of overall PLNS scores were observed to be slightly broader for females, the

mean overall PLNS score was greater for males. This meant that, although the range of scores was higher among the females, more males on average reported higher mean overall scores.

In the pre-discharge period, there were also no statistically significant differences found in the mean total PLNS scores by gender. These results are similar to the studies of Jickling and Graydon (1997), who reported no significant gender differences in the overall learning needs of CABG patients in the same time frame, and Grady et al. (1988) who assessed the learning needs of CABG patients 5-10 days after surgery. Furthermore, these results are unlike studies where females scored higher in their overall perception of the importance of their learning needs in the PLNS as found in a study of medical and surgical patients at the time of discharge (Bubela et al., 1990a), and in patients after hip arthroplasty (Johansson et al., 2004). Nevertheless, the results of the current study, in conjunction with the findings reported in Jickling and Graydon, suggest that there are no significant gender differences in the perceived overall importance of learning needs for information among patients after CABG surgery in the immediate period prior to discharge.

In the post-discharge period, a careful examination of the mean scores by subscales revealed that females consistently scored less than the males (see Table 9). This suggests that the learning needs relevant to each subscale were always perceived as more important by males than females. However, results of the t-test comparing the overall scores of the PLNS in the post-discharge period by gender revealed that these differences were not statistically significant. This finding differed from those of Stewart et al. (2004) who found that females after an ICE reported more overall learning needs at 6 months after discharge.

These findings suggests that male and female CABG patients do not differ significantly in their perceived overall importance of learning needs presented in the PLNS. Therefore, there

was no difference in how males and females perceived the overall importance of information related to all the four domains of self-care (i.e. Medication Management, Symptom Control, Activities of Living, and Postoperative Complications) at the time of discharge after CABG surgery. Nevertheless, one potential explanation for a lack of significance in the findings may be related to the sampling method used. In the current study, matching for age and the presence of diabetes yielded a sample that was very similar in these characteristics. In addition, there were no significant gender differences in level of education in the total sample. However, perhaps it is the differences found in characteristics of age, level of education, and the presence of co-morbidities (i.e. diabetes) as reported in observations of CABG patients that influence their learning needs rather than gender. For example, an examination of the samples in studies that have detected gender differences in the overall learning needs of other patients revealed that there were significant gender differences in these characteristics (Bubela et al., 1990a; Johansson et al, 2000; Stewart et al., 2004). Thus, perhaps it may be the differences in these characteristics, rather than gender, which can influence the learning needs of male and female patients. However, further examination and research may shed some light into whether there are statistically significant in the overall perception of the importance of learning needs for information between males and females at the time of discharge.

### *Type of Learning Needs*

In the current study there were no statistically significant differences in the type of learning needs when comparing the mean scores of each PLNS subscale reported by gender in the pre-discharge period. This suggests that males and females reported similar learning needs before going home. This is consistent with Jickling and Graydon (1997) and Grady et al. (1988)

who both found that males and females have similar learning needs after CABG surgery prior to discharge.

However, results of the t-test comparing the total scores of the PLNS in the post-discharge period by gender revealed only the difference in the mean scores pertaining to the subscale of Activities of Living was statistically significant. Also, looking back at the mean scores on the PLNS, it can be observed that female scores ( $M = 2.33$ ) were less than the male scores ( $M = 3.60$ ) in this subscale. This suggests that males required more information than females in areas related to the resumption of activities after CABG surgery. Looking back at the clinical characteristics of the sample, it was found that consistently more females reported the presence of co-morbid illnesses. In addition, a trend can be found in the higher numbers of females who had high cholesterol and high blood pressure in the total sample and both pre and post discharge periods. In addition, literature that has looked at gender differences in the post-operative profiles patients revealed that females have fewer social supports than males after CABG surgery (King, 2000; King & Koop, 1999). According to the conceptual framework, these social and biological influences can potentially influence the choices one may make when making decisions about his or her health. For example, these influences may have played a part when the learning needs were assessed immediately after discharge where differences were detected. In Moore (1995), females expressed that not having a significant other to walk with them appeared to have influenced activity resumption after CABG surgery. Thus, the interplay of the biological influences (e.g. presence of more co-morbid conditions) and social influences (e.g. less social support) at home may compromise the ability of females to be functionally active after CABG surgery and influence their perceptions of their ability to resume physical activities. This is also consistent with literature that has reported females to be less able to perform

activities of daily living after experiencing a cardiac event requiring CABG surgery (Fleury & Cameron-Go, 1997) and may help to explain why females perceived learning needs related to this area as less important than their male counterparts.

Although not significant, female scores were consistently lower in all the PLNS subscales post-discharge. Using the conceptual framework, one potential argument for this finding is that females' experiences are linked to how they may prioritize and make choices regarding their health (King & Arthur, 2003). For example, King and Arthur articulated that the socialization of females in our society promotes for them to hold and internalize an "other" orientation, or that females are socialized to value the well-being of others over their own. In a study by King and Gortner (1996), females admitted to delaying disease management to accommodate their family needs. Even after a health care crisis, females continue to provide care-giving responsibilities (i.e. providing home-based care to ailing husbands, family members, grandchildren) (King & Arthur). This "other" orientation may have perhaps influenced their focus on caring for themselves and may explain why they reported a lower perceived need to learn about health information for themselves. This may have then influenced the perception of females to place a lesser degree of importance on these learning needs compared to the males. Alternatively, another potential explanation may be attributed to gender differences in the perceptions and understanding regarding CHD as a result of views from society. Historically, CHD has been viewed as a disease of men (Miller & Grindel, 1999) that may influence a gendered perception of this disease. For example, Hawthorne (1994) found that females recovering after CABG surgery tended to view the experience as an inconvenience of aging. On the other hand, their male counterparts viewed it as a major life crisis (Hawthorne). According to the conceptual framework, a health threatening crisis can compel an individual to appraise the meaning of their

situation and seek related information. Therefore, perhaps gender differences in the perceived importance of learning needs related to all the subscales may be influenced by views held by our society and may explain why males reported needing more information related to all the subscales in the PLNS in this period.

Looking back at the combined mean scores of the two items pertaining to psychosocial functioning in the pre-discharge period revealed that the mean scores of males and females were very similar. Although this was not statistically significant, this result is unlike other studies that have found gender differences in learning needs related to psychosocial functioning of CABG patients (Grady et al., 1988; Kattainen et al., 2004). The lack of finding statistically significant gender differences in learning needs related to psychosocial functioning in the pre-discharge and post-discharge periods may perhaps be related to the factor of when the learning needs were assessed. Looking back at the combined mean scores of the two items pertaining to psychosocial functioning in the pre-discharge period revealed that the means of males and females were very similar. However, surprisingly, males had a higher mean score than the females in the post-discharge period. This, however, was not significant. According to the assumptions made in the conceptual framework, adults may not be willing to learn about a particular topic until they have appraised the outcomes of learning as meaningful. Perhaps the importance of information related to this area may not have been perceived as a high priority by CABG patients at the time of discharge in comparison to other time points. For example, literature that has detected gender differences in learning needs of CABG patients reported that this difference was found prior to CABG surgery (Kattainen et al.), and one to four weeks after surgery (Grady et al.). Therefore, in the context of the early recovery period after CABG surgery, findings of the study suggests

that the area of psychosocial functioning may not be perceived as important as other areas of self-care at the time of discharge.

### *Rank Ordering of Learning Needs*

An examination of the learning needs identified by the males and females in the pre-discharge period revealed slight differences in the rank ordering of the items as determined by the mean scores in the PLNS. A careful examination of the mean scores of items by gender illustrated that, even though the top five reported items were similar between males and females, they differed in order. Males rated items pertaining to complications as first and second most important, where females ranked them as second most important. The difference in the ordering of these items was similar to Jickling and Graydon (1997) where males rated items pertaining to activities as secondary to items pertaining to complications. Also, unlike Jickling and Graydon who found no gender differences in the order of importance between males and females, it was observed that females scored items relevant to physical activities as more important in comparison to items relevant to complications. In the current study, the scores of two items pertaining to emotional reactions and feelings were similar as eighth and ninth most important among males and tied for ninth among females. There were slight differences noted in the scores of the item related to medication management, which was scored as sixth most important by males, and scored as eighth most important by females. However, when the scores of the males and females were combined and ranked according to mean item scores, a Mann Whitney U test revealed that these differences were not statistically significant. This suggests that males and females rank learning needs similarly prior to discharge.

In the post-discharge period, the first two items that had the highest scores as most important among males and females were the learning needs relating to the prevention and

management of edema. However, a comparison of the mean scores between males and females pertaining to this item showed that females scored one point less than males. This suggests that, although both males and females reported learning needs relating to this area as most important, the perceived value of the importance of these items differed. Specifically, males scored consistently higher than the females in their perceived importance of this item. Furthermore, a comparison of the mean item scores in the post-discharge period revealed that, although the top five highest item scores were similar among males and females, they differed in means and order. The two items pertaining to complications were tied for third most important among males ( $M = 3.20$ ) and tied for fourth most important among the females ( $M = 2.33$ ). In comparison, the item pertaining to the management of chest and/or incision pain was rated as fourth by males ( $M = 2.87$ ) and third by females ( $M = 2.53$ ). This suggests that there were differences in the rank ordering of information identified by the males and females in the post-discharge period and is comparable to the findings of Ashton (1997) and Jaworski (2005) who found differences in the rank ordering of learning needs by gender in patients hospitalized with an MI. Unlike the previous studies, however, it was found that the differences in the rank ordering of these items were statistically significant as determined by a Mann Whitney U test in the current study.

Also, a careful examination of the ranking of the mean scores after discharge revealed that females consistently scored less than males on learning needs on items relating to symptoms and complications. In the literature, females have been consistently shown to have more-comorbid illnesses that may help to explain why they have a more difficult recovery period after CABG surgery (Edwards et al., 2005). Because of this, one may expect females to report more learning needs relating to the control of symptoms, medication management, and post-operative



complications. However, the results of this study revealed that the scores of males on these items were consistently higher than females. One possible explanation may lie in the biological differences between males and females that may potentially affect the representation of symptoms or onset of complications after CABG surgery and, thus, their perceptions of the importance of learning about these items. Alternatively, the traditional social roles females may hold or have held (e.g. caregiver to aging parents or an aging spouse) may have exposed them to caring for other individuals with CHD or the post-operative symptoms (e.g. nausea, fatigue) and complications associated with CABG surgery. Also, as previously discussed, perhaps the internal “other” orientation of females on valuing the health or well being of others may have affected their focus on their own health (King & Arthur, 2003). Thus, females may place a lesser degree of importance on these learning needs compared to the males. However, the paucity in the literature available related to gender differences relating to the perception of males and females relating to the physical symptoms and onset of complications in the immediate period after discharge warrants the need for further research in this area.

#### *Timing of Learning Needs Appraisal*

The results of the current study indicated that learning needs appraised by CABG patients at one time point may not be reflected in another. For example, the learning need related to the prevention and management of edema was rated as fourth most important among males and third most important among females in the pre-discharge period. On the other hand, immediately after discharge, males and females both rated information pertaining to the prevention and onset of edema as most important. In the hospital setting, healthcare providers may be performing interventions to prevent the swelling of the extremities, such as restricting the patient’s salt and fluid intake as well as elevating the extremities (Frantz & Walters, 2001). In the context of their

home environment, however, patients may not be closely monitoring their salt and water intake and may not be engaging in behaviors that can alleviate this symptom. The onset of edema can promote an individual to want to seek information related to the management of this symptom. Thus, this learning need may not have been perceived as important by participants until they had experienced increased swelling at home.

In the current study, significant gender differences were only detected in the immediate period after discharge. For example, gender differences in the rank ordering of learning needs were only observed in the immediate post-discharge period. On the contrary, as in Jickling and Graydon (1997), the learning needs of male and female CABG patients were similar in the immediate period pre-discharge period. Therefore, the perceived importance of information may be dependent on the context of one's situation that may be related to the setting and point in the CABG surgery recovery continuum. The complex connections between biological characteristics and social influences that influence the critical appraisal process to identify learning needs continually change. Perhaps gender differences are really more pronounced at other time points and settings (e.g. immediate post-discharge period) and may explain why gender differences were only detected in this period. Therefore, learning needs appraised by patients in the hospital prior to discharge after CABG surgery may not necessarily reflect their learning needs once they are at home.

### Summary

The method used in selecting the sample in the current study produced a sample of males and females that were very similar in age and had the same number of males and females who had diabetes. However, this is unlike what can be found in literature that has found gender differences among CABG patients in these areas. Further, the descriptive characteristics of the

sample related to marital status were comparable to those found in other research; where females were less likely to be married, and reported more co-morbidities than males. There were no significant differences in level of education by gender. Results of the current study revealed that in some instances gender played a role in influencing the learning needs of CABG patients. However, the detection of significant gender differences was dependent on the time of when learning needs were appraised by the individuals. Although small differences were noted in the pre-discharge period, significant differences were only detected in the immediate period after discharge. These were attributable to differences in the learning needs related to physical activities, where males reported needing significantly more information about physical activities than females, and in significant differences in the rank ordering of learning needs by gender. In keeping with the conceptual framework, the results of the study suggests that the complex connections between the social influences and the biological characteristics that comprise one's self-representation of their gender can affect the degree of importance males and females may place on their learning needs after CABG surgery. In addition, the timing of when learning needs were appraised by the individuals was crucial in detecting gender differences.

## CHAPTER VII: LIMITATIONS, STRENGTHS, IMPLICATIONS, AND CONCLUSION

### Introduction

The following chapter will begin with a presentation of the limitations and strengths of the current study. Implications of the current study for a) Patient Education, b) Nursing Research, and c) Theory will then be articulated and followed by a conclusion.

### Limitations

One limitation of the current study was that the total sample size was limited by the data available from the parent study. Specifically, the number of females who were included in each group limited the total sample size. The small sample size in each group may have decreased the chances of detecting significant differences. However, the researcher mitigated the limitation of a small sample size by matching for age and co-morbidity (diabetes) for each group. In addition, given the nature of this research of being a pilot study, an examination of gender differences in learning needs of CABG patients at discharge can help to inform future projects exploring the role of gender in patient education.

Due to the subjective nature of learning needs, only the individuals themselves can truly identify the types of information they would like to learn more about. Thus, the use of self-report forms was the most appropriate data collection strategy for obtaining such subjective information. However, one potential limitation is related to the participants' completion of these self-report forms. More specifically, misinterpretation of questions in a self-report form can adversely affect the validity of the results (Black, 1999). To avoid this, it is essential that participants are clear on how to complete the PLNS questionnaires (Burns & Grove, 2005). To reduce the misinterpretation of questions in the PLNS, the scale was administered over the

telephone in the parent study, which helped ensure that questions that were raised were answered by the researcher.

Another limitation of the study is related to the measurement of the independent variable of gender. Particularly, as the purpose of the parent study was not to examine gender differences, the data collection methods were not designed to specifically focus on this concept and operationalized gender in terms of the biological characteristic of sex only. As a result, other information about the sociological aspects of one's gender (e.g. roles, support, other social influences) were not available. Nevertheless, as previously discussed in Chapter III, the approach used to operationalize and measure gender based on the biological characteristic of sex was consistent with other literature that has examined the role of gender in influencing the learning needs of patients.

### Strengths

First, because only data from those who completed the PLNS questionnaire were eligible for inclusion in the secondary analysis, there were no issues related to the management of missing information. Second, the current study extracted data from the parent study that used a version of the PLNS that was specifically adapted for use with the sample of CABG patients. This is unlike Jickling and Graydon (1997) who used a version developed by Bubela et al. (1990b) for use with the general medical and surgical population. Thus, the use of a measure that was designed for a more general patient population may have decreased the validity of its use among CABG patients in comparison to one that may have been developed specifically for patients of this population (Burns & Grove, 2005). Third, the administration of the instrument by the researcher to the participants through the telephone in the parent study may have decreased any potential misinterpretations on how to answer the questions on the PLNS.

Finally, an internal reliability coefficient using Cronbach's  $\alpha$  yielded high levels of internal consistency for the PLNS and demonstrated reliability of the instrument.

### Implications

#### *Patient Education*

The findings of the current study suggest that gender may play a role in the appraisal of learning needs in the immediate post-discharge period after CABG surgery. Thus, nurses may need to be aware of the potential role of gender in influencing the learning needs of these patients in the planning and delivery of education programs. For example, in the post-discharge period, the findings suggest that males perceived information pertaining to physical activities as more important than females. Thus, males may be more receptive and willing to learn about information pertaining to the resumption of activities than females that, in turn, can enhance restoration of lung function and improve circulation after CABG surgery (Simani-Oren, 2003). Guided by the conceptual framework, to support a more gendered approach to the promotion of self-care among female CABG patients, nurses should be mindful of potential biological and/or social influences that can affect the appraisal of learning needs related to physical activities, such as perceived social support. Thus, one implication arising from the study findings is that when assessing learning needs, nurses should be aware that females may need some education on the importance of improving their physical activity levels. This can be supported through programs such as nurse-led peer networks for females recovering after CABG surgery and social programs that promote physical activity (e.g. group walking with peers and/or volunteers).

The timing of the appraisal played a crucial role in detecting gender differences in learning needs. Thus, learning needs identified prior to discharge may not necessarily reflect the learning needs of patients once they are at home and where they assume much of the

responsibility for their care. Addressing the learning needs of patients in areas related to self-care may affect the recovery of these vulnerable patients. The findings of the current study have the potential to shape the development of programs by highlighting that gender can be a factor in influencing the learning needs of CABG patients. In particular, gender differences were found in the post-discharge period. Therefore, another potential implication is for healthcare providers to be cognizant of potential gender differences in the learning needs of patients and to continue to assess and provide follow-up instructions to females and males *after* they are discharged from the hospital through a telephone intervention program or through home visits.

### *Nursing Research*

Although the current study examined the influence of gender on the learning needs of patients after CABG surgery, the parent study was not designed to specifically examine this concept. Thus, the current study is the first that primarily aimed to detect gender differences in the learning needs of CABG patients in the immediate period after discharge. In addition, matching for the demographic characteristic of age and clinical characteristic of the presence of diabetes helped to mitigate the small sample size in the current study. However, perhaps this sampling method may have been too selective and generalization of the results may be limited beyond the sample of the study. Therefore, the limitations of a small sample from a single-setting warrant the need for additional research in this area with a larger sample derived from multiple locations. Also, additional studies employing both quantitative and qualitative research methodologies can offer a broader perspective of the social and biological influences that may affect the learning needs of male and female CABG patients. For example, the use of structured self-report forms combined with unstructured interviews that can encourage males and females to elaborate on why they have rated some learning needs as more important than others. This

can shed some light into what social roles, relationships, responsibilities, and biological factors can influence the kind of information they may be looking for and, thus, the learning needs they may identify as more important. For example, do the traditional social roles females hold as caregivers really expose them to have cared for someone with CHD and, consequently, require less information about the self-care strategies relating to symptoms, complications, and management of medications associated with the post-discharge care after CABG surgery? Nevertheless, results of the current study add to the limited knowledge base of the role of gender in influencing the learning needs of CABG patients. Continued investigation of this area of research can then lead to the development of a more gendered approach to the education of these vulnerable patients.

### *Theoretical Implications*

The framework used in this study was adapted from the concepts found in Rieker and Bird (2005) and Redman (2001) to suggest that the complex biological and social connections that make up one's gender can influence the learning needs of CABG patients after discharge. However, the parent study was not designed to explicitly measure the social aspects of one's gender that may influence the appraisal of learning needs. Also, the interplay of potential biological and social factors associated with gender that may affect a person's need to seek out health information is an area that is not well examined in the literature. Therefore, to strengthen any assumptions that can be made related to the concepts and relationships reflected in the framework, further testing of the model is required. One approach to this can begin with extrapolating and testing relationships that can be derived from the framework to shed more light into what social and biological factors associated with gender can affect the appraisal of learning needs. For example, one relationship that can be tested is whether the presence of co-morbidities



and the likelihood that more females tend to be single/separated/divorced/widowed influences their perceived social support and, thus, the appraisal of their learning need to engage in physical activities after CABG surgery.

### Conclusion

Rieker and Bird's (2005) conceptualization of Constrained Choice combined with Redman's (2001) process of patient education formed the conceptual basis of this study and provided a theoretical explanation as to why the perceived importance of learning needs may have differed between male and female CABG patients after surgery. Also, the results of the study suggests that learning needs are context-specific and that the timing of when learning needs are appraised can be a crucial factor in detecting significant differences. Thus, the learning needs identified in the hospital may not necessarily reflect the learning needs of patients once they are at home.

Therefore, the current study is valuable in expanding the knowledge base about the role of gender differences in coronary health. Additional research in this relatively untouched area exploring the influence of gender on the learning needs of this vulnerable population can ultimately improve the development and delivery of patient education that can better facilitate their recovery after CABG surgery.

## Appendix A

### Demographic Questionnaire

1.) How old are you? \_\_\_\_\_

2.) Are you:            Male \_\_\_\_\_            Female \_\_\_\_\_

3.) What is your highest level of education that you have received?

- i.)     \_\_\_\_\_ some high school
- ii.)    \_\_\_\_\_ high school
- iii.)   \_\_\_\_\_ trade school
- iv.)    \_\_\_\_\_ on-the-job training
- v.)     \_\_\_\_\_ formal technical training
- vi.)    \_\_\_\_\_ some college/university
- vii.)   \_\_\_\_\_ college diploma
- viii.) \_\_\_\_\_ BS/BA/equivalent
- ix.)    \_\_\_\_\_ MS/MBA/equivalent
- x.)     \_\_\_\_\_ PhD

4.) Are you currently?

- 1.    \_\_\_\_\_ single
- 2.    \_\_\_\_\_ married/cohabitating
- 3.    \_\_\_\_\_ separated/divorced
- 4.    \_\_\_\_\_ widowed

5.) Number of bypasses: \_\_\_\_\_

6.) Do you have any other illnesses or conditions?

- 1. No    \_\_\_\_\_
- 2. Yes   \_\_\_\_\_

If yes, please specify:

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## Appendix B

### Patient Learning Needs Scale

Learning need item	Subscale	Not important	Slightly important	Moderately important	Very important	Extremely important
1.) How to recognize complications.	Complications	1	2	3	4	5
2.) How to decrease or avoid complications during post-operative recovery period.	Complications	1	2	3	4	5
3.) What are appropriate physical activities that should or can be performed during the first 3 weeks post-discharge.	Activities of Living	1	2	3	4	5
4.) What are different strategies for medication management.	Medication Management	1	2	3	4	5
5.) What to do if you experience chest and/or incision pain.	Symptom Control	1	2	3	4	5
6.) How to manage nausea (e.g.: sick to stomach).	Symptom Control	1	2	3	4	5
7.) How to manage vomiting (e.g. throw up).	Symptom Control	1	2	3	4	5
8.) What to do if you feel fatigue or tired.	Symptom Control	1	2	3	4	5
9.) What to do if you cannot sleep properly.	Symptom Control	1	2	3	4	5
10.) How to manage constipation.	Symptom Control - constipation	1	2	3	4	5
11.) How can you prevent/manage the onset of edema (e.g.: swelling).	Symptom Control	1	2	3	4	5
12.) Why do you feel this way (e.g. anxious/down).	Symptom Control – <i>psychosocial functioning</i>	1	2	3	4	5
13.) How to manage these emotional reactions.	Symptom Control – <i>psychosocial functioning</i>	1	2	3	4	5

*Note.* In the administration of the PLNS, participants were asked to rate the importance of each item in order to manage their care at home.

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