UNIVERSITY OF CALGARY

The Effect of a Professionally-Guided Telephone Peer Support Intervention on Early Recovery Outcomes in Men following Coronary Artery Bypass Graft Surgery

by

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FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled “The Effect of a Professionally-Guided Telephone Peer Support Intervention on Early Recovery Outcomes in Men following Coronary Artery Bypass Graft Surgery” submitted by Tracey J. F. Colella in partial fulfillment of the requirements for the degree of Doctor of Philosophy, Nursing.

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Abstract

Recovery from coronary artery bypass graft (CABG) surgery is a complex process involving physical recuperation and psychological adjustment. The high prevalence of postoperative depression in this population may threaten optimal recovery. Peer support over the recovery period has promise to mitigate this threat. The purpose of this study was to examine the effect of a professionally-guided telephone peer support intervention on recovery outcomes including depression, social support and health care resource utilization.

In a randomized controlled trial, 185 male CABG surgery patients randomly assigned to an intervention (n=61) or usual care (n=124) group. Participants in the intervention group received weekly telephone calls from a peer volunteer over 6 weeks post discharge. At hospital discharge and at 6 and 12 weeks follow up, depression was measured using the Beck Depression Scale-II, social support was measured using the Shortened Social Support Scale and health care resource utilization was measured using items in the Postoperative Self Report of Recovery Questionnaire. Participants in the intervention group were also asked questions about their perceptions regarding peer support using the Peer Support Evaluation Inventory.

Although a significant difference (p=0.05) was detected in depression scores at hospital discharge (participants in the control group had higher mean scores than those in the intervention group), there were no significant differences in depression scores at either 6 or 12 weeks post discharge (p=0.08; p=0.49, respectively) or in the changes in scores over time (F(2,553)=0.44, p=0.51). The groups did not differ significantly in changes in perceived social support scores over time (F(1,185)=0.005, p=0.94). However, at 12 weeks post
discharge, the control group had significantly greater utilization of health services (family physician visits, emergency room visits) than the intervention group \( (p=0.02; \ p=0.04 \) respectively). There was little effect of the intervention on the outcomes examined. However, given the potentially deleterious outcomes associated with depression in cardiac patients and the strong theoretical and empirical foundation regarding the positive influence of social support on health outcomes, healthcare providers will need to continue to investigate novel interventions (such as peer support) to enhance social support and reduce depression in cardiac patients.
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Dedication

To my family who have taught me to persevere no matter what, and to face challenges with faith, humility and love.

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CHAPTER ONE
INTRODUCTION

Coronary artery disease (CAD) affects millions of North Americans and continues to remain the leading cause of premature morbidity and mortality (Heart & Stroke Foundation of Canada, 2000; American Heart Association, 2003; Institute of Clinical Evaluative Sciences, 2002; Manuel et al., 2003). Over eight million, or one in three Canadians, are estimated to suffer from some form of CAD (HSFC, 2003). Although medical and surgical treatments can improve health outcomes, living with CAD can be psychologically overwhelming.

The cost and resource utilization associated with the treatment of this disease has a significant impact on both socialized and private health care systems (HSFC, 2003). Coronary artery bypass graft (CABG) surgery is one of the most costly and frequently performed procedures for coronary artery disease. More than 24,000 CABG surgery procedures are performed in Canada and 519,000 in the United States, respectively each year (AHA, 2004; HSFC, 2003).

Despite its frequency, CABG surgery is still perceived as a stressful, anxiety provoking, and sometimes overwhelming experience. Patients convalescing from CABG surgery undergo a recovery period associated with adverse psychological and physical functioning lasting up to six months following surgery or longer (Stewart, 1993). Healthcare reform initiatives aimed at reducing healthcare expenditures have resulted in earlier patient discharge from hospital and often less than adequate follow up post-cardiac surgery. Although length of stay (LOS) is directly related to cost, decreasing LOS may not be an effective strategy if potentially preventable complications occur and patient readmission rates
increase (Deaton et al., 1998). Given their earlier discharge, postoperative CABG surgery patients are particularly in need of information and support regarding recovery expectations in the early recuperative phase.

Recovery from CABG surgery is a complex process that involves not only physical recuperation but also psychological and social adjustment (Miller & Grindel, 2001). With a high prevalence (19% to 61%) of postoperative depression in this population, such additional stress may threaten effective coping as well as optimal recovery outcomes (Blumenthal et al., 2003; Burg et al., 2003a, 2003b; Pirraglia et al., 1999; Timberlake et al., 1997). In addition, patients with poor psychosocial adaptation after cardiac surgery may suffer from social isolation and poor compliance to treatment (medical and lifestyle) regimens. Numerous investigators have described that CABG patients consistently report inadequate preparation and support for the transition from hospital to home (Beckie, 1989; Bowles, 2000; Hamalainen et al., 2000). Escalating health care costs have necessitated that the health care industry provide more cost-effective services (Deber & Thompson, 1994). Yet, reduced expenditures have resulted in earlier discharge from hospital with little to no community support available for the home recovery needs of CABG surgery patients during this transition period. Inadequate discharge preparation coupled with a lack of follow up care places this population at great risk for prolonged psychosocial adjustment and potentially preventable complications, which may ultimately result in readmission to hospital (Bowles, 2000; Hartford & Wong, 2001). Thus, it is important to develop strategies to bridge the gap in the post-discharge care of cardiac surgery patients.
Previously published research has focused on nurse-initiated interventions and follow-up (Beckie, 1989; Hartford & Wong, 2001; Nicklin, 1986) for CABG surgery patients. Post-discharge nursing interventions have been found to facilitate psychological adjustment and recovery, as well as reduce anxiety and enhance coping. Despite these positive outcomes, many of the post-discharge interventions or programs have been abandoned due to healthcare restructuring; increased nursing workload, staff attrition; and a lack of economic or institutional support (Hartford & Wong, 2001; Hunt et al., 2000; Pengue et al., 1999).

Patients are particularly in need of information regarding recovery norms and expectations in the early recuperative phase. Redeker (1992) highlighted the importance of a social support structure for CABG surgery patients, noting that it was the most frequently used coping strategy during the first weeks of recovery. The importance of social relationships in the treatment of disease and the maintenance of health and well-being has drawn attention across a large number of behavioural science and health disciplines. Interventions designed to alter the social network and individual’s transactions within it have been successful in facilitating psychological adjustment, aiding in recovery from traumatic experiences, and even extending life for individuals with serious chronic disease (Cohen et al., 2000). Thus, it would be logical to assume that an individual who has successfully recovered from cardiac surgery may provide the necessary link or support to improve recovery outcomes (physiological and biopsychosocial), as well as facilitate earlier identification of postoperative complications. A peer support intervention merits great potential in facilitating patient recovery and rehabilitation post cardiac surgery. One-to-one
peer support interventions have the potential to not only impact patient satisfaction but also minimize related financial constraints placed on the health care system today.

Despite the large number of individuals recovering from CABG surgery, few investigators have examined factors related to one-to-one peer support and health outcomes in this population. Parent and Fortin (2000) undertook a randomized controlled trial (RCT) to examine the effectiveness of peer support in helping male patients cope with surgical anxiety, as well as improving self-efficacy expectations and self-reported activity. They found significantly higher levels of self-reported self-efficacy expectations (p<0.01) and activities in the experimental group. However, the small sample size and the underpowered nature of the study limit the generalizability of study findings. Further research, using an appropriately designed and powered RCT study design is required to accurately assess the effectiveness and timing of peer support interventions. Outcome measures should also include health status or recovery status, psychosocial measures and resource utilization (Hartford & Wong, 2001).

It is essential that further study regarding the effectiveness of a peer support intervention on health outcomes and discharge transition in the post-CABG surgery patient population be undertaken. Professional guidance (i.e. training and ongoing support provided by the acute care nurse practitioner (ACNP) investigator) of the peer support intervention is necessary in order to provide a mechanism for peers to obtain nursing support in situations identified beyond their scope of support. In addition, earlier referral for follow up care (to the nurse practitioner follow-up clinic) may positively affect the identification of postoperative complications, which in turn will impact postoperative morbidity and mortality rates.
Statement of the Problem

Cardiovascular diseases (of which coronary artery disease is a major element) have been identified as the underlying cause of death for one in three Canadians (HSFC, 2003). With their predicted increase over the next 20 years, the number of individuals undergoing coronary revascularization will continue to rise. Subsequently, there will be an exponential increase in the number of people requiring extensive treatment for this health problem in the future. The cost and resource utilization associated with the treatment of this disease has already had a tremendous impact on Canada's health care system. Within the context of an aging society, the ensuing health care burden is expected to intensify (HSFC, 2003; Hanayama et al., 2003).

The transition period after CABG surgery is one associated with intense physiological and psychosocial adjustment. With steadily decreasing hospital stays and dwindling post-discharge resources, patients and families are faced with greater responsibility for care at an earlier point in the recovery process.

A professionally-guided telephone peer support intervention may provide an effective approach to facilitate support and enhance psychosocial outcomes during the home-recovery transition. The importance of assessment of depression coupled with postoperative counselling and supportive intervention is key. Social support interventions have been positively associated with favourable psychosocial and physiological health outcomes in cardiac recovery (Beckie, 1989; Hartford & Wong, 2001; Meagher et al, 1987). The ability to identify those patients who may have difficulty adjusting after cardiac surgery would facilitate targeted peer intervention post-discharge. Not only would such assessment and intervention impact patient quality of life but potentially reduce medical and economic costs.
associated with readmission and treatment. The benefit of such an intervention for post-CABG surgery patients has not yet been clearly determined. Therefore, post-discharge recovery from cardiac surgery needs to be explored from the unique perspective of one-to-one peer support.

Specific Aims
The purpose of this study was to investigate the effectiveness of a professionally-guided peer support intervention on early recovery outcomes in post-CABG surgery patients.

Research Questions

*Primary Question*
What is the effect of a professionally-guided peer support intervention on early recovery outcomes in post-CABG surgery patients?

*Secondary Questions*
What is the effect of a professionally-guided peer support intervention on postoperative depression?
What is the effect of a professionally-guided peer support intervention on perceptions of recovery?
What is the effect of a professionally-guided peer support intervention on perceptions of social support?
What is the effect of a professionally-guided peer support intervention on health resource utilization following CABG surgery?
What are the perceptions of the participants who received the professionally-guided peer support intervention?
Definitions

- CABG surgery: first-time traditional coronary artery bypass graft surgery using a midline sternotomy approach. This was identified from the Health Record Audit (HRA) (King & Gortner, 1996).

- Peer support (a form of social support): support (informational, emotional and appraisal) in the form of like persons (i.e. age, gender) who have undergone CABG surgery with successful outcomes (post-recovery at least one year); peer support was provided over the telephone and was based on the peer’s previous experience as a cardiac surgery patient. Peer volunteers attended a 2-hour training session (included role overview, qualities, skills and expectations).

- Professionally-guided peer support: a cardiac acute care nurse practitioner (ACNP) was available to the peer volunteer/subject if an issue was identified that was beyond the scope of the peer volunteer.

- Depression: a disorder of mood characterized by sadness and loss of interest in usually satisfying activities, a negative view of the self and hopelessness, passivity, indecisiveness, suicidal ideations, loss of appetite, weight loss, sleep disturbances, and other physical symptoms (Beck et al., 1996). Some or all of these symptoms may be present, and depression can be categorized as mild, moderate, or severe/major according to scores measured on the Beck Depression Inventory II (BDI-II) (Diagnostic and Statistical Manual of Mental Health Disorders – Fourth Edition) (DSM-IV criteria).
• Perceptions of Recovery: recovery includes biophysical recovery, return to activity, and return to social roles; perceptions focused on the absence or resolution of physiological and/or psychosocial clinical symptoms (Tohen et al., 2000). (Perceptions of recovery were measured by the Postoperative Self-Report of Recovery Questionnaire (PSRRQ) (Gortner et al., 1994) over 12-weeks post-discharge.

• Social Support: any process through which social relationships may promote health and well-being (Cohen et al., 2000). Resources provided by others that can take the form of emotional support, instrumental aid, information, and positive feedback as to one’s importance, capabilities or self worth (Oermann, 1991). Social support was measured using the Shortened Social Support Scale (SSSS)(Funch et al., 1986).

• Health resource utilization: the consumption of health services (i.e. emergency room visits, regularly scheduled and unscheduled family physician visits and readmission to hospital) to meet health care needs as defined by the patient or the health care professional (Porter, 1998). This was measured by the number of health care visits/readmissions to hospital over 12-weeks post-discharge using the Postoperative Self Report of Recovery (PSRRQ).

• Perceptions of peer support: evaluation of the different aspects of peer support received (supportive interactions, relationship qualities, perceived benefits, satisfactions with support received) as measured by the Peer Support Evaluation Inventory (PSEI) (Dennis 2003b).
CHAPTER TWO
LITERATURE REVIEW

Coronary Artery Disease

Coronary artery disease remains the leading cause of morbidity and premature death in western societies (HSFC, 2003; AHA, 2004). The combination of unhealthy lifestyles and an aging society present an unfavourable profile for the development of CAD in future populations. Cardiovascular diseases (to which CAD is the major element) remain the major cause of hospitalizations for both men and women, and the most costly contributors to health costs in Canada (HSFC, 2000). Although medical and surgical treatment can clearly improve quality of life, reduce early death and impact health care delivery costs, living with heart disease can be psychologically overwhelming.

Depression and Coronary Artery Disease

Recently, studies have provided clear and convincing evidence that psychosocial factors contribute significantly to the pathogenesis of CAD (Ferketich et al., 2000; Gallacher et al., 2003; Wulsin & Singal, 2003). According to Rozanski et al. (1999), this evidence largely relates CAD risk to five specific psychosocial domains: 1) depression, 2) anxiety, 3) personality factors and character traits, 4) social isolation, and 5) chronic life stress. Behavioural risk factors including increased smoking, alcohol use and non-compliance have also been associated to depression (Glassman & Shapiro, 1998). Pignay-Demaria et al. (2003) identified that depression, anxiety or a combination of the two was linked to the risk of cardiovascular disease independent of classic coronary risk factors, both in patients with established CAD and in previously healthy individuals. In addition, depression has been found to be highly prevalent in patients with CAD, with up to 20% of patients evidencing
major depression and more than an additional 25% evidencing minor depression (Burg et al., 2003a; Carney, 2001; Sullivan et al., 2000). Not only has depression been linked to increased risk of CAD incidence in both men and women, but also to CAD mortality (Burg et al., 2003a).

A number of biological mechanisms have been proposed to explain the depression-related link to cardiac disease, including direct pathophysiological responses such as: neurohormonal changes, vascular endothelial dysfunction, platelet activation, and instability of myocardial excitatory properties (Carney, 2001; Musselman et al., 1996, 1998). Several investigators have suggested depressed patients experience heightened circulating catecholamines which trigger aggregation of platelets, release of inflammatory mediators, vasoconstriction and thrombus formation (Broadley et al., 2002; Lesperance & Frasure-Smith, 2000; Musselman et al., 1996; Rozanksi, 1999). The presence of depressive symptomatology has been associated with increased risk of mortality and continuing depression within the first year following hospital discharge post-MI (Lesperance & Frasure-Smith, 2000). Furthermore, numerous studies have demonstrated that the prognostic effect of depression is as large as, and independent of, other key prognostic factors, including ventricular dysfunction and severity of atherosclerosis (Ferketich et al., 2000; Frasure-Smith et al., 1995; Frasure-Smith et al., 1993; Lesperance et al., 1996; Lesperance et al., 2000).

According to Williams et al. (1999), the maintenance of emotional well-being is critical to cardiovascular health. Not surprisingly, depression, low perceived social support and other psychological factors have been implicated in the prognosis of patients undergoing CABG surgery (Burg et al., 2003a; ENRICHD, 2003; Pimm & Jude, 1990). The emotional, physiological and cognitive adaptation that occurs in preparing for and recovering from
CABG surgery puts this population at a heightened risk for depression before and after surgery.

*Coronary Artery Bypass Graft Surgery*

The expected long-term outcomes of any cardiac surgery are improved cardiac function and quality of life (Ben-Noun, 1999; Carey et al., 1992; Gortner et al., 1989; Lindsay et al., 2000; Steine et al., 1996). For most patients, CABG surgery has beneficial outcomes which include reduced symptoms of angina, dyspnea, as well as an increased sense of well-being. Yet, despite its frequency, CABG surgery is still perceived as a stressful and sometimes overwhelming experience (Deaton et al., 1998; Koivula et al., 2001; Miller & Grindel, 2001). Patients who survive CABG surgery undergo a recovery period associated with potentially adverse psychological and physical functioning, which can last up to 6 months or longer (Allen et al., 1990; Artinian, 1993; Hunt et al., 2000; Stewart, 1993). Even in the situation of an advantageous surgical outcome, some patients may not adapt to the profound changes in lifestyle, social relationships, and the process of rehabilitation.

At one time, patients undergoing CABG surgery typically returned home five to seven days post procedure (Artinian, 1993; Beggs et al., 1998; Goodman, 1997). However, widespread healthcare reform initiatives aimed at reducing healthcare expenditures have resulted in earlier patient discharges from hospital. Now, it is commonplace to have patients discharged at four to five days postoperatively. Although decreasing the LOS may initially reduce healthcare costs, it may not be an effective strategy if potentially preventable complications occur and patient readmission rates increase (Deaton et al., 1998).

Given the widespread practice of discharging postoperative CABG surgery patients in their early recuperative period, it is particularly important that information be provided
regarding appropriate expectations for recovery. Yet, over the last few decades, investigators (Anderson, Feleke & Perski, 1999; Artinian, 1993; Beckie, 1989; Bowles, 2000; Hamalainen et al., 2000; Knoll & Johnson, 2000; Nicklin, 1986; Tack & Gilliss, 1990) have continued to report that CABG surgery patients have inadequate preparation and support for the transition from hospital to home. Information regarding ‘norms’ for physical and psychological recovery (e.g., wound healing, activity progression, pain, sleep, depression, fatigue, anxiety), and information about cardiovascular disease itself, are most often lacking. In addition, patients have often been unsure of whom (e.g., which health care provider) they should access for what concerns during the early phases of recovery.

In addition to the trend toward early hospital discharge, the rising numbers of women, elders, and people of varying ethno-cultural affiliation undergoing CABG surgery, along with the increasing frequency of emergent and repeat procedures (Pashkow, 1993) have resulted in a great diversity of home recovery needs for CABG surgery patients. One third of all CABG surgeries in the United States are performed on patients older than 65 years of age (AHA, 2004). The number of women undergoing CABG surgery has steadily risen over the last decade (HSFC, 2003). Given the diversity and immediacy of the concerns that these patients may face, adequate support strategies are essential.

**Depression Before and After Cardiac Surgery**

Depression is considered a prevalent co-morbid condition in patients with CAD; between 27% and 47% in patients scheduled for heart surgery, and 19% to 61% after heart surgery (Burg et al., 2003b; Pirraglia et al., 1999). Predictors of postoperative depression may include poor social support, at least one stressful event during the last year, low level of education and moderate to severe dyspnea (Pirraglia et al., 1999). A high preoperative score
on the Beck Depression Inventory (BDI) was the best predictor of postoperative depression at 8 days, 8 weeks and 12 months follow up in one prospective study (Timberlake et al., 1997). Interestingly, these investigators also found an inverse relationship between the number of grafts performed and the incidence of clinical depression 8 days following surgery. The authors reported an association ($\chi^2 = 9.68, p < 0.08$) between depressed patients and fewer grafts. The variations evident in the course of depression over time further emphasizes the need to explore the most effective techniques to assist with individual coping after heart surgery.

Connerney et al. (2001) examined the association between depression and cardiac events (i.e. angina, heart failure requiring admission, myocardial infarction, cardiac arrest, percutaneous transluminal coronary angioplasty, repeat CABG and cardiac mortality) and non-cardiac events (i.e. all other reasons for mortality or readmission) in the 12 months following CABG surgery. Then, patients (207 men and 102 women) were assessed at hospital discharge and one-year post discharge. Depression was measured using the BDI and a semi-structured psychiatric interview (DSM-IV schedule). Depression was identified as an important independent risk factor for cardiac events post surgery; at 12 months 27% of these patients had a cardiac event (relative risk [RR] 2.3; CI 1.17-4.56), when compared with 10% of those who were not depressed ($p<0.0008$). Depression can be associated with cardiac events and mortality through pathways such as reduced compliance to medical regimen and necessary lifestyle modifications.

In a prospective study of 53 patients, Rymaszewska et al. (2003) identified that symptoms of depression were diagnosed in 32% of patients before surgery, 28.3% after surgery, and in 26.4% three months following surgery. Despite the lack of a comparison
group and the small sample size, their conclusions support the premise that preoperative depression reliably predicted the occurrence of depressive symptoms after surgery. Similarly, Burg et al. (2003b) identified that elevated depressive symptoms ($\chi^2 = 3.86, p<0.5$) before surgery were significantly predictive of 2-year cardiovascular mortality. Other significant contributions to 2-year mortality included: history of CHF ($\chi^2 = 4.94, p<.02$) and history of COPD ($\chi^2 = 5.19, p<.02$). The ability to predict the likelihood of postoperative depression in the cardiac surgery population has tremendous implications for health care consumers, providers and health care costs. Early identification and treatment of depression will not only positively impact the patient’s quality of life but potentially reduce mortality and the costs associated with readmission and long-term care.

Findings from many studies have revealed that depression is an independent risk factor for cardiac events after surgery. However, small sample sizes and short follow-up times and inadequate power to assess mortality have left investigators unable to assess mortality outcomes. Using the Center for Epidemiological Studies-Depression (CES-D) scale, Blumenthal et al. (2003) examined whether depression was associated with an increased risk of mortality after CABG surgery. Eight-hundred and seventeen patients were assessed before surgery, 6-months after surgery and within 12-year follow up. Patients with moderate to severe depression at baseline (adjusted hazard ratio [AHR] 2.4, 95% Confidence Interval [CI] 1.4-4.0; p=0.001) that persisted up to 6-months (AHR 2.2, 95% CI 1.2-4.2; p=0.15) had a risk of death more than two times higher (AHR 2.4, 95% CI 1.4-4.0; p=0.001) respectively than did non-depressed patients. Depression before surgery predicted increased risk of death after surgery. These findings reinforce the importance of preoperative assessment of patients at risk for clinical levels of postoperative depression. Early
identification can assist health care professionals in planning preventive counselling and supportive intervention in order to meet the needs of this patient population.

Understanding Social Support

The phenomenon of social support has been studied from various traditions and approaches. The seminal writings of sociologist, Durkheim (1897/1951) postulated that a stable social structure and widely held norms were protective and served to regulate behavioural outcomes (as cited in Cohen et al., 2000). Consistent with this thinking, his analysis of suicide rates indicated suicide was most prevalent among individuals who were not married and lacked ties with the community and parishes. A breakdown in social ties was thought to produce a loss of social resources and thus, a reduction in social constraints.

During the late 1960’s and early 1970’s, a rekindled interest in the relationship between social ties and psychological well-being emerged. Several studies revealed that those who participated in their community and larger society were in better mental health than their more isolated counterparts (Haynes et al., 1978; Haynes et al, 1980; Cohen & Wills, 1985). From an epidemiological perspective, Cassel (1976) examined if social-environmental factors could change human resistance to disease. After studying the social environments of individuals with chronic diseases (i.e. tuberculosis, schizophrenia and alcoholism), he concluded that changes in the social environment act as predisposing factors that may enhance the host’s susceptibility to disease. In essence, social support provided a protective factor that buffered or cushioned the individual from the physiological and psychological consequences of exposure to a stressful situation. Similarly, Cobb (1976) argued that individuals with strong social ties were protected from the potential pathogenic effects of stressful events. During major life transitions and crises, the perception of support
from others facilitated coping and adaptation. Cohen and Wills (1985) further suggested that whether or not one actually receives support is less important for health and adjustment than one’s beliefs about its availability.

*Defining Social Support*

Social support has been recognized in the broadest sense to encompass any process through which social relationships might promote health and well-being (Cohen et al., 2000; Langford et al., 1997; Thoits, 1986). Oermann (1991) defines social support as resources provided by others that can take the form of emotional support (provisions of confidant support, attachment); instrumental aid (provision of tangible support, material aid); information (provision of advice, guidance, appraisal and problem solving); and positive feedback as to one’s importance, capabilities or self worth (validation, integration and feedback). Most authors, according to Oermann, make a distinction between structural and functional social support. Structure refers to the existence and interconnectedness among social ties, including the spouse, relatives, neighbours, and friends with whom one maintains close contact. Functional status indicates the degree to which a spouse, friend, neighbour, and others provide emotional support, aid, information, affection and positive feedback.

Social support has been considered a meta-construct consisting of supportive behaviour, subjective appraisal of potential helping resources, and supportive resources (Hupcey, 1998; Vaux, 1988). There is a lack of agreement concerning the conceptualization and the measurement of social support. This has produced an impediment to the production of valid generalizations about the development and functioning of social support (Sandler & Barrera, 1984). Stewart (1993) argued that there is conceptual confusion and implicit assumptions regarding researchers’ perceptions of what actually constitutes social support.
As a multidimensional concept, careful re-consideration in defining and measuring social support is necessary in order to strive for conceptual clarity. For the purpose of further analysis, social support refers to ‘any process through which social relationships may promote health and well-being’ (Cohen et al., 2000).

The importance of social relationships in the trajectory of disease and the maintenance of health and well-being has drawn attention across a large number of behavioural science and health disciplines. Interventions designed to alter the social network and individual’s transactions within it have been successful in facilitating psychological adjustment, aiding in recovery from traumatic experiences, and even extending life for individuals with serious chronic disease (Cohen et al., 2000). A considerable body of literature suggests that social support, as a motivating factor, is connected to well-being and positive health outcomes (Cohen et al., 2000; Oermann, 1991;). Several authors have examined the link between social support, stress, coping, and the onset of illness (Hyman & Woog, 1982) in family (Meagher-Stewart & Hart, 2001) and individual coping (Dennis et al., 2002; Lawrence, 2002). To that end, social support has been identified as a mediating factor in individual, as well as family coping. The constellation of internal and external supports, as well as one’s beliefs about its availability, may facilitate successful transition through stressful life events such as having CABG surgery.

*The Stress-Buffering Model*

Authors have identified the conditions under which social support may influence health (Cohen & Wills, 1985; House, 1981). In particular, the stress-buffering effect model proposes that social support either protects individuals from potentially harmful influences of stressful events or determines individual responses to potentially stressful events. (Cohen et
al, 2000). This model is guided by Lazurus and Folkman’s (1984) work in which coping involves the changing of cognitive and behavioural efforts to manage specific external environmental and/or internal demands that are appraised as exceeding the resources of the individual (Figure 1). The coping process incorporates the dual goals of problem-resolution and emotion-regulation while employing affective, cognitive and behavioural response systems.

According to Cohen et al. (2000), peer relationships may influence the individual’s primary appraisal of a stressor not only through direct responses, such as the provision of information about the nature of the stressor and active effort to alleviate or diminish it, but also indirect responses involving social comparison. The peer interventions may provide credence to personal involvement and experiential knowledge, which facilitates a cathartic and empathetic dimension to the interventions (Stewart, 1990). Supportive actions (such as peer intervention) are thought to enhance coping performance while perceptions of available support lead to appraisal of threatening situations as less stressful. Founded on this mutual identification, shared experience and sense of belonging, this theoretical basis is suggestive of peer support positively affecting psychological and physical health outcomes (Cohen et al., 2000).
Figure 1 - The supportive actions approach predicts that perceived support enhances coping, which buffers the relation between stress and health outcomes.

Social support is considered a relatively accessible resource that presents a potentially cost-effective and ecologically valid approach to the promotion of recovery from illness (Gottlieb, 1991). Numerous investigators have focused on the influence of social support on recovery from chronic illnesses such as heart disease and stroke. Social support has been shown to exercise a strong buffering effect between the stressor effect of a myocardial infarction (MI) event and defined health outcomes such as higher perceived coping effectiveness, reduced anxiety and depression (Bennett, 1993; Medalie & Goldbourt, 1976; Thompson, 1989). For example, Berkman & Syme (1979) revealed in seminal work that after following a nine-year study of 6,928 Alameda county residents, greater social support was associated with lesser all-cause mortality and in particular, lower mortality from heart disease. The single most important indicator of whether an individual would be alive nine years later was the degree to which the person’s social network and contacts were developed.
The connection between social support and mortality was reinforced in a subsequent study in which social support was a powerful and consistent predictor of survival at 6 months following a MI, even when compared with other factors such as gender, age, co-morbidity, previous MI and presence of ventricular tachycardia (Berkman et al., 1992). The positive association between social support and quality of life for stroke survivors and their families is also well documented (Conn et al., 1991; Gottlieb et al., 2001; Grant et al., 2001; Mant et al., 2000). Availability of instrumental and emotional support, forms of social support, from family members may be a major factor in whether or not stroke patients with physical and/or cognitive deficits live at home rather than in an institution (Meagher-Stewart & Hart, 2001).

Approaches that address the physiological and psychosocial issues that patients and families may incur in the early recovery period must be developed during the turbulent times of healthcare reform. Strategies aimed at strengthening supportive relationships within and beyond their interpersonal networks may be a strategy that will facilitate individual recovery outcomes but also recognize that health care professionals alone are unable to comprehensively address evolving health care needs. In times of change, it is necessary that collaborative approaches to facilitate patient transition and recovery post-discharge be considered. A professionally guided peer support program may be one such approach.

Historically, nurses have been responsible for facilitating patients’ transition from hospital to home and providing discharge education. In fact, nursing follow-up has been widely demonstrated to enhance cardiac surgery recovery (Beckie, 1989; Gilliss et al., 1993; Johnson, 2000; Naylor & McCauley, 1999; Nicklin, 1986; Roebuck, 1999; Wu, 1995). Telephone follow up (by nurses) has been used in a variety of settings as a means of supporting patients post-discharge.
However, under restructuring and current fiscal constraint, nurses now have a narrower scope of time to provide education to patients and families and longer-term follow-up is often not possible. Alternative strategies need to be put forward. Peer support interventions that focus on post-discharge recovery from CABG surgery as well as promotion and maintenance of healthy behaviours have the potential to impact patient recovery and satisfaction, as well as lighten the financial burden on the health care system associated with readmissions to hospital, unnecessary Emergency room visits and physician follow up.

Peer support, a form of social support merits great potential in facilitating patient recovery (psychologically and physiologically) and rehabilitation post cardiac surgery. One-to-one peer support interventions have the potential to not only impact patient satisfaction but also assist in alleviating some of the financial constraints placed upon the health care system today.

*Peer Support Defined*

Peer support is a type of social support that incorporates information, appraisal (feedback) and emotional assistance; provided by individuals who possess experiential knowledge, shared previous experiences (i.e. CABG surgery) and similar characteristics (i.e. age, gender, location, cultural, socioeconomic status) (Ashbury et al, 1998; Bandura, 1986; Parent & Fortin, 2000). Peer support is a created source of support that extends beyond the individual’s natural or embedded social networks such as family, friends, church members, neighbours. According to Cohen et al. (2000), peer relationships may influence the individual’s primary appraisal of a stressor not only through direct responses, such as the provision of information about the nature of the stressor and active effort to alleviate or diminish it, but also indirect responses involving social comparison. The peer relationships
may provide credence to personal involvement and experiential knowledge, which facilitates a cathartic and empathetic dimension to the interventions (Stewart, 1990). Supportive actions (such as peer intervention) are thought to enhance coping performance while perceptions of available support lead to appraisal of threatening situations as less stressful. Founded on this mutual identification, shared experience and sense of belonging, there is evidence to suggest that peer support positively affects psychological and physical health outcomes (Cohen et al., 2000).

Peer support can be provided through multiples modes of interaction (individual one-to-one, self-help/support groups, on-line computer-mediated groups or within an educational milieu). Many intervention studies focus on support within both dyadic and group settings, however few focus on one-to-one peer support within the post-cardiac surgery population. Unfortunately, peer support, within the umbrella of social support, is also a complex phenomenon whose application is vague and highly variable, although its benefits continue to be sought after as a means for improving health outcomes (Dennis et al., 2002; Stewart, 1993). The attributes (information, appraisal and emotional assistance) are the supportive functions of peer relationships and may be differentially useful for various stressors and health outcomes. For example, peer interventions with a health promotion focus typically have a stronger informational component originally and later integrate appraisal and emotional support for reinforcement (Dennis et al., 2003a).

There are important distinctions between support provided by professionals and that from lay helpers (Gottlieb, 1983). Lay support tends to involve practical help, reciprocity, friendship-based relationships, altruism, experiential knowledge, solicited and unsolicited advice, self-disclosure, reassurance, alternative interpretations, minimization of the
importance of problems and consensual validation (Ayers, 1989). Peer support incorporates the components of the lay helper’s experience in combination with preparatory training for the role, while maintaining the ‘peer’ versus paraprofessional or professional level of instruction.

The use of peer supporters as lay educators can be a credible source of information and serve as role models for health-enhancing behaviours (Cohen et al., 2000). The strength of using the peer lies in their ability to identify with the people whom they are helping. This may include shared life experiences or similar ethnic, social, cultural and socio-economic backgrounds. Peer volunteers can often overcome the barriers that many professionals may encounter in working with specialized groups (Brunier et al., 2002; Glanz et al., 1986). Lay assistance from individuals (volunteers) who possess experiential knowledge and similar characteristics is expected to lead to validation, normalization of the experience, a reduction in social and emotional isolation and a sense of belonging (Cohen et al., 2000). Therefore, the peer support movement specifically incorporates peer individuals with experiential knowledge and training (Dennis, 2003a), who extend beyond the natural social networks, which in turn, complement the delivery of professional health services.

Peer support merits great potential for success but it is clear that simply the sharing of an experience, for example, breast cancer or heart disease, does not qualify one individual to help another. The ability to empathize or set one’s experience aside enough in order to enter the world of another seems to be one fundamental aspect of good helping (Pistrang et al., 1999). Support systems, whatever else they provide in a time of crisis and need, impart to people a general and abiding sense of security and well being however, one must take precautions in designing social support interventions appropriately. Adequate training and
reinforcement are required to develop the volunteer’s sense of competency and to foster their feelings of value. An integral part of preparing a peer volunteer for their support role needs to consist of instruction in communication, particularly active listening skills and problem solving techniques. The importance of preparation and appropriate timing regarding peer support interventions is critical. Ineffective, inadequate or poorly timed lay support may indeed create added stress on behalf of both the peer and advisee (Ayers, 1989; Jacobson, 1986).

Cohen et al. (2000) identified that peer support interventions must be well planned and integrate a formal educational component for peer volunteers in order to enhance the success of the program. Since the need for social support may change over time and with varied life circumstances, the timing and preparation of the peer/intervention is key. The ability to match peers with individuals who may have experienced a similar life event or transition will greatly increase the likelihood of successful outcomes (Whittemore et al., 2000).

Patient-to-patient programs promote recovery and rehabilitation by facilitating interactions between individuals who have essentially completed their rehabilitation and those who are anticipating a similar course of treatment (Cutrona, 1990). The therapeutic effect of social support may be a combination of emotional and material aid or it may modify the individual’s stress response by altering the individual’s perception of the stressor and therefore, affect health outcomes. The ultimate goal is to assist individuals to attain their optimal level of health and to develop and maintain health-promoting behaviours.

Schwartz and Sendor (1999) identified that there is a small but growing research base which suggests that helping other people may be beneficial to the helper. In a secondary
analysis of their data, the impact of being a peer supporter on the actual peer supporters themselves was examined. Peer telephone supporters reported pronounced improvement in confidence, self-awareness, self-esteem, depression and role functioning through their involvement and contact with physically ill patients (multiple sclerosis). The concept of reciprocity as a dimension of social support has been considered the simultaneous return of social support and exchange of resources between the peer and advisee (Whittemore et al., 2000). The principle of providing support may be as important as receiving it and this aspect of supportive relationships requires further investigation.

While the benefits of social support are widely acknowledged throughout the literature, it is also necessary to consider the potential adverse effects that may occur in a supportive relationship. Henderson (1995) examined data from two phenomenological studies on peer-provided support for abused women in transition housing. The more experienced women in transition housing often had a need to give support to newer women to show evidence of their own recovery. However if this support was rejected, Henderson believed the results could be devastating for the support provider. Savishinsky (1992) observed that the experience of being a support provider could be emotionally demanding for the volunteers when they had to deal with deterioration of health. Peer volunteer attrition rates in various studies may be attributed to negative experience or disengagement as a result.

Indeed, living with heart disease and the life changes associated with cardiac surgery can be regarded as stressful. The direct effect of peer support is thought to enhance health and well-being, as well as moderate negative emotional responses to a stressful event (Cohen & Syme, 1985; Gottlieb, 1981). The availability of an individual or 'similar other' (someone who has been through the experience) is a strong resource to counteract the negative effect of
threats to self-esteem. Peer support can provide such exchanges that can foster self-esteem, self-efficacy and self-appraisal in the setting of stressful life events (Cohen et al., 2000).

Peer Support and Recovery from CABG Surgery

Meagher et al.,'s (1987) conceptualization and description of a dyadic social support program for cardiac surgery patients provided a unique Canadian perspective on the success of the Open Heart Patient Support Program in Halifax, Nova Scotia. Crude measurements (various sources of evaluative data, namely visiting statistics, number of visits, volunteer report analysis and physician comments) of the effectiveness of this particular social support intervention were examined. Peer-patient visitation occurred in hospital prior to, during (with family) and after the surgical procedure with 75% of 650 (approximately 40 patients per month) patients undergoing surgery per year being seen by a peer group volunteer. Emotional support was identified as the most important type of support. This study revealed that the support received from 'peers' appeared to have a significant buffering effect through increasing the cardiac surgery patients' readiness for cardiac surgery and motivation for cardiac rehabilitation (Meagher et al., 1987). The lack of reliable and valid data measurements posed significant problems with study design and outcomes. The need for rigorous empirical studies to determine the impact of dyadic or peer support interventions on stress and health outcomes is essential.

Halfmann (2000) investigated the effect of peer support had on cardiac patients' compliance to medical regimen. The subjects were randomly assigned to receive peer support (n=43) in the form of once monthly telephone calls over six months from a cardiac peer who was enrolled in Phase III of cardiac rehabilitation, or be in the control group (n=45). Compliance was measured on the five subscales of the Health Behaviour Scale (HBS), which
included: diet, exercise, medications, stress modification and smoking reduction/cessation. The experimental group had a significantly greater increase in compliance to stress modification (p=0.018) than did the control group. In addition, the control group demonstrated a significant decrease in compliance to diet (p=0.035), exercise (p=0.023) and smoking reduction (p=0.023) over the follow-up period. The author undertook some gender-based analyses, but found no differences; likely due to small sample size. Peer support played an essential role in patients' longer-term compliance to medical regimens. These findings further reinforce that psychosocial support can improve regimen compliance and potentially accelerate recovery.

In a randomized controlled trial, Parent and Fortin (2000) attempted to determine whether vicarious experience (former patient visit to patient undergoing cardiac surgery) reduced anxiety and increased self-efficacy expectation as well as self-reported activity in male patients (n = 56) after surgery. Anxiety was measured using the State-Trait Anxiety Inventory (STAI) (Spielberger, 1976) at 48 hours and 24 hours prior to surgery, and again at 5 days and 4 weeks post-procedure. The Jenkins Self-Efficacy Expectation Scales (1989) were used to rate self-efficacy expectation. The experimental group reported significantly higher levels of self-efficacy expectation (p<0.01) and self-reported activities thus implying that dyadic support is a valuable tool for recovery from cardiac surgery. Despite the limitation imposed by a small sample size, these findings provide further support for positive health outcomes associated with peer support interventions.

Whittemore et al. (2000) expanded examination of the social support relationship in an attempt to understand the experience of the cardiac peer advisor. Qualitative analysis revealed that helping, mutual sharing, committing and benefiting were characteristics of peer
experiences. The approach wherein one may capitalize on the peer advisors' potentially influential relationships and their ability to relate to the needs and concerns of a targeted group is key. The ability to provide support to others was evidence of their own recovery. Brunier et al.'s (2002) exploratory, longitudinal study further reinforced that peer support counseling is a two-way affair. Renal peer support volunteers identified that they maintained, and possibly improved their own well-being by helping others with chronic renal failure.

Although peer support within a group modality has been suggested as useful in enhancing coping skills for both individuals and family members, research regarding the usefulness of individualized peer support is lacking. Few research studies have focused on the concept of individualized telephone peer support versus nurse-initiated support, in the post cardiac surgery patient population (Halfmann, 2000; Meagher et al., 1987; Parent & Fortin, 2000). As determined from the literature, this patient population undergoes numerous changes both physiologically and psychologically after surgery. The risk of maladaptive transition, coupled with the added stress of unanswered questions may predispose this vulnerable population to further demise.

Summary

Despite the large number and varied demographics of individuals recovering from CABG surgery, few studies have examined factors related to one-to-one peer support and health outcomes in this population. Numerous investigators have highlighted the needs of post-bypass patients upon discharge from hospital (Artinian, 1993; Beggs et al., 1998; Goodman, 1997). However, issues such as, 1) the numerous post-discharge psychological and information needs of patients and their families, 2) the timing, intensity, and delivery of follow-up, as well as, 3) family members need to be included in any intervention are in need
of continued investigation (Hartford & Wong, 2001). In light of the cutbacks related to health care reform that have resulted in decreased lengths of stay, peer support interventions specifically designed to alter the social environment and the individual's interactions with it, are an important alternative to consider in the new healthcare milieu.

Social support has been strongly linked to positive health outcomes. Peer support, a form of social support has the potential to provide individuals with additional resources once discharged from hospital. A study that investigates the effect of peer support on both the patient as well as the peer supporter, will offer additional insights into this phenomenon and how health care professionals can plan interventions to better respond to the special needs of this population.

While some authors (Halfmann, 2000; Meagher et al., 1987; Parent & Fortin, 2000; Thoits et al., 2000) have contended that one-to-one peer support interventions enhance health outcomes, it is necessary to investigate this intervention using appropriately designed and powered studies. Peer support interventions have the potential to not only impact patient satisfaction but also lighten the financial burden on the health care system associated with readmission to hospital and unnecessary Emergency room visits. A one-to-one (telephone) peer support program could improve accessibility to knowledge and resources for those who live outside of major centres. This type of support intervention has the potential to impact patient transition and recovery in ways that may include: an increase in patient’s self-esteem (decrease in stress and depression) through peer modeling effects; improvement in compliance to recovery regimen (including cardiac pre- and rehabilitation attendance and follow through); risk factor modification and compliance (secondary prevention); a positive influence on time to role resumption; earlier referral for follow up (to the nurse practitioner)
in the case of postoperative complications which in turn, will impact postoperative mortality
and morbidity rates. It is essential that further study regarding the relationship of peer support
intervention, health outcomes, and discharge transition in the post-CABG surgery patient
population be undertaken.
CHAPTER THREE
DESIGN & METHODOLOGY

Research Design

A randomized controlled trial (RCT) design was used to examine the effectiveness of a professionally-guided telephone peer support program (over 6-weeks from time of operation) on the early recovery outcomes (over 12-weeks from time of operation) in Ontario men recovering from CABG surgery. The effectiveness of a post-discharge professionally-guided telephone peer support intervention on patients’ depression, perceptions of recovery (i.e., return to activity, return to social roles, biophysical progression), social support and use of health care resources was examined. Ancillary narratives of the participants were also collected and descriptively examined to support the quantitative data.

Setting and Protection of Human Rights

The appropriate medical and nursing administrators and stakeholders at each hospital were contacted to seek their support of this study. The protocol for this study underwent ethics review by the Conjoint Health Research Ethics Board, University of Calgary, Alberta; Sudbury Regional Hospitals, Sudbury, Ontario, Sunnybrook and Women’s Health Sciences Centre, Toronto, Ontario, and Southlake Regional Health Centre, Newmarket, Ontario.

After receiving approval from the respective Institutional Ethics Review Boards (see Appendix A for letters of ethics approval), the study was conducted at three cardiac centers in Ontario. Three sites were chosen because of geographical location, number of cardiac surgical cases per year, similar patient demographics, surgical procedures and process of postoperative care. The Sudbury Regional Hospital, Memorial site (n = 39/185; 21%), a tertiary care center in Northeastern Ontario was the initial site in which participants were
enrolled in the study. The Cardiac Surgery program completes approximately 800 surgical cases per year (CABG and valve surgery) and provides cardiac services to the catchment area from Parry Sound to Thunder Bay, Ontario. Due to lower than expected enrolment of eligible participants at the Sudbury site, the decision to enroll two other study sites was made.

The Schulich Heart Program at Sunnybrook and Women’s Health Sciences Centre (n = 127/185; 69%), a major tertiary care centre located in Toronto was the second site to enroll participants. This Cardiac Surgery program completes approximately 900 cases per year (CABG and valve surgery) and provides cardiac services to the greater Toronto area and surrounding regions.

The third site was Southlake Regional Health Centre (n = 19/185; 10%), a community-based hospital located north of Toronto, which serves a catchment area of approximately 200,000 people (in northern York Region, south Simcoe County and northwest Durham Region). The Cardiac Surgery program completes over 800 surgical cases per year (including CABG & valve).

The standard surgical bypass procedures (surgery technique, time to extubation, intensive care unit (ICU) stay, transfer to patient care unit) and processes of care as well as typical length of hospital stay were consistent across all three sites (note inclusion criteria of less than eight days in-hospital stay).

Sample

CABG Surgery Patients

Initially, we anticipated recruiting both men and women into the study. However, after enrolling 52 men and only 2 women, as well as experiencing greater difficulty recruiting female peer volunteers, the decision was made to proceed by focusing only on
male CABG surgery patients. The reason for exclusion was based on the inability to truly reflect the gender differences (depression and recovery processes) based on so few female participants. The inclusion of such data may have potentially led to a confounding effect of study results. Additionally, women (both study participants and peer volunteers) were extremely difficult to recruit and maintain in the study. The 2 women’s data sets were not presented (removed from database) and all annual/final reports to the ethics review committees reflected the solely male sample composition.

Men\(^1\) in this study were selected from the patients undergoing elective traditional coronary artery bypass graft (CABG) surgery at the Sudbury Regional Hospital, Memorial site, Sunnybrook and Women’s Health Sciences Centre and Southlake Regional Health Centre. The inclusion criteria for the sample were as follows: (1) English speaking, (2) \(\geq 35\) years of age), (3) undergoing first-time traditional (sternotomy approach) CABG surgery, (4) an uncomplicated postoperative course, (5) standard length of hospital stay (four to eight days), (6) had a telephone in the home, and (7) able to hear telephone conversation. The exclusion criteria included persons who: (1) had cardiac surgery procedures other than CABG surgery, (2) resided in a nursing home or long term care facility, (3) had any neurological or psychiatric disorder that may have impeded ability to self reflect or communicate, (4) had emergent cardiac surgery, and (5) had sustained in-hospital post surgical complications of major significance (i.e., stroke, GI bleed, cardiac tamponade, renal

\(^1\) It was unlikely that we would be able to find a peer support volunteer who would be \(\leq 40\) years of age. Thus, to meet the goal of attempting to match the peer supporter and patient in approximate age, we needed to limit the age of the sample of patients.
failure, cardiac arrest, major sepsis of any origin, deep sternal wound infection, myocardial
infarction with significant hemodynamic compromise).

Peer Volunteers

Peer volunteers consisted of men who had undergone successful CABG surgery and were post-recovery at least 6 months to one year. The recruitment of peer volunteers was facilitated through the use of the in-hospital peer support program ‘Mended Hearts’ and the community-based rehabilitation program at the Toronto Cardiac Rehabilitation Institute (TRI) (see Appendix B for letters of support). The investigator obtained written permission from the Vice President of the ‘Mended Hearts’ Association and the Medical Director of TRI in order to use the peer volunteers from these programs in this study. The investigator presented the potential peer volunteers with an overview of the study, necessary time commitment and ethical considerations.

Professional Guidance - Nurse Practitioner

A cardiovascular acute care nurse practitioner (ACNP)(the investigator) acted as a resource and provided necessary guidance to the peer supporters throughout the 5-week peer support intervention (total 6 weeks post discharge). The role of the ACNP (investigator) was to:

1) train peer volunteers

2) act as a resource (the ACNP – investigator was available 24 hours a day by pager for peer volunteer consultation) in the case where the peer volunteer identified a situation beyond their scope (i.e. red flags or emergent issues that required professional consultation/medical care),
3) oversee peer volunteers and assist in problem identification and solving, decision making, as well as referral, if necessary, and
4) assure follow through in the case that a patient had been referred to their physician for follow up (i.e., the ACNP (investigator) would call the patient and/or physician and confirm that the patient had sought care with a health care professional). The ACNP (investigator) contacted the peer volunteers during the initial peer support intervention (week 2 or 3) in order to answer any questions and ensure consistency in adherence to study protocol (number of calls, frequency, etc).

Instruments

The measures for this study (see Appendix C for instruments) included the Expectations Inventory Questionnaire (EIQ) (Rankin, 1989; King, 2000), Beck Depression Inventory II (BDI-II) (Beck, Steer & Brown, 1996), Shortened Social Support Scale (Funch et al., 1986), Postoperative Self Report of Recovery (PSRRQ), Gortner et al., 1988; King & Gortner, 1996; King, 2000), and Peer Support Evaluation Inventory (PSEI) (Dennis, 2003). A health record audit (HRA) was used to collect demographic and relevant health information. The following illustration (Figure 2) provides an overview of study timelines, data collection protocols, and follow-up for the duration of the study.
1st time CABG Surgery Patients Identified by Team leader

Team leader sought permission from potential participant to be approached by investigator

Team leader provided potential participant name to investigator once permission obtained

Potential participant screened postoperative day 3/4
Met with participant to determine interest in study

Yes
Consent/Randomized
No
Did not participate in

INTERVENTION

Day Before Discharge from Hospital
• Pre-intervention questionnaires (SSSS, BDI-II, EIQ)
• Informed of assignment (intervention/control)
• Provide instruction regarding expectation to receive

Participants discharged home
Health Record Audit (HRA) completed by investigator/assistant before discharge home from hospital

Post Discharge Day # 3 or 4
• Intervention occurs
• Peer volunteer calls participant
• First call 3 days after discharge, then weekly for 5 weeks total (6 weeks post discharge)
• Use of call template

6 and 12-Week Follow up
End of Study
• Complete post-intervention follow up questionnaires
-SSSS, PSRRQ, PSEI, BDI-II

CONTROL

Day Before Discharge from Hospital
• Pre-intervention questionnaires (SSSS, BDI-II, EIQ)
• Informed of group assignment (intervention/control)
• Provide instruction: no peer support call will occur

Participants discharged home
Health Record Audit (HRA) completed by investigator/assistant before discharge home from hospital

6 and 12-Week Follow up
End of Study
• Complete follow up questionnaires
-SSSS, PSRRQ, BDI-II

Instruments: SSSS (Shortened social support scale, Funch et al., 1986); BDI-II (Beck Depression Inventory II, Beck, Steer & Brown, 1996); PSRRQ (Post operative self report of recovery questionnaire, King & Gortner, 1996); EIQ (Expectations Inventory Questionnaire, Rankin, 1989; King & Gortner, 1996); PSEI (Peer support evaluation inventory, Dennis, 2003b).

Figure 2 - Overview of study map
Questionnaires Completed by Participants

*Expectations Inventory Questionnaire (EIQ)*

The EIQ was originally named the pre-operative interview questionnaire (Rankin, 1989, 1990) and was developed at the Cardiac Recovery Laboratory, University of California. This questionnaire has been previously used successfully in a variety of patient populations (Gilliss et al., 1993; Gortner et al., 1994; King & Gortner, 1996; Rankin, 1989, 1990; King 2000). It was used in this study for the same reasons it had been used previously; to establish individual patient baseline characteristics. This questionnaire was amended somewhat (particularly related to tense of questions), because the subjects were interviewed following their surgery as opposed to before their surgery. Data were collected on the following components: current living arrangements, post-discharge plans, caregiver support, work history, lifestyle activities and education. Pertinent components of the Postoperative Self Report of Recovery were adapted and included in the EIQ in order to facilitate the timely collection of data (i.e. discomforts & symptoms). Components that were not considered applicable to the early postoperative (in-hospital period) were omitted (i.e. “have you returned to your normal activity” and “have you participated in a formal cardiac rehabilitation program?”). The purpose of collecting these data was to provide the investigator with a baseline before initiating the intervention. This also provided demographic data and comparative data for descriptive indicators of the sample.

*Health Record Audit (HRA)*

The Health record audit (HRA) was completed when the participant was discharged from hospital to obtain specific data concerning individual health history (co-morbid conditions), surgical intervention, extent of disease, length of stay in hospital and significant
in-hospital events. This health record audit has been successfully used in various forms in a series of studies (Gortner et al., 1994; King & Gortner, 1996, King, 2000).

Postoperative Self-Report of Recovery Questionnaire (PSRRQ)

The established Postoperative Self-Report of Recovery Questionnaire (PSRRQ) was developed at the Cardiac Recovery Laboratory, University of California, San Francisco. The PSRRQ has been used extensively in the cardiac surgery population (Gortner et al., 1988, 1989, 1994; Rankin, 1989, 1990; King & Gortner, 1996; King 2000). This self-report instrument consists of questions regarding return to activity, cardiac rehabilitation attendance, experience of common cardiac and postoperative symptoms, use of medical and nursing services, as well as self-reports of New York Heart Association (NYHA) classification, life quality, life satisfaction and perceived recovery. It also includes single item questions requiring subjects to rate their expectations and perceptions of recovery. Participants responded to items according to a 0 to 10-point Likert scale (0 = lowest possible rating; 10 = the highest possible rating). It took approximately 20 minutes to complete this questionnaire. One revision that was made in order to reflect Canadian Angina Guidelines was the exclusion of the NYHA heart failure classification. The Canadian Cardiovascular Society (CCS) Guidelines for angina classification (Campeau, 1976) were included. Content validity has been established for the EIQ, the HRA and the PSRRQ as these instruments have been used previously in the cardiac population and elicit data necessary to measure recovery from cardiac surgery. Furthermore, items on these instruments could concurrently validate areas measured by other instruments in this study.
Shortened Social Support Scale (SSSS)

The Shortened Social Support Scale (SSSS-PI) was developed by Funch et al. (1986) and provides a general measure of sources of social support as well as the perception of such support. Respondents were asked to rate the amount of support received from each of several sources with respect to a specific situation. Scoring for the SSSS-PI was based on the mean perceived support score from all the sources indicated as available.

The scoring techniques vary according to the conceptualization of social support in the particular study. The three scoring techniques presented by Funch et al. (1986) included: 1) an estimate of the variety of sources available in the support network which provides information regarding the size of the support network (this involves dichotomizing all responses as applicable or not applicable and summing across the categories); 2) an estimate of mean support from all the perceived sources indicated as available (mean score); and 3) an estimate of all non available sources of support (scored as 'one' and overall mean is computed). The second scoring method was especially relevant in this study since the focus was on perceived sources of support.

Funch et al. (1986) indicated that internal consistency for the SSSS-P1 favourably ranged from 0.61 to 0.84. Validity assessments, both criterion and construct validation techniques have been supportive of the usefulness of the SSSS-P1. The SSSS-P1 has predicted psychological status in a number of patient populations. Indeed this scale is used infrequently and has not been revised in the last 10 years, however, it was chosen because it is provides information on support by source. This allowed for the analysis of the relations of support to health-related outcomes for each source based on consideration of a specific situation. It was flexible, compact and easy to administer. The scale has been used previously
by Rankin (1989, 1990), King & Gortner (1996) and King (2000) when studying patient recovery from cardiac surgery. Social support was explored in conjunction with the Postoperative Self Report of Recovery Questionnaire.

**Beck Depression Inventory (BDI-II)**

The new edition of the BDI–II (Beck et al., 1996) builds upon its predecessor (the Beck Depression Inventory) and consists of 21 items that assess the intensity of depression in clinical and normal patients. Each item is a list of four statements arranged in increasing severity about a particular symptom of depression. Items on the new scale replace items that dealt with symptoms of weight loss, changes in body image, and somatic preoccupation. Another item on the BDI that tapped work difficulty was revised to examine loss of energy. Also, sleep loss and appetite loss items were revised to assess both increases and decreases in sleep and appetite. These new items bring the BDI–II in alignment with the depression criteria of the Diagnostic and Statistical Manual of Mental Health Disorders - Fourth Edition (DSM–IV). Current DSM–IV guidelines require assessing depression symptoms over the preceding two weeks. The time frame for the response set in the new edition was changed from one week to two to comply with DSM-IV guidelines. The BDI-II has been an effective as a measure of the severity of depression in outpatients and short-term inpatients. The BDI-II was scored by summing the highest ratings for each of the 21 symptoms. Each symptom is rated on a 4-point scale ranging from 0 to 3, and total scores can range from 0 to 63. According to Beck et al. (1996), BDI-II total scores may range from: 0 to 13, representing “minimal” depression; 14 to 19, representing “mild”; 20 to 28, “moderate” and; 29-63, “severe” depression. The inventory takes five minutes to complete and has proven clinical sensitivity. After testing original and new items on a large clinical sample (N = 500), test
developers compared item-option characteristic curves. The new editions showed improved clinical sensitivity, with the reliability of the BDI-II (Coefficient Alpha = 0.92) higher than the BDI (Coefficient Alpha = 0.86). Beck et al. (1996) reported convergent and discriminant validities as the BDI-II was more positively correlated with the revised Hamilton Psychiatric Rating Scale for Depression (Riskind, Beck, Brown & Steer, 1987; r = 0.71) than with the revised Hamilton Rating Scale for Anxiety (Riskind et al., 1987, r = 0.47). One week test-retest reliability has also been reported as high (r = 0.93, p<0.001) in psychiatric outpatients before their first and second cognitive therapy sessions.

Peer Support Evaluation Inventory (PSEI)

The Peer Support Evaluation Inventory (PSEI) was developed by Dennis (2003b) and has been used previously in women’s health population to elicit responses regarding participants’ perceptions of the peer support experience. Participants responded to single item statements using a 5-point Likert scale (1 strongly agree; 2, disagree; 3 unsure; 4 agree; 5 strongly agree). Examples of statements on the inventory include: “My peer listened to me talking about my feelings or concerns”, “I depended on my peer”, and “My peer seemed anxious when talking to me”.

This relatively new, self-report instrument has four subscales, all of which evaluate different aspects of the support received (supportive interactions, relationship qualities, perceived benefits, and satisfaction with the support received). Cronbach’s alpha coefficients for the subscales were identified as follows: supportive functions = 0.95; relationship qualities = 0.96; perceived benefits = 0.92; and satisfaction = 0.96. Based on Dennis’ extensive postdoctoral work, content validity has been reported by 1 Canadian and 2 American social support experts. For this research, the PSEI was modified slightly to reflect
the context specific to the cardiac population (i.e. a statement on the inventory such as, "I have something in common with other mothers" would be modified to "I have something in common with other cardiac surgery patients").

Study Reliability and Validity

Reliability refers to the consistency with which an instrument measures the study attribute of interest (Polit & Hungler, 1999). A reliable measure is one that maximizes the likelihood of a true score while minimizing the variation or risk of error in measurement.

Inter-rater reliability is of immediate concern if two or more observers are involved in the measurement process (Burns & Grove, 2001). Follow-up data collection phone calls (6 and 12 weeks) were made from a central site in order to enhance blinding and reduce bias. The investigator and assistants conducted regular inter-rater reliability checks (by comparing consistency of documentation and accuracy of response coding among individuals collecting measurement data). The comparisons rendered consistent documentation and accuracy of response coding between research assistants thereby indicating satisfactory reliability (>92%). This was done in order to ensure reliability between the individuals using the measures, interview guides and audit forms.

The RCT has become the gold standard for evaluating the effectiveness of treatment interventions (Devereaux et al., 2001; Kiene, 1996; Lauer & Topol, 2003; Montori et al., 2002; Rabeneck et al., 1992; Richardson, 2000; Solomon & McLeod, 1998). Study validity refers to a measure of truth or accuracy of a claim (Burns & Grove, 2001). Bias in the design of trial methodology can affect the validity of study results and therefore, the fundamental underpinning was to assess and isolate potential sources at the onset. The following
discussion identifies potential bias that the investigator considered and strategies used to minimize such threats to validity.

**Randomization**

Random assignment is the equiprobable and independent assignment of treatments to individuals (Fogg & Gross, 2000). These treatments usually consist of one or more intervention conditions and a control condition. Randomization is a term used to describe the process in experimental studies wherein participants are randomly assigned to either treatment or control groups. Randomization of the sample tends to produce groups comparable with respect to known and unknown factors that may influence outcomes (Friedman et al., 1998).

Essentially, the goal of randomly assigning individuals to intervention and control groups is to create equivalent groups where bias in treatment assignment and prognostic factors can be reduced or eliminated. Therefore, the control over individual assignment is removed from the investigator and left to random chance allocation. Although randomization does not guarantee complete objectivity in a trial, it reduces some sources of bias that can affect the validity of study results. Therefore, the allocation scheme must be combined with other design strategies in an effort to reduce overall bias.

Random assignment ensures that if there are any systematic or unmeasured differences within the sample, the differences will be randomly distributed among interventions (Witte, 1993; Wolff, 2000). However, random assignment does not guarantee that sample groups will be balanced or equivalent with respect to all prognostic factors. In particular, with small sample sizes it is possible to have unequal assignment but a well-structured allocation scheme can minimize this possibility.
Although there were several different methods of allocation schemes that could have been used, the one of choice for this study was the use of consecutively numbered, sealed, opaque envelopes containing a computer-generated number. The individual assigned to conduct this procedure was not involved in the recruitment process. Considering the moderate sample size, this approach was feasible in order to avoid imbalance in the differences among participants assigned to each group. Unequal assignment can lead to an inability to detect true differences between the two groups and may lead to some loss of credibility for the trial (Friedman et al., 1998; Mitchell & Jolley, 1992; Piantadosi, 1997). A rigid approach to random allocation and treatment assignment was essential to ensure study effect and credibility.

Randomization was achieved using a computer-generated random sequence of numbers ranging from 1 to 209. (A 2.5:1 control group to intervention randomization ratio was used). Numbers 70 to 209 were allocated to the control arm and numbers 1 to 69 were allocated to the intervention arm of the study. The randomly generated computer numbers were sealed in identical, opaque envelopes, which contained the trial identification and sequential numbering on the front of each envelope. The randomization list and envelopes were kept in a locked location away from the unit where participants were assessed for study eligibility. In order to maintain list privacy, treatment allocation was revealed only after receiving confirmation that the participant met eligibility criteria and had consented to the trial. The investigator or designate provided the recruit with the next sequential envelope and upon opening the envelope, participants were notified of their assignment to either the control or intervention arm of the study. Subsequently, when an intervention participant was identified, the investigator/designate referred to an available list of peer volunteers (with an
attempt to match on age) and was responsible for notifying the volunteer of the participant contact information.

**Blinding**

The principle of blinding refers to the intentional blinding or masking of the participant and/or the investigator to the identity of the assigned intervention. Several variations of blinding exist which are reported as single-, double-, and triple-blinded trials. The purpose of blinding is to exclude non-specific factors which may produce a desirable outcome but which are not due directly to the active intervention (Fogg & Gross, 2000; Richardson, 2000). In order to minimize bias and maintain the internal validity of the RCT, efforts to blind intervention assignment is key (Friedman et al., 1998). Unfortunately, it was impossible to blind the participants in this study to the psychosocial intervention. A placebo control group was not practical. Patients discharged from hospital were randomized into either the control or intervention group with the intervention group receiving the professionally-guided peer support. Participants and investigators were aware of the patients' assignment to either the control or intervention group. The single-blind approach involved blinding the follow up data collectors and assessors to participant allocation. Compared to an un-blinded approach, single-blinding offered less variability in sources of bias. For example, when clinicians or data collectors are unblinded, they may inadvertently influence a participant's compliance or willingness to continue in the study as well as affect patient reporting of symptoms (Devereaux et al., 2001). Therefore, the single-blind approach was used to the extent possible in this study. The investigator contacted the designated individual (unit manager or charge nurse) who informed the investigator of potential participants who agreed to be approached for recruitment (patients to be discharged). Participants were then
approached by the investigator (or designate) on the patient care unit, the day before discharge. When collecting data in follow-up (calls were made from a central site), every participant was coded according to their enrolment number and initials.

*The Intervention*

*Conceptual Basis of the Intervention*

Central to the internal validity of any RCT is a clear definition of the experimental stimulus hypothesized to cause change (Weinberger et al., 2001). The ‘intervention’ or ‘maneuver’ is defined as the treatment that the study group receives in a clinical trial or study (Kestle, 1999). Although much is written about the design, implementation and evaluation of trials, there is little guidance for designing psychosocial interventions in clinical trials.

Defining an intervention in effectiveness research involves the description of who is doing what and when in a manner that can be implemented uniformly and measured accurately. Psychosocial interventions present staffing arrangements and protocols that can be difficult to define and measure precisely (Wolff, 2000), thereby challenging the investigator to truly isolate the cause and effect relationship. The structure of a psychosocial intervention may be referred to as possessing a ‘soft’ or less controlled boundary which is much more difficult to structure. The intervention occurs within the larger social setting and each is directly or indirectly influenced by the other; the environment is permeable (Wolff, 2000). In contrast, a ‘hard’ boundary trial setting is structured, controlled and unaffected by outside forces.

A social support intervention is based on the premise of mutual disclosure, aid and a sense of belonging that comes from mutual identification (Cohen et al., 1995).
This type of support capitalizes on similarity among participants’ stressful experiences, which in turn fosters the process of mutual aid. In this study, CABG surgery patients who were randomized to the treatment arm of the study were linked to peer volunteers who had successfully recovered from this surgery. The intervention in this clinical trial was peer support, a form of social support. This type of intervention would also be categorized as a patient-centered intervention (PCI), which refers to interventions that address: a) salient characteristics of patients’ experiences and, b) interventions responsive to patients’ goals or preferences (Lauver et al., 2002). Based upon their experiential learning, peer volunteers (an individual who has successfully recovered from cardiac surgery; at least 6 months post-recovery) would provide telephone support to patients who were currently recovering from CABG surgery. The peer volunteer established initial telephone contact (see Appendix D for call template guide) with the subject three to four days after hospital discharge and weekly thereafter for the following 5 weeks post discharge (6 weeks post discharge). The support that the peer volunteer provided may have encompassed the following:

a) Informational (i.e. the provision of knowledge relative to problem solving; information regarding recovery norms, normalizing of physiological and psychosocial symptoms, in the form of factual input, relevant resources, advice, suggestions and feedback);

b) Appraisal (i.e. affirmational support involving the communication of information that is pertinent to self-evaluation; the appropriateness of emotions, cognitions, and behaviours (House, 1981); encouragement to persist in problem resolution, reassurance that efforts will result in positive outcomes relative to physiological and psychosocial outcomes);
c) Emotional (i.e. esteem-enhancing support that provides the individual with emotional support to counteract the doubts about their own ability; the provision of information and support regarding the emotional changes, transitions that may occur during recovery; such interactions include reassurance, encouragement, listening and reflection).

During this intervention, peer volunteers used resource information provided in the peer volunteer manual (see Appendix D for peer volunteer manual overview) to guide decision-making and problem solving. Any issues deemed beyond the scope of the peer volunteer were referred to the ACNP (investigator). The ACNP (investigator) ensured telephone communication and follow up with the subject.

Gross et al. (1993) offered four sources of information for developing psychosocial interventions that are based on strong theoretical and empirical foundation. The components of their strategy design included: 1) an explicit theory for the intervention, 2) a critical review of supporting descriptive data, and 3) evaluation of possible intervention strategies. Multiple sources of information are needed in order to develop interventions that address the complex health care problems facing patient populations today. One-to-one peer support within this context was anticipated to facilitate recovery outcomes and reduce health services utilization. Numerous investigators have focused on the review and evaluation of social support interventions in varied populations (Dennis et al., 2002; Dennis et al., 2003b; Goodman & Pynoos, 1990; Goodwin, 2001; Gottlieb et al., 2001; Greenwood et al., 1996) therefore, external validity for social support interventions has been well established in the literature.
Some authors argue the need for an alternative approach in assessing the effectiveness of socially grounded interventions (Gross & Fogg, 2001; Wolff, 2000) while others seek ways to strengthen the RCT design in effectiveness research (Kestle, 1999; Ward et al., 2003). According to Sidani et al. (2003), randomized clinical trials fail to account for the influence of multiple factors on the intervention delivery and outcome, which may limit generalizability. In spite of this, there is consensus throughout the literature that the RCT remains the gold standard because no other technique has the same power to control for selection as a threat to internal validity (Ward et al., 2003). Despite the fact that it is impossible to control for all extraneous variables and some variation in the intervention itself, a comprehensive, well-structured allocation scheme, intervention and study protocol can provide a basis for establishing a sound clinical trial.

Sidani et al. (2003) purported that, "effectiveness studies are undertaken to evaluate the effects of interventions in achieving desired outcomes when tested in real world conditions" (p. 244). The goal of clinical effectiveness research is to ascertain the best outcomes in terms of treatment effect based on the real world or life experience. "An incorrectly or selectively specified intervention is likely to produce invalid inferences about effectiveness" (Wolff, 2000, p. 107). It is critical that all aspects of the protocol be clearly delineated and adhered to in order to minimize bias, establish internal validity, and generalizability of study findings. Social support interventions are hard to define and measure precisely due to the variance that can occur within the supportive relationship. The fact that the researcher has little to no control over the actual intervention leaves only the practicalities associated with the implementation of the intervention that can be controlled.
Explicit efforts must be made to ensure optimal design with regard to blinding, randomization, adherence to intervention and study protocol, data quality and peer training.

*Operational Basis of the Intervention*

*Peer Volunteer Training*

The investigator amended and further developed a peer volunteer training manual that had been used previously in a postpartum study population (Dennis, 2001). The training manual was used as the primary resource for the peer volunteer training sessions that were conducted with all peer volunteers. In order to maintain the complement of peer volunteers (during absences for vacation/holidays, family/personal issues), it was necessary to hold several separate training sessions. However, 3 peer volunteers were able to continue to provide telephone peer support from a distance (wintering in Florida) while using a calling card (provided by the investigator).

Peer volunteers completed a 2.5-hour peer-training workshop that included: an overview of the peer volunteer role, qualities, skills and expectations. The volunteers were provided with explicit direction regarding: therapeutic supportive counselling; intervention; skill development (listening, reflection, open ended questions, problem solving and exploring options); conflict management; establishing contact with a peer; maintaining contact; identifying emergent situations; and referral to a professional when beyond peer scope. Opportunities for role-playing (in-person and via teleconference) were facilitated during this workshop and each volunteer received a peer training manual. Each volunteer was instructed to maintain a log of calls that occurred over the duration of the peer support experience (6 weeks post-discharge).
The recruitment of peer volunteers was facilitated through the use of the in-hospital visiting program such as 'Mended Hearts, Incorporated (Inc.)' and the Toronto Cardiac Rehabilitation Institute (TRI). The investigator presented the potential peer volunteers with an overview of the purpose of the study, necessary time commitment, and ethical considerations before seeking informed consent. All peer volunteers who consented to involvement in this study were already screened through the application process for Mended Hearts or through the intake screening at the TRI.

Mended Hearts, Inc. is a non-profit, in-hospital, visiting program with the purpose of providing an organized activity that renders quality support and encouragement to heart patients and their families (The Mended Hearts, Inc., 1994). This program is a volunteer organization that originated in Dallas, Texas and has expanded to include chapters throughout the United States and Canada. The local chapter in Sudbury has been in place for over ten years. The application and accreditation process for Mended Hearts Inc. includes the following criteria:

1) Application process (candidates must be individuals who have experienced heart surgery or cardiac procedure(s)(i.e. Angioplasty);

2) Visitor candidates training workshop (3-4 hours duration, which includes overview of program and visitor duties, rules of conduct, visitor etiquette, communication skills, role playing and step-by-step training plan);

3) Post-training supervision (by an assigned accredited visitor) for 3 months after accreditation;

4) Yearly re-accreditation.
Spouses or other family members may also be eligible to become visitors through successful completion of the training and accreditation program.

The ‘Mended Hearts’ volunteers had previously completed a training program, however an additional training session (conducted by the ACNP investigator) was provided for all volunteers which included:

a) Overview the study purpose, role of the peer volunteer, overview of post-discharge needs and telephone follow up

b) Include explicit direction regarding: therapeutic supportive counselling, intervention, skill development (listening, reflection, open ended questions, problem solving and exploring options), conflict management, establishing contact with a peer, maintaining contact, identifying emergent situations, and referral to a professional when beyond peer scope;

c) Opportunities for role playing (e.g. types of questions to expect, actions if medical issues were of concern, difficult conversations), if necessary.

A peer volunteer training manual was provided that consisted of: 1) an introduction to the study and research team (contact information, confidentiality agreements, demographic data form, call template); 2) an overview of the conceptual and operational premises of peer support (emotional, informational, appraisal/affirmation support); 3) effective telephone communication strategies, components of effective listening, the sharing of a lived experience; 4) problem solving and identification, common questions to expect, as well as chosen algorithms to guide problem solving in providing support after discharge from hospital. (see Appendix F for peer volunteer ‘red flag’ and ‘emergent’ algorithms); 5) information regarding dispelling the myths of CABG surgery recovery (psychosocial and
physiological recovery and norms) and strategies to encourage cardiac rehabilitation attendance. Peer volunteers received an honorarium at the completion of the study.

Peer volunteers provided support through telephone follow up once patients were discharged from hospital. Peer support incorporates components such as informational, appraisal (feedback), instrumental and emotional assistance that is provided by an individual who possesses experiential knowledge and shared previous experience. Emotional support has been identified as one of the most important subcomponents of social support due to the esteem enhancing nature. The presence of the peer supporter provided the subject with a similar other who could listen and/or provide empathetic support and self-efficacious feedback. The sharing of the normalizing of experiences (for example, emotional responses, day to day progress, including fatigue, activity, sleep, wound healing, appetite, etc) would be considered a component of informational support that the peer supporter may have provided. Peer volunteers were instructed regarding any issues that may have arose relating to medical problems requiring professional follow up. Any medical concerns (red flags) were referred to the nurse practitioner and/or emergency services.

Data Collection Timing for Participants and Follow up with Peer Volunteers

Participants and peer volunteers were contacted by a member of the research team throughout the 12-weeks of the study. Study participants were contacted at 6-weeks and 12-weeks post-discharge time by telephone. They were asked to complete the BDI-II, SSSS, PSRRQ, and PSEI at the scheduled times. The peer volunteers were contacted at 3 weeks into their assignment to provide support (more often, if necessary) and ensure study protocol adherence.
Peer volunteers made their initial contact with participants within the first 3 to 4 days after discharge from hospital and then once a week for a period of 6 weeks. The peer volunteers had a call template upon which to guide their telephone interaction. Participants were contacted weekly by the peer volunteer during the first 5 weeks of recovery at home (6 weeks post-discharge). The first 6 weeks of recovery from CABG surgery have been identified as most difficult from both the psychosocial and physiological perspective (Gillis et al., 1993; Gortner & Jenkins, 1990; Redeker, 1992). Therefore, considering early recovery timing in conjunction with similar follow up in previous studies (Parent & Fortin, 2000; Rymaszewska et al., 2003; Timberlake et al., 1997), the timing and duration of the intervention (6 weeks of peer support) and follow up (12 weeks) period were chosen. Each peer volunteer maintained a log of contact, discussion and any events, suggestions, advice or referral that occurred during or as a result of the interaction.

**Professional Guidance – Acute Care Nurse Practitioner**

The ACNP’s (investigator) role was to provide resource support for peer volunteers and participants in the situations where the peer felt the situation was beyond their scope. The peer support protocol included directions for the peer volunteer to call 911, should he identify a participant that required emergent follow up. However, if the peer volunteer identified an issue of a less urgent nature, the peer contacted the ACNP (investigator) immediately via phone call/pager. The ACNP (investigator) then established contact with the participant and advised accordingly. The role of the ACNP (investigator) was to field concerns, assess the issue and then advise appropriate follow up. Any medical concerns requiring follow up were referred to the appropriate health care professional. ACNP (investigator) instructions that were provided were documented and a follow up phone call
(next day) was made to the patient and/or family contact in order to ensure patient safety and medical follow up (see Appendix G for ACNP algorithms). The ACNP (investigator) maintained a log consisting of all telephone calls, notations, follow up and outcomes. The peer volunteers contacted the ACNP (investigator) for fielding of participants' 'red flag' questions (such as medical questions regarding wound healing and drainage, medications, dizziness, swelling of ankles, fever) (N=20 calls). Furthermore, the ACNP (investigator) was also available (via pager 24 hrs/7 days a week) to research staff in case of high BDI-II scores (≥ 14) during follow up contact with participants at 6 and 12 weeks.
Procedures

Sample Access

The stakeholders (see earlier) were made aware of the purpose of the study, anticipated outcomes as well as the roles of the peer volunteer and the ACNP (investigator). Once ethics approval (from the Conjoint Health Research Ethics Board, University of Calgary, Sudbury Regional Hospital, Memorial site, Sunnybrook and Women’s Health Sciences Centre, and Southlake Regional Health Centre) was granted, the investigator sought written consent from peer volunteers (who had already indicated their interest) and training of these volunteers was initiated (see Appendix D for peer volunteer informed consent and confidentiality agreement). Once a preliminary pool of peer volunteers was established (approximately 10 peer volunteers), participant recruitment at each site commenced. However, peer volunteer recruitment continued periodically throughout the course of the study due to group attrition (related to illness, travel and/or family responsibilities).

Potential participants for this study were identified according to the inclusion/exclusion criteria previously described. The investigator and/or assistant worked with the Clinical Manager at the study sites in order to obtain access to potential participants. The investigator and/or assistant met with the potential participants on postoperative day four or five. At this time, the purpose of the study, necessary time commitment and ethical issues (related to voluntary nature and confidentiality) were explained and informed consent was sought (see Appendix E for participant informed consent). Participants were asked if they were interested in a post-discharge peer support intervention. The participants who consented to participate in a post-discharge peer support intervention were randomly assigned to either
a control group (conventional care) or to a telephone peer support group (conventional care plus telephoned-based peer support post-discharge).

All participants completed the pre-intervention questionnaires (BDI-II, SSSS and EIQ) at the time of recruitment. Participants assigned to the intervention group were matched to their peer volunteer based on age only. Participants in the intervention group received weekly telephone follow up by a peer volunteer for five weeks after surgery (for a total 6 weeks post-discharge). Whittemore et al. (2000) identified that timing and strength are key in establishing well-defined intervention studies. Six to eight weeks post-cardiac surgery has been identified as the most critical time in terms of recovery and support in this patient population (Gilliss et al., 1993). After this period, the frequency of telephone contact was negotiated between the peer volunteer and participant.

Data Analysis

The Statistical Package for the Social Sciences (SPSS, version 16.0) (Nie, Hull, Jenkins, Steinbrenner & Bent, 2007) was used to analyze quantitative data. The level of significance for the calculations was set at 0.05. Data were collected initially at the beginning of the study (discharge) and at 6 and 12 weeks follow up in each study arm.

Descriptive statistics were used to summarize the data. Frequencies were used to provide a general description of the sample demographics and clinical characteristics (i.e. age, living arrangements, previous education, extent of disease, risk factors, surgical procedure, etc.). The scores of the Beck Depression Inventory-II, the Shortened Social Support Scale and the Peer Support Evaluation Inventory were reported as the mean score of the available sources identified. Otherwise, questionnaire responses were reported by
proportion of participants by category, yes/no or to degree of response. All null hypotheses were assessed at an alpha level of 0.05 and statistical tests are described below.

For the research question “What is the effect of a professionally-guided peer support intervention on postoperative depression?” Two-sample, two-sided t-tests were used to compare the categorized data of depression scores between the control and intervention group at three separate times (discharge and in follow up at 6 and 12 weeks). Further comparisons between groups over time (the control and intervention arms) were facilitated through the use of repeated-measures analysis of variance (ANOVA).

For the research question “What is the effect of a professionally-guided peer support intervention on perceptions of recovery?” Chi-square was used to compare binary data responses on the PSRRQ between the control and intervention groups at three separate times (discharge and follow up at 6 and 12-weeks). Individual questions were analyzed independently. In addition, the t-test (a parametric analysis technique) was used to determine significant differences between measures of the two samples (control and intervention group) in components of the PSRRQ that utilized a 0-10 scoring system (i.e. health state, life satisfaction). The mean scores for each question were analyzed and reported independently. Further comparisons between groups (i.e. mean scores of discomforts at baseline, 6 and 12 weeks) over time were facilitated through the use of repeated-measures ANOVA.

For the research question, “What is the effect of a professionally-guided peer support intervention on perceptions of social support?” The two-sample, two-sided t-test was used to determine statistical significance between the mean support scores from all sources identified on the shortened social support scale, at discharge, and 6 and 12-weeks follow up. Repeated-
measures ANOVA was used to determine differences between the two groups (control and intervention arm) over the time period of study.

For the research question “What is the effect of a professionally-guided peer support intervention on health services utilization following CABG surgery?” Repeated-measures ANOVA was used to determine differences between each group with respect to total number of visits to Emergency, visits to physician(s), visits to nurse practitioner, visits to related health care professionals, and hospital readmission.

For the research question “What are the perceptions of the participants who received the professionally-guided peer support intervention?” Frequencies were used to compare interval level data of PSEI scores (of 1 to 5) in the intervention group at the completion of the study (one time only). Each of the four subscales was assessed independently and reported with separate scores for each. Pearson correlation coefficients were used to assess the relationships between each of the PSEI four subscales (i.e. supportive interactions, relationship qualities, perceived benefits and satisfaction with support received).

Further, linear regression was used to derive a predictive model of depression based upon social (peer) support as a predictive factor (for the control and experimental arms of the study). Linear regression is a form of regression analysis, which allows researchers to examine the relationship between one or more independent variables (such as age, living alone, education, social support and other possible predicting variables) and a continuous dependent variable (such as depression) (Kleinbaum, 1994; Tabachnick & Fiddell, 2001). The resulting model provides unique information about the nature of the linear relationship between the dependent and independent variables as well as the strength, variance and direction of each (positive, negative, inverse). Therefore, the ability to predict the likelihood
of being depressive given that an individual had one or more identified risk variables present was possible with a linear regression model.

**Missing Data Plan**

In order to ensure consistency, plans were made to match any missing data observations to those of a similar participant based on age, marital status and group assignment (intervention/control). If a participant was unavailable for two of the three follow up interviews, no data substitution took place and this participant was not used for follow up analysis.

**Sample Size**

Sample size was determined based on power analysis for analysis of the primary question. In order to calculate the sample size for this study the following assumptions were made:

1) The rate of depression in the professionally guided peer support group would be 25% (Rymaszewska et al., 2003; Blumenthal et al., 2003)

2) The rate of depression in the control group would be 50% (Timberlake et al., 1997; Pirraglia et al., 1999; Burg et al., 2003b)

3) The significance level would be set at $\alpha = .05$

4) The power would be set at $1 - \beta = .80$

5) With 2.5:1 ratio of control to experimental (peer support) group

The unmatched approach (2.5 control to 1 intervention participant) best suited the purpose of this study considering the timing and nature of the social support intervention and the necessity to maximize the efficiency or power of the primary comparison. Treatment allocation in clinical trials is characterized by active control of the treatments and the process
used to make assignments (Piantadosi, 1997). In the setting of a complicated intervention administration, unequal group size enabled the investigator to minimize the time costs associated with implementation of the intervention but also facilitated optimal power and control in the study. The sample size was calculated using Fleiss’ (1981, p. 45) formula below.

$$m' = \frac{[c_{a/2} \sqrt{(r+1)PQ} - c_{1-\beta} \sqrt{r(P_1Q_1 + P_2Q_2)}]^2}{r(P_2 - P_1)^2}$$

$$m = m' + \frac{r + 1}{r|P_2 - P_1|}$$

Where:

- \(P = (P_1 + rP_2)/(r+1)\) and \(Q = 1 - P\)

- \(m'\) = size of sample from population 2 (intervention group)
- \(m\) = size of sample from population 1 (control group)
- \(P_1\) = the proportion of factor in population 1
- \(P_2\) = the proportion of factor in population 2
- \(1-\beta\) = power: chance of detecting a real difference
- \(\alpha\) = chance of falsely declaring the two proportions to differ
- \(c_{\alpha/2}\) = the value cutting off the proportion \(\alpha/2\) in the upper tail of the standard normal curve
- \(c_{1-\beta}\) = the value cutting off the proportion \(1-\beta\) in the upper tail and \(\beta\) in the lower tail of the standard normal curve
- \(r\) = the ratio of sample sizes \((n_2/n_1)\)
- \(Q = 1 - P\) (derivation)

Under the assumptions listed above, the calculation indicated that the required sample size for the control group was 115 and the intervention group was 46. Allowing for a drop out rate of approximately 10% (which was consistent with other studies of this nature (King & Gortner, 1996; King, 2000)) the minimum sample size was 126 for the control group and 51 for the intervention group.

**Ethical Considerations**
There may have been some possible discomforts from participating in this study; the participants may have found the completion of the questionnaires and telephone discussion tiring. The participants were advised that they may decline to answer any questions at any time. Study participants were informed of the voluntary nature of the study, the confidentiality of their responses and their right to withdraw at any time without jeopardy. Confidentiality regarding the nature of the peer-participant relationship was maintained; each volunteer completed a confidentiality agreement (which included a clause regarding the professional nature of this relationship during the study). The professional nature of the peer-participant relationship was maintained at all times. The investigator and/or assistant contacted peer volunteers regularly (week 3 and when necessary) during the study in order to provide necessary support to peer volunteers. If a situation arose regarding the professional nature of a relationship, the investigator was available for peer consultation.

In an effort to ensure peer volunteer and participant safety, each peer volunteer was provided with a pager number for ACNP (investigator) contact. The peer volunteer initiated weekly contact during the 5-weeks post discharge from hospital, however contact between the participant and peer may have occurred more frequently during the study period. If the participant wished to contact the peer volunteer at times other than the weekly scheduled period, the participant was instructed to use the paging system for contact. Peer volunteers were not required to distribute their home telephone contact number.

Study data were kept confidential by replacing names on measures with an assigned code number. The linkage between the code number and participant on code sheets was only available to the investigator. The code sheets were stored in a separate locked cabinet apart
from the collected data. Any reference or description that may have identified the participant was excluded from any final reporting or discussion of data results.
CHAPTER 4

RESULTS

Sample

Four hundred and seventy-eight (see Figure 3) potential patients were screened for inclusion over the 16-month recruitment period. Of these potential participants, 282 men met inclusion criteria. The most common reasons for ineligibility (n=196) included language barrier, concomitant valve surgery and significant postoperative complications. Of the 282 eligible participants, 95 declined participation; citing sufficiency of social support or disinterest in study participation. Thus, 40% of screened patients met eligibility criteria.

Figure 3 - Consolidated Standards of Reporting Trials (CONSORT) Algorithm
Withdrawals

Overall, 15 participants (8 intervention arm; 7 control arm) withdrew or were withdrawn from the study. Those assigned to the intervention arm; one participant incurred a postoperative complication and increased length of hospital stay; 6 withdrawals occurred following discharge from hospital and as a result of participant request; and one participant was withdrawn by the ACNP (investigator) due to English language comprehension issues that became apparent after recruitment.

Of the 7 withdrawals in the control arm, 6 were withdrawn due to participant request. One participant was withdrawn by the ACNP (investigator) due to English language difficulties.

Patients Lost to Follow-up

Of the 209 men enrolled into the trial, four participants were lost follow-up (2.0%), and thus, not included in data analysis. All four participants were in the control arm of the study. Numerous telephone attempts to contact these individuals were unsuccessful (toll-free call back number and messages were left) and resulted in the removal of the participant from the database.

Data Collection

Participants in this study were recruited on postoperative day three or four after undergoing traditional urgent or elective CABG surgery. At the time of recruitment, demographic and psychosocial data (Expectation Inventory Questionnaire (EIQ), Beck Depression Inventory (BDI-II), Shortened Social Support Scale (SSSS)) were collected in-person by the investigator or research assistant. Other demographic and clinical data were derived from the health record audit, which was completed once the participant was
discharged from hospital. Thereafter, follow-up data were collected at 6 and 12 weeks post-discharge using the Postoperative Self-Report of Recovery Questionnaire (PSRRQ), the SSSS and the BDI-II. Participants in the intervention arm of the study also completed the Peer Support Evaluation Inventory (PSEI) upon study completion at 12 weeks.

The study questionnaires and measures yielded both numerical data from the structured questions, as well as non-numerical data from open-ended questions. The numerical data were examined statistically to describe the sample and determine if a professionally guided peer support intervention had an effect on postoperative depression in male patients recovering from CABG surgery. The non-numerical data were collated using manifest content analysis, which entails quantification of narrative data into categories based on preconceived ideas regarding analysis. Evident patterns were then summarized in conjunction with quantitative data. The sample will be described through analysis of demographic and clinical data, reasons for having cardiac surgery, preoperative cardiac status, health history and other discharge data including expected benefits of having CABG surgery.

Sample Characteristics

The demographic information that participants provided at discharge are outlined in Table 1. There were no significant differences found between the intervention and control group with respect to sample characteristics. Approximately 72% of the sample had completed high school education or greater. The majority of participants were married and living with their spouse (86.5%), while 7.3% lived alone. Participants in the ‘other’ category consisted of individuals who were staying with friends (4.3%) or at an inpatient rehabilitation facility (4.5%) after discharge from hospital. While 49.2% of the participants identified
themselves as retired or semi-retired, 45.1% were working full-time prior to surgery. Of those who responded, 43% cited an annual household income of greater than $60,000 Canadian.

Table 1 - Demographic Characteristics of the Sample Undergoing CABG surgery

<table>
<thead>
<tr>
<th>N</th>
<th>Variable</th>
<th>Total</th>
<th>Intervention</th>
<th>Control</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>185</td>
<td>61</td>
<td>124</td>
<td></td>
</tr>
<tr>
<td>Age, years</td>
<td>Mean age ± SD</td>
<td>63.53 (10.4)</td>
<td>63.6 (9.93)</td>
<td>63.4 (10.7)</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>Range</td>
<td>36-87</td>
<td>36-87</td>
<td>37-85</td>
<td></td>
</tr>
<tr>
<td>Living Arrangements</td>
<td>With Spouse</td>
<td>161 (87.0%)</td>
<td>52 (85.2%)</td>
<td>109 (87.9%)</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>With Family Member</td>
<td>1 (1.6%)</td>
<td>1 (1.6%)</td>
<td>2 (1.6%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alone</td>
<td>13 (7.0%)</td>
<td>5 (8.2%)</td>
<td>8 (6.5%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>8 (4.4%)</td>
<td>3 (4.9%)</td>
<td>5 (4.0%)</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>Grade School or less</td>
<td>19 (10.3%)</td>
<td>4 (6.6%)</td>
<td>15 (12.1%)</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>Some High School</td>
<td>34 (18.3%)</td>
<td>8 (13.2%)</td>
<td>26 (21.0%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High School Graduate</td>
<td>34 (18.4%)</td>
<td>13 (21.3%)</td>
<td>21 (16.9%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Some Post-Secondary</td>
<td>21 (11.4%)</td>
<td>8 (13.1%)</td>
<td>13 (10.5%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post-Secondary Grad</td>
<td>52 (28.1%)</td>
<td>20 (32.8%)</td>
<td>32 (25.8%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Graduate Degree</td>
<td>25 (13.5%)</td>
<td>8 (13.1%)</td>
<td>17 (13.7%)</td>
<td></td>
</tr>
<tr>
<td>Work Status</td>
<td>Working Full-time</td>
<td>85 (45.9%)</td>
<td>26 (42.7%)</td>
<td>59 (47.5%)</td>
<td>0.79</td>
</tr>
<tr>
<td></td>
<td>Retired, semi-retired</td>
<td>90 (48.6%)</td>
<td>31 (50.8%)</td>
<td>59 (47.5%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disability</td>
<td>5 (2.7%)</td>
<td>2 (3.3%)</td>
<td>3 (2.4%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unemployed</td>
<td>5 (2.7%)</td>
<td>2 (3.2%)</td>
<td>3 (2.4%)</td>
<td></td>
</tr>
<tr>
<td>Plan to return to work after surgery:</td>
<td>Yes</td>
<td>75 (40.6%)</td>
<td>23 (37.7%)</td>
<td>52 (41.9%)</td>
<td>0.54</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>98 (52.9%)</td>
<td>34 (55.7%)</td>
<td>64 (51.6%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unsure</td>
<td>12 (6.5%)</td>
<td>4 (6.5%)</td>
<td>8 (6.4%)</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>&lt; $20,000 annually</td>
<td>4 (2.2%)</td>
<td>2 (3.3%)</td>
<td>2 (1.6%)</td>
<td>0.68</td>
</tr>
<tr>
<td></td>
<td>$20,000-$59,999</td>
<td>72 (38.9%)</td>
<td>26 (42.7%)</td>
<td>46 (37.1%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;$60,000</td>
<td>79 (42.8%)</td>
<td>27 (44.3%)</td>
<td>52 (41.9%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Declined answer</td>
<td>30 (16.2%)</td>
<td>6 (9.9%)</td>
<td>24 (19.4%)</td>
<td></td>
</tr>
</tbody>
</table>
Health History and Medical History Data

Descriptors of admission symptoms, medical history, coronary risk factors and Canadian Cardiovascular Society (CCS) functional status are summarized in Table 2. In addition, extent of vessel disease, the number and type of bypass conduits used, and cardiopulmonary bypass pump time were also included. On the whole, there were no significant differences between groups with respect to health history and medical history data (Table 2).

The majority of participants were admitted with CCS Class II and III functional angina and accompanying symptoms of shortness of breath and fatigue. Over 80% of the sample had grade 1 or grade 2 left ventricular ejection fraction. Approximately 51% of study participants had a previous history of myocardial infarction while 26.4% had undergone percutaneous coronary intervention (PCI). Notably, less than 5% of the total sample were identified as having a history of clinical depression.

Approximately 70% of participants presented with coronary blockages affecting the LAD, while 64% had significant RCA disease, and 58% had circumflex disease. Ninety percent of participants received two, three, or four bypass grafts. Internal mammary artery conduits were used in 91.3% of participants, saphenous vein in 84.8%, and radial artery in 27.5%. The average length of stay in hospital ranged from five to seven days (70.2%) overall.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Total N (185)</th>
<th>Intervention N (61)</th>
<th>Control N (124)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Admission Symptoms</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angina</td>
<td>146 (78.9%)</td>
<td>45 (73.8%)</td>
<td>101 (81.5%)</td>
<td></td>
</tr>
<tr>
<td>SOB</td>
<td>121 (65.4%)</td>
<td>36 (59.0%)</td>
<td>85 (68.5%)</td>
<td></td>
</tr>
<tr>
<td>Fatigue/Weakness</td>
<td>116 (62.7%)</td>
<td>35 (57.4%)</td>
<td>81 (65.3%)</td>
<td></td>
</tr>
<tr>
<td>Syncope</td>
<td>14 (7.5%)</td>
<td>2 (3.3%)</td>
<td>12 (9.7%)</td>
<td></td>
</tr>
<tr>
<td>PND</td>
<td>8 (4.3%)</td>
<td>1 (1.6%)</td>
<td>7 (5.6%)</td>
<td></td>
</tr>
<tr>
<td>Asymptomatic</td>
<td>32 (17.2%)</td>
<td>12 (19.7%)</td>
<td>20 (16.1%)</td>
<td>0.20</td>
</tr>
<tr>
<td><strong>LV Ejection Fraction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 1 &gt; 50%</td>
<td>84 (45.4%)</td>
<td>29 (47.5%)</td>
<td>55 (44.3%)</td>
<td>0.70</td>
</tr>
<tr>
<td>Grade 2 40-49%</td>
<td>65 (35.1%)</td>
<td>23 (37.7%)</td>
<td>42 (33.8%)</td>
<td></td>
</tr>
<tr>
<td>Grade 3 30-39%</td>
<td>24 (12.9%)</td>
<td>6 (9.8%)</td>
<td>18 (14.5%)</td>
<td></td>
</tr>
<tr>
<td>Grade 4 &lt; 30%</td>
<td>5 (2.7%)</td>
<td>2 (3.2%)</td>
<td>3 (2.4%)</td>
<td></td>
</tr>
<tr>
<td><strong>CCS Classification</strong></td>
<td></td>
<td></td>
<td></td>
<td>0.09</td>
</tr>
<tr>
<td>Class I</td>
<td>8 (4.3%)</td>
<td>4 (6.5%)</td>
<td>4 (3.2%)</td>
<td></td>
</tr>
<tr>
<td>Class II</td>
<td>40 (21.6%)</td>
<td>14 (22.9%)</td>
<td>26 (20.9%)</td>
<td></td>
</tr>
<tr>
<td>Class III</td>
<td>49 (26.4%)</td>
<td>11 (18.0%)</td>
<td>38 (30.6%)</td>
<td></td>
</tr>
<tr>
<td>Class IV</td>
<td>33 (17.8%)</td>
<td>13 (21.3%)</td>
<td>20 (16.1%)</td>
<td></td>
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<tr>
<td><strong>Medical History</strong></td>
<td></td>
<td></td>
<td></td>
<td>0.71</td>
</tr>
<tr>
<td>CHF</td>
<td>11 (5.9%)</td>
<td>3 (4.9%)</td>
<td>8 (6.5%)</td>
<td></td>
</tr>
<tr>
<td>Previous MI</td>
<td>98 (52.9%)</td>
<td>35 (57.4%)</td>
<td>63 (50.0%)</td>
<td></td>
</tr>
<tr>
<td>Previous PCI</td>
<td>49 (26.4%)</td>
<td>15 (24.5%)</td>
<td>34 (27.4%)</td>
<td></td>
</tr>
<tr>
<td>Cancer</td>
<td>12 (6.5%)</td>
<td>4 (6.6%)</td>
<td>8 (6.5%)</td>
<td></td>
</tr>
<tr>
<td>COPD</td>
<td>14 (7.5%)</td>
<td>3 (4.9%)</td>
<td>11 (8.9%)</td>
<td></td>
</tr>
<tr>
<td>Clinical Depression</td>
<td>9 (4.8%)</td>
<td>2 (3.3%)</td>
<td>7 (5.6%)</td>
<td></td>
</tr>
<tr>
<td>Sleep Apnea</td>
<td>9 (4.9%)</td>
<td>2 (3.3%)</td>
<td>7 (5.6%)</td>
<td></td>
</tr>
<tr>
<td>PVD</td>
<td>10 (5.4%)</td>
<td>2 (3.3%)</td>
<td>8 (6.5%)</td>
<td></td>
</tr>
<tr>
<td><strong>Coronary Risk Factors</strong></td>
<td></td>
<td></td>
<td></td>
<td>0.45</td>
</tr>
<tr>
<td>Hypertension</td>
<td>134 (72.4%)</td>
<td>43 (70.5%)</td>
<td>91 (73.4%)</td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>55 (29.7%)</td>
<td>18 (29.5%)</td>
<td>37 (29.8%)</td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td>64 (34.5%)</td>
<td>21 (34.4%)</td>
<td>43 (34.7%)</td>
<td></td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>152 (82.1%)</td>
<td>50 (81.9%)</td>
<td>102 (82.3%)</td>
<td></td>
</tr>
<tr>
<td>Family History of CAD</td>
<td>101 (54.5%)</td>
<td>27 (44.3%)</td>
<td>74 (59.7%)</td>
<td></td>
</tr>
</tbody>
</table>
Table 2 cont’d – Health History and Medical History Data

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total N (185)</th>
<th>Intervention N (61)</th>
<th>Control N (124)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent of Vessel Disease</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left main ≥ 70 %</td>
<td>45 (24.3%)</td>
<td>19 (31.1%)</td>
<td>26 (21.0%)</td>
<td>0.79</td>
</tr>
<tr>
<td>LAD ≤ 70 %</td>
<td>129 (69.7%)</td>
<td>44 (72.1%)</td>
<td>85 (68.5%)</td>
<td></td>
</tr>
<tr>
<td>Circumflex ≥ 70%</td>
<td>108 (58.3%)</td>
<td>35 (57.4%)</td>
<td>73 (58.9%)</td>
<td></td>
</tr>
<tr>
<td>RCA ≥ 70%</td>
<td>119 (64.3%)</td>
<td>41 (67.2%)</td>
<td>78 (62.9%)</td>
<td></td>
</tr>
<tr>
<td>Conduits/bypass grafts used</td>
<td></td>
<td></td>
<td></td>
<td>0.93</td>
</tr>
<tr>
<td>&lt;2 grafts</td>
<td>6 (3.2%)</td>
<td>2 (3.3%)</td>
<td>4 (3.2%)</td>
<td></td>
</tr>
<tr>
<td>2-4 grafts</td>
<td>168 (90.8%)</td>
<td>56 (91.8%)</td>
<td>112 (90.3%)</td>
<td></td>
</tr>
<tr>
<td>&gt;4 grafts</td>
<td>11 (5.9%)</td>
<td>3 (4.9%)</td>
<td>8 (6.5%)</td>
<td></td>
</tr>
<tr>
<td>Internal Mammary</td>
<td>169 (91.3%)</td>
<td>53 (86.9%)</td>
<td>116 (93.5%)</td>
<td></td>
</tr>
<tr>
<td>Saphenous</td>
<td>157 (84.8%)</td>
<td>50 (82.0%)</td>
<td>107 (86.3%)</td>
<td></td>
</tr>
<tr>
<td>Radial</td>
<td>51 (27.5%)</td>
<td>21 (34.4%)</td>
<td>30 (24.2%)</td>
<td></td>
</tr>
<tr>
<td>CPB Time (minutes)</td>
<td>204.9 (range 0-238)</td>
<td>104.7 (range 0-211)</td>
<td>100.2 (range 0-238)</td>
<td>0.44</td>
</tr>
</tbody>
</table>

Post-operative Complications

Overall, there were few postoperative complications while in-hospital (Table 3).

However, atrial fibrillation, a common cardiac post surgical complication, was identified as most prevalent in both the intervention (26.2%) and control (13.7%) groups. There were no significant differences found between groups in relation to postoperative complications ($\chi^2 = 2.54$ (1df), $p=0.11$).

Table 3 - Frequency of Postoperative Complications

<table>
<thead>
<tr>
<th>Postoperative Complication</th>
<th>Incidence</th>
<th>Intervention (n=61)</th>
<th>Control (n=124)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atrial Fibrillation</td>
<td></td>
<td>16 (26.2%)</td>
<td>17 (13.7%)</td>
</tr>
<tr>
<td>Other Arrhythmia</td>
<td></td>
<td>2 (3.2%)</td>
<td>7 (5.6%)</td>
</tr>
<tr>
<td>Myocardial Infarction</td>
<td></td>
<td>0 (0%)</td>
<td>1 (0.8%)</td>
</tr>
<tr>
<td>Intra-aortic Balloon Pump</td>
<td></td>
<td>1 (1.6%)</td>
<td>1 (0.8%)</td>
</tr>
<tr>
<td>TIA (without residual effects)</td>
<td></td>
<td>2 (3.2%)</td>
<td>2 (1.6%)</td>
</tr>
<tr>
<td>Pneumothorax</td>
<td></td>
<td>6 (9.8%)</td>
<td>5 (4.0%)</td>
</tr>
<tr>
<td>Bleeding (requiring reoperation)</td>
<td></td>
<td>0 (0%)</td>
<td>1 (0.8%)</td>
</tr>
</tbody>
</table>
**Expected Benefits and Expected Recovery After Having Cardiac Surgery**

Using the EIQ, participants were asked to indicate (yes/no) whether they expected the following benefits (prolonged life, resumption of activities, improved quality of life, travel, freedom from pain/fatigue) after having CABG surgery. Table 4 represents responses at discharge.

The expected benefits of having cardiac surgery were closely ranked between both the intervention and control groups at discharge. The majority of men identified the two primary expected benefits of 'prolonged life' and 'resumption of activities' as a discharge expectation or benefit of undergoing cardiac surgery. 'Improved quality of life', 'travel', and 'freedom from pain and fatigue' also ranked highly at discharge. Non-parametric analysis revealed no significant differences in responses between groups at this time.

**Table 4 - Expected Benefits of Surgery at Discharge**

<table>
<thead>
<tr>
<th>Expected Benefit</th>
<th>All % (n/185)</th>
<th>Intervention % (n/61)</th>
<th>Control % (n/124)</th>
<th>( \chi^2 )</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prolong life</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>96.8% (179)</td>
<td>98.4% (60)</td>
<td>96.0% (119)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>3.2% (6)</td>
<td>1.6% (1)</td>
<td>4.0% (5)</td>
<td>---</td>
<td>0.66*</td>
</tr>
<tr>
<td>Resume former activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>90.8% (168)</td>
<td>91.8% (56)</td>
<td>90.3% (112)</td>
<td>0.01</td>
<td>0.89</td>
</tr>
<tr>
<td>No</td>
<td>9.1% (17)</td>
<td>8.1% (5)</td>
<td>8.8% (12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve quality of life</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>89.2% (165)</td>
<td>90.1% (55)</td>
<td>88.7% (110)</td>
<td>0.07</td>
<td>0.77</td>
</tr>
<tr>
<td>No</td>
<td>10.8% (20)</td>
<td>9.8% (6)</td>
<td>11.2% (14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Travel and Recreation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>85.4% (158)</td>
<td>86.8% (53)</td>
<td>84.6% (105)</td>
<td>0.18</td>
<td>0.67</td>
</tr>
<tr>
<td>No</td>
<td>14.6% (27)</td>
<td>13.1% (8)</td>
<td>15.3% (19)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freedom from pain and fatig</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>85.4% (158)</td>
<td>81.9% (50)</td>
<td>87.0% (108)</td>
<td>0.32</td>
<td>0.56</td>
</tr>
<tr>
<td>No</td>
<td>14.6% (27)</td>
<td>18.0% (11)</td>
<td>12.9% (16)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Fisher's Exact Test used.

Participants were also asked to subjectively rate their expected recovery as well as their current quality of life on a likert-type scale of zero (meaning minimal) to ten (meaning optimal) (see Table 5). No significant differences were found between the groups in relation to current quality of life and expected recovery. Although participants understandably ranked
their current quality of life as low before discharge (postoperative day three/four), their outlook for anticipated recovery was much higher.

Table 5 - Subjective Rating of Current Quality of Life and Expected Recovery at Discharge

<table>
<thead>
<tr>
<th>Variables</th>
<th>All M(SD)</th>
<th>Intervention M(SD)</th>
<th>Control M(SD)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current quality of life</td>
<td>6.21 (2.60)</td>
<td>6.10 (2.68)</td>
<td>6.26 (2.56)</td>
<td>0.44</td>
</tr>
<tr>
<td>Expected recovery</td>
<td>9.42 (1.08)</td>
<td>9.44 (1.21)</td>
<td>9.41 (1.01)</td>
<td>0.46</td>
</tr>
</tbody>
</table>

M=mean; SD=standard deviation

At discharge, participants were asked “What prompted you to have cardiac surgery now?” Responses were broadly categorized into two themes: urgent nature of surgery and increased symptoms resulting in activity limitations. There were a number of participants categorized as urgent surgical candidates due to a combination of factors, which included symptom severity, extent of vessel disease, and co-morbid factors (such as previous MI).

More than half of the participants (intervention = 73.8%; control = 81.5%) reported increased angina symptoms (and related symptoms such as fatigue, shortness of breath (SOB) and activity restrictions) as motivation for undergoing surgery.

Recovery Trajectory

Over the course of follow-up at 6 and 12 weeks post discharge, participants were asked to respond to the PSRRQ (to measure perceived recovery as opposed to expected recovery as measured by the EIQ at discharge). Findings will be presented together for each of the follow up periods in descriptive and table format.

Perceived Recovery

Using the PSRRQ in follow up at 6 and 12 weeks, participants were asked whether they had returned to their normal activities as well as employment (if applicable). Though few (<14%) reported returning to normal activity and cardiac rehabilitation, there were no
significant differences found between groups (Table 6). The predominant reasons given for delay in return to work at 6 weeks included: 'I tire easily', 'fatigue and lack of energy' and 'I'm just taking it easy'. At 12 weeks, more participants had returned to normal activities and were back at work, however some were still 'awaiting doctor’s approval’ to return to work.

At this time, participants were also asked whether they had started cardiac rehabilitation and 13.6% indicated they had started at 6 weeks (Fisher’s Exact Test, p=0.29). Approximately 22% of participants reported attendance at cardiac rehabilitation by week 12 of their recovery (χ² = 0.432, p=0.51). At the time of study, the norm for cardiac rehabilitation attendance was post-12 weeks.

Table 6 - Reports of Return to Normal Activity, Employment and Cardiac Rehabilitation

<table>
<thead>
<tr>
<th>Activities</th>
<th>All (%n/167)</th>
<th>6 weeks</th>
<th>12 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All (%n/167)</td>
<td>Intervention (%n/54)</td>
<td>Control (%n/113)</td>
</tr>
<tr>
<td>Normal Activity</td>
<td>Yes 13.8%(23)</td>
<td>14.8%(8)</td>
<td>13.3%(15)</td>
</tr>
<tr>
<td></td>
<td>No 86.2%(144)</td>
<td>85.2%(46)</td>
<td>86.7%(98)</td>
</tr>
<tr>
<td>Employment</td>
<td>Yes 13.8%(23)</td>
<td>14.8%(8)</td>
<td>13.3%(15)</td>
</tr>
<tr>
<td></td>
<td>No 70.0%(117)</td>
<td>64.8%(35)</td>
<td>72.6%(82)</td>
</tr>
<tr>
<td></td>
<td>N/A 16.2%(27)</td>
<td>20.4%(11)</td>
<td>14.2%(16)</td>
</tr>
<tr>
<td>Cardiac Rehab</td>
<td>Yes 6.0%(10)</td>
<td>9.3%(5)</td>
<td>4.4%(5)</td>
</tr>
<tr>
<td></td>
<td>No 94.0%(157)</td>
<td>90.7%(49)</td>
<td>95.6%(108)</td>
</tr>
</tbody>
</table>

Note: Not applicable (N/A) is indicative of retired or undecided participants.

Fisher’s Exact Test used
18 Missing Cases at 6 weeks and 28 at 12 weeks

Primary Person Assisting When Home

Participants were asked to identify their primary source of assistance at home during recovery. The majority of participants identified their spouse/significant other as the primary
source of social and emotional support (Table 7). There were no significant differences between groups (p=0.15) with respect to identified sources of support at home.

Table 7 - Identified Person Assisting When Home

<table>
<thead>
<tr>
<th>Primary Support</th>
<th>Intervention % (n=61)</th>
<th>Control % (n=124)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spouse</td>
<td>83.6%(51)</td>
<td>79.8%(99)</td>
</tr>
<tr>
<td>Sibling</td>
<td>3.2%(2)</td>
<td>4.8%(6)</td>
</tr>
<tr>
<td>Children</td>
<td>4.9%(3)</td>
<td>4.8%(6)</td>
</tr>
<tr>
<td>Friend</td>
<td>3.2%(2)</td>
<td>4.8%(6)</td>
</tr>
<tr>
<td>Other</td>
<td>4.9%(3)</td>
<td>5.6%(7)</td>
</tr>
</tbody>
</table>

Discomforts

Participants were asked to rate their level of discomfort(s) on a scale of zero (meaning ‘no pain’) to ten (meaning ‘worst pain’). Surprisingly, the reported discomforts at discharge were low in both the intervention and control groups (Table 8). Interestingly, participants in the intervention group reported significantly higher levels [t (65.3) = 2.29, p=0.03] of leg incision discomfort at 12 weeks. Otherwise, there were no significant differences between groups in chest incision, leg incision or arm incision pain. All but arm incision pain improved significantly over time (p=0.07). There were no differences found between groups in degree of improvement over time for chest, leg or arm incisions (chest F(1,505)=0.38, p=0.54; leg F(1,463)=2.69,p=0.10; arm F(1, 145)=0.03, p=0.87).
Table 8 - Incision Discomforts at Discharge and 6 and 12 weeks Post-Discharge

<table>
<thead>
<tr>
<th></th>
<th>Discharge (M (SD))</th>
<th>6-weeks (M (SD))</th>
<th>12-weeks (M (SD))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>p</td>
</tr>
<tr>
<td>Chest Incision</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>3.04(2.11)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>2.89(1.95)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>3.12(2.19)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>0.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>2.48(2.07)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>2.39(1.95)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>2.53(2.13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>0.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>1.80(2.06)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>1.84(2.17)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>1.78(2.02)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>0.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leg Incision</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>2.08(2.21)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>2.05(2.00)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>2.09(2.31)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>0.93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>1.64(2.07)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>2.00(2.12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>1.48(2.03)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>0.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>1.06(1.70)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>1.59(1.99)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>0.82(1.50)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>0.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arm Incision</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>2.40(1.95)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>2.65(1.98)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>2.24(1.95)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>0.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>1.77(2.08)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>2.06(2.26)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>1.60(1.97)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>0.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>1.60(2.16)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>1.94(1.95)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>1.40(2.28)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>0.40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

M=mean; SD=standard deviation
Missing Cases due to missing responses and/or variability in surgical procedure; 16 missing cases at 6 weeks, 27 at 12 weeks
Realized Expectations after Cardiac Surgery

The majority of participants perceived that they had realized benefits from having cardiac surgery. Participants were asked to identify the realized benefits of having cardiac surgery, relative to their responses at discharge. Both groups reported benefits that included, 'prolonged life' (Fisher’s Exact Test, \( p = 0.44 \)) and 'improved quality of life' (\( \chi^2 = 0.0638, p=0.80 \)) although there were no statistically significant differences between groups at 12 weeks post-discharge (Table 9).

Table 9 - Chi Square Analysis - Realized Benefits of Surgery at 12 weeks

<table>
<thead>
<tr>
<th>Realized Benefit</th>
<th>All</th>
<th>Intervention</th>
<th>Control</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% (n/156)</td>
<td>% (n/49)</td>
<td>% (n/107)</td>
<td></td>
</tr>
<tr>
<td>Prolong life</td>
<td>Yes</td>
<td>93.6%(146)</td>
<td>98.0%(48)</td>
<td>91.6%(98)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>6.4%(10)</td>
<td>2.0% (1)</td>
<td>8.4%(9)</td>
</tr>
<tr>
<td>Resume former activities</td>
<td>Yes</td>
<td>71.1%(111)</td>
<td>67.3%(33)</td>
<td>73.0%(78)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>28.8%(45)</td>
<td>33.0%(16)</td>
<td>27.1%(29)</td>
</tr>
<tr>
<td>Improve quality of life</td>
<td>Yes</td>
<td>80.8%(126)</td>
<td>80.0%(39)</td>
<td>81.3%(87)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>19.2%(30)</td>
<td>20.4%(10)</td>
<td>18.7%(20)</td>
</tr>
<tr>
<td>Travel and Recreation</td>
<td>Yes</td>
<td>72.4%(113)</td>
<td>73.4%(36)</td>
<td>72.0%(77)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>27.6%(43)</td>
<td>27.0%(13)</td>
<td>28.0%(30)</td>
</tr>
<tr>
<td>Freedom from pain and fatigue</td>
<td>Yes</td>
<td>75.6%(118)</td>
<td>77.5%(38)</td>
<td>74.8%(80)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>24.4%(38)</td>
<td>22.4%(11)</td>
<td>25.2%(27)</td>
</tr>
</tbody>
</table>

^aFisher’s Exact Test used.
29 Missing Cases

At 12-weeks post-discharge, participants were asked “If you were to consider having surgery again, would you choose it?” There were no significant differences found between groups (Fisher’s exact test, \( p = 0.99 \)). The majority of patients responded positively to this question. At the time, participants were given an opportunity to provide reasons for their response. The most common positive reasons given included, “gave me a new lease on life”, “quality of life has improved drastically”, “a positive attitude aids in recovery”, and “being aware of support network was an important part of the healing process”. Among the few
participants who responded negatively, some of the reasons included, “I felt unprepared”,
“felt I was pushed into surgery by my family” and “I wish I had more education prior to surgery”.

Participants were also asked, “Are you satisfied with your decision to have surgery?”

Statistical analysis of the responses revealed that there were no differences between groups with overall satisfaction of the decision to have surgery. The majority of participants were satisfied with their surgical decision (Intervention = 94.0%; Control = 93.0%) (Table 10).

<table>
<thead>
<tr>
<th>Question</th>
<th>All (%(n/156))</th>
<th>Intervention (%(n/50))</th>
<th>Control (%(n/106))</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgery again?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>91.7%(143)</td>
<td>92.0%(46)</td>
<td>91.5%(97)</td>
<td>0.99</td>
</tr>
<tr>
<td>No</td>
<td>8.3%(13)</td>
<td>8.0%(4)</td>
<td>8.4%(9)</td>
<td></td>
</tr>
<tr>
<td>Satisfied with Decision?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>96.8%(151)</td>
<td>96.0%(48)</td>
<td>97.1%(103)</td>
<td>0.99</td>
</tr>
<tr>
<td>No</td>
<td>3.2%(5)</td>
<td>4.0%(2)</td>
<td>2.8%(3)</td>
<td></td>
</tr>
</tbody>
</table>

29 Missing Cases

At 12 weeks post-discharge, participants were asked to subjectively rate their realized quality of life and realized recovery (relative to rating upon discharge). Respondents rated these variables on a likert-type scale of zero (meaning minimal) to ten (meaning optimal) (Table 11). There were no significant differences found between groups on any variables at this time, although most participants rated their realized quality of life much higher than discharge. Interestingly, realized recovery was rated lower at 12 weeks than at discharge in both the intervention and control groups.
Table 11 - Subjective Rating of Realized Quality of Life and Realized Recovery at 12 weeks

<table>
<thead>
<tr>
<th>Variables</th>
<th>All</th>
<th>Intervention</th>
<th>Control</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realized quality of life</td>
<td>8.32(1.78)</td>
<td>8.28(1.72)</td>
<td>8.34(1.81)</td>
<td>0.83</td>
</tr>
<tr>
<td>Satisfaction with quality of life</td>
<td>8.48(2.06)</td>
<td>8.64(1.69)</td>
<td>8.40(2.21)</td>
<td>0.46</td>
</tr>
<tr>
<td>Realized recovery</td>
<td>7.71(2.11)</td>
<td>7.94(1.70)</td>
<td>7.60(2.27)</td>
<td>0.31</td>
</tr>
<tr>
<td>Difference between expected &amp; realized recovery</td>
<td>1.74(2.29)</td>
<td>1.75(1.96)</td>
<td>1.76(2.44)</td>
<td>0.86</td>
</tr>
</tbody>
</table>

M=mean; SD=standard deviation

The use of antidepressant drugs was low in both the intervention and control groups, therefore rather than reporting by drug categories, the variable was dichotomized into a yes/no response. There were no significant differences between groups in relation to antidepressant drug use at discharge, 6 weeks and 12 weeks (F(1, 94)=0.02, p=0.88) (Table 12).

Table 12 - Antidepressant Drug Use by Group at Discharge, 6 and 12 Weeks

<table>
<thead>
<tr>
<th>Time</th>
<th>Group</th>
<th>Antidepressant Use</th>
<th>Antidepressant Use</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes % (n)</td>
<td>No % (n)</td>
<td></td>
</tr>
<tr>
<td>Discharge</td>
<td>Intervention (61)</td>
<td>4.9% (3)</td>
<td>95.1% (58)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control (124)</td>
<td>5.6% (7)</td>
<td>94.4% (117)</td>
<td>0.99</td>
</tr>
<tr>
<td>6 weeks</td>
<td>Intervention (61)</td>
<td>1.6% (1)</td>
<td>98.4% (60)</td>
<td>0.99</td>
</tr>
<tr>
<td></td>
<td>Control (124)</td>
<td>3.2% (4)</td>
<td>96.8% (120)</td>
<td></td>
</tr>
<tr>
<td>12 weeks</td>
<td>Intervention (61)</td>
<td>1.6% (1)</td>
<td>98.4% (60)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control (124)</td>
<td>3.2% (4)</td>
<td>96.8% (120)</td>
<td>0.99</td>
</tr>
</tbody>
</table>
Postoperative Depression

Over the course of recovery from CABG surgery, participants were asked to respond to the Beck Depression Inventory (BDI-II) (to measure levels of depression) at discharge, 6 and 12 weeks post-discharge. Participants responded to statements on a 4-point scale ranging from 0 to 3.

Two sample, two-sided t-tests were conducted to evaluate the impact of peer support on BDI-II scores at discharge, 6 and 12 weeks. Total scores were analyzed between groups at each of these time points. A significant difference (p=0.05) was detected in depression scores at discharge, with the control group (M=8.87, SD=4.74) having a higher mean score than the intervention group (M =7.72, SD =3.25) (Table 12). In follow up at 6 and 12 weeks, the BDI score differences between the intervention and control groups were not statistically significant (p=0.08 and p=0.49 respectively).

Table 13 - Beck Depression Inventory Scores at Discharge, 6 and 12 Weeks

<table>
<thead>
<tr>
<th>Time</th>
<th>Group (N/185)</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
<th>t(df)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharge</td>
<td>Intervention (61)</td>
<td>7.72</td>
<td>3.25</td>
<td>2-23</td>
<td>-1.94 (164)</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Control (124)</td>
<td>8.87</td>
<td>4.74</td>
<td>0-27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 weeks</td>
<td>Intervention (61)</td>
<td>4.65</td>
<td>3.85</td>
<td>0-21</td>
<td>-1.74 (157)</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>Control (124)</td>
<td>5.84</td>
<td>5.30</td>
<td>0-30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 weeks</td>
<td>Intervention (61)</td>
<td>3.96</td>
<td>3.72</td>
<td>0-17</td>
<td>-.069 (160)</td>
<td>0.48</td>
</tr>
<tr>
<td></td>
<td>Control (124)</td>
<td>4.43</td>
<td>5.26</td>
<td>0-32</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

M=mean; SD=standard deviation

Repeated-measures ANOVA were used to analyze the BDI-II data for differences in scores between the intervention and control groups over time. It was non-significant (p=0.51) and therefore, neither group differed significantly in change in depression scores over time (F(2,553)=0.44, p=0.51).
Participants' depression scores were dichotomized based on a score of ≥ 14 (depressed) or < 14 (not depressed). Though a significant difference in depression was detected between groups at discharge (p=0.02), there were no significant differences between the intervention and control groups in follow up at 6 and 12 weeks (p=0.22, p=0.67 respectively)(Table 14).

Table 14 - Dichotomous Depression Scores at Discharge, 6 and 12 Weeks

<table>
<thead>
<tr>
<th>Time</th>
<th>Group</th>
<th>Depressed (BDI≥14) % (n/N)</th>
<th>Not Depressed (BDI&lt;14) % (n/N)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharge</td>
<td>Intervention (61)</td>
<td>1.6% (1)</td>
<td>98.4% (60)</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>Control (124)</td>
<td>11.3% (14)</td>
<td>88.7% (110)</td>
<td></td>
</tr>
<tr>
<td>6 weeks</td>
<td>Intervention (61)</td>
<td>3.3% (2)</td>
<td>96.7% (59)</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>Control (124)</td>
<td>8.9% (11)</td>
<td>91.1% (113)</td>
<td></td>
</tr>
<tr>
<td>12 weeks</td>
<td>Intervention (61)</td>
<td>1.6% (1)</td>
<td>98.4% (60)</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>Control (124)</td>
<td>4.0% (5)</td>
<td>96.0% (119)</td>
<td></td>
</tr>
</tbody>
</table>

ACNP Follow Up Calls

The ACNP (investigator) provided guidance to the peer volunteers and the patients throughout the 12 weeks of follow up. If a participant scored ≥ 14 on the BDI-II, or if a peer volunteer identified an issue, the ACNP (investigator) would telephone the patient and complete an assessment, then recommend physician or clinical psychologist follow up as necessary. A follow up telephone call was made within one day in order to ensure follow up care or resources had been sought. Over 40 telephone calls were made to participants in both the intervention (n= 7) and control groups (n=33) with depression scores ranging from 13 to 36. The majority of calls focused on providing reassurance, information and or resources/referral. The length of the telephone call ranged in time from 10 minutes to 60 minutes with a mean telephone time of 24 minutes.
Social Support

Over the course of recovery, participants were asked to respond to the shortened social support scale (SSSS) at discharge, 6 and 12 weeks post-discharge (see Appendix C for SSSS). Participants responded to statements on a rating scale that ranged from 1 ('not at all helpful') to 4 ('completely helpful'). The scoring technique chosen for this study focused on an estimate of mean support from all available perceived sources. Therefore, the higher the SSSS mean score, the higher the participant's level of perceived sources of social support. Total scores were analyzed at each time point and there were no significant differences between groups (Table 15).

Repeated-measures ANOVA were used to analyze the SSSS data for differences in scores between the intervention and control groups over time. It was non-significant (p=0.94) and therefore, neither group differed significantly in change in perceived social support scores over time (F(1,185)=0.005, p=0.94)

Table 15 - Perceived Social Support at Discharge, 6 and 12 Weeks

<table>
<thead>
<tr>
<th>Time</th>
<th>Group</th>
<th>M</th>
<th>SD</th>
<th>t(df)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharge</td>
<td>Intervention (61)</td>
<td>2.87</td>
<td>0.72</td>
<td>0.995 (182)</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td>Control (124)</td>
<td>2.77</td>
<td>0.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 weeks</td>
<td>Intervention (61)</td>
<td>2.64</td>
<td>1.05</td>
<td>-0.275 (182)</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>Control (124)</td>
<td>2.56</td>
<td>0.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 weeks</td>
<td>Intervention (61)</td>
<td>2.66</td>
<td>1.19</td>
<td>0.069(182)</td>
<td>0.86</td>
</tr>
<tr>
<td></td>
<td>Control (124)</td>
<td>2.63</td>
<td>1.17</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

M=mean; SD=standard deviation

Health Services Utilization

An additional question focused on examining the effect of a professionally-guided peer support intervention on health resource utilization. Using the PSRRQ (Appendix C), participants, were asked to respond to questions regarding any visits to health care providers...
such as family doctor, nurse practitioner (NP), cardiologist, cardiac surgeon and emergency visits. Responses were collated numerically and presented in table format.

Over the initial 6 week follow-up period, there were no significant differences between groups with respect to health service utilization. However, there were significant differences found between groups at 12 weeks with the control group using significantly more services, in particular, Family MD visits (p=0.02) and Emergency room visits (p=0.04) (Table 16).

Table 16 - Health Services Use Between Groups at 6 and 12 weeks

<table>
<thead>
<tr>
<th>Health Services</th>
<th>Group</th>
<th>6 weeks % (n/167)</th>
<th>P</th>
<th>12 weeks % (n/158)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family MD</td>
<td>Intervention</td>
<td>94.4% (51/54)</td>
<td>0.10a</td>
<td>74.0% (37/50)</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>92.9% (105/113)</td>
<td></td>
<td>87.9% (95/108)</td>
<td></td>
</tr>
<tr>
<td>NP</td>
<td>Intervention</td>
<td>3.7% (3/54)</td>
<td>0.34</td>
<td>8.8% (10/113)</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>8.8% (10/113)</td>
<td></td>
<td>2.7% (3/108)</td>
<td></td>
</tr>
<tr>
<td>Cardiologist</td>
<td>Intervention</td>
<td>53.7% (29/54)</td>
<td>0.41</td>
<td>52.0% (26/50)</td>
<td>0.84</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>46.9% (53/113)</td>
<td></td>
<td>53.7 (58/108)</td>
<td></td>
</tr>
<tr>
<td>Cardiac Surgeon</td>
<td>Intervention</td>
<td>9.2% (5/54)</td>
<td>0.78</td>
<td>30.0% (15/50)</td>
<td>0.85</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>10.6% (12/113)</td>
<td></td>
<td>28.7% (31/108)</td>
<td></td>
</tr>
<tr>
<td>Emergency</td>
<td>Intervention</td>
<td>16.6% (9/54)</td>
<td>0.19</td>
<td>4.0% (2/50)</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>25.6% (29/113)</td>
<td></td>
<td>14.8% (16/108)</td>
<td></td>
</tr>
<tr>
<td>Rehospitalization</td>
<td>Intervention</td>
<td>3.7% (2/54)</td>
<td>0.25</td>
<td>0% (0/50)</td>
<td>0.29</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>4.4% (5/113)</td>
<td></td>
<td>3.7% (4/108)</td>
<td></td>
</tr>
</tbody>
</table>

Fisher's Exact Test used.
18 Missing Cases at 6 weeks; 27 at 12 weeks

Overall, there were few participants that required re-hospitalization at both 6 (Fisher’s Exact Test, p=0.34) and 12 weeks (p=0.30). The majority of re-hospitalizations at 6 weeks occurred in the control arm and reasons for readmission were equally dispersed between cardiac and non-cardiac causes. Some of the cardiac issues included atrial fibrillation, ventricular rhythm issues, x-rays for pleural effusions, incision drainage and echocardiogram or electrocardiogram for diagnostic purposes. The mean hospital stay for the intervention arm
ranged from 1 to 5 days (M = 3 days) whereas the control arm ranged from 1 to 17 days with an average mean stay of 5.8 days. At 12 weeks, there were no readmissions documented in the intervention group however, 4 readmissions (2 cardiac and 2 non-cardiac) were documented in the control arm with a mean hospital stay of 5 days.

Participants’ Perception of Peer Support

Forty-six (75%) of the 61 participants who received the peer support intervention completed the Peer Support Evaluation Inventory (PSEI) at the end of the study (see Appendix C). This inventory was used to evaluate the participant’s perceptions regarding the different aspects of support received. The PSEI consisted of four subscales which included, supportive interactions, relationship qualities, perceived benefits and satisfaction with the support received. The overall mean score on the PSEI was negatively skewed at 121.8 (SD 6.53) with a minimum score of 114 and a maximum of 570 for the overall score range.

Each subscale of the inventory was evaluated separately as well as collectively in order to quality the peer support experience. The following is a discussion of the results.

Subscale I - Supportive Interactions

The mean score for the first subscale of supportive interactions was 61.43 (SD 8.53) with a minimum score of 39 and a maximum of 75 (score range from 15 to 75). The majority (95.5%) of participants felt the peer volunteer provided practical information that was applicable to their recovery and situation, while 4.5 % ‘disagreed’ with this statement. Over 97 % either ‘strongly agreed’ or ‘agreed’ that the peer volunteer ‘helped me feel that I was not alone in my situation’. Other areas where participants rated the supportive interactions are outlined below (Table 17).
Table 17 - Summary of PSEI Responses (Supportive Interactions)

<table>
<thead>
<tr>
<th>Perception of Supportive Interactions</th>
<th>Participants’ Responses (N=46)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
</tr>
<tr>
<td>Expressed interest and concern about how I was doing.</td>
<td>4.5 (0.55)</td>
</tr>
<tr>
<td>Listened to me talk about my feelings or concerns.</td>
<td>4.2 (0.58)</td>
</tr>
<tr>
<td>Gave trustworthy advice.</td>
<td>4.1 (0.70)</td>
</tr>
<tr>
<td>Told me what was usual for my current situation</td>
<td>4.0 (0.69)</td>
</tr>
<tr>
<td>Assisted me to solve my problems or concerns.</td>
<td>3.8 (0.94)</td>
</tr>
<tr>
<td>Suggested other ways of doing things.</td>
<td>3.7 (0.91)</td>
</tr>
</tbody>
</table>

M=mean; SD=standard deviation
15 Missing Cases

Subscale II - Relationship Qualities

The relationship qualities subscale focused on the relationship that participants developed with the peer volunteer throughout the duration of the intervention (6 weeks) (Table 18). The overall mean score for this subscale was 109.6 (SD =19.10) with a minimum score of 31 and maximum of 155. Of the 46 participants, 82.5% identified that their peer was an important ‘source of support for me’ while some participants indicated they were ‘unsure’ (8.6%) or ‘disagreed’ (8.6%). Eighty-two percent of participants indicated that they found the volunteer to be supportive and dependable (93.5%) while other participants specifically identified an aspect of the peer interactions that they had a heightened awareness of or appreciated. Examples of these included informational support (95.5%) (i.e. “he provided me with valuable information regarding the health concerns and questions that I had; he told me what was normal”), appraisal (10.8%) (i.e. “I felt better after speaking to him; I looked forward to his calls”), and emotional (13.0%) (i.e. “he was trustworthy and understood what I was going through”).

Although the majority of feedback focused on the positive attributes in the peer support relationship, 8.6% of participants felt that their peer got “over-involved in my
problems” or they felt “pressured by their volunteer to change” (4.3%). Four participants (8.6%) related that the peer “minimized” their problem, while others (6.5%) indicated peer support may be more valuable to those individuals who did not have support systems readily available or for those who lived alone.

Table 18 - Summary of PSEI Responses (Relationship Qualities)

<table>
<thead>
<tr>
<th>Perception of Relationship Qualities</th>
<th>Participants’ Responses (N=46)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td>I knew my peer would respond to me in a supportive way.</td>
<td>4.3</td>
</tr>
<tr>
<td>I felt accepted by my peer.</td>
<td>4.3</td>
</tr>
<tr>
<td>I felt comfortable being myself with my peer.</td>
<td>4.3</td>
</tr>
<tr>
<td>My peer was sensitive and understanding.</td>
<td>4.1</td>
</tr>
<tr>
<td>I looked forward to talking with my peer.</td>
<td>4.0</td>
</tr>
<tr>
<td>My peer was an important source of support for me.</td>
<td>3.9</td>
</tr>
<tr>
<td>My peer influenced how I felt or acted.</td>
<td>3.5</td>
</tr>
</tbody>
</table>

M=mean; SD=standard deviation
15 Missing Cases

Subscale III - Perceived Benefits

The perceived benefits subscale evaluated how the participant felt the volunteer helped them through their recovery. The combined mean score for this subscale was 195.3 (SD 33.73) with minimum range of 54 and maximum range of 270. The participants responded to statements such as “generally, I feel more confident in my ability to care for myself” and rated “my peer helped me feel this way” based on their perception of benefit.

Over 60 percent of the participants identified that they were “more satisfied with themselves” and had a more “positive attitude” related to the support the peer had provided. Furthermore, 45.6% (n=21) stated that the peer support was “invaluable” or “exceptional” and made them “feel better able to cope with the things I had to”. While the majority of participants (82.5%) felt it was especially helpful to talk to someone who had been through
the experience, 6.5% (N=3) identified the peer support was not an “essential element” in their recovery since they already had family support and were progressing well in their recovery.

Though the investigator diligently worked toward matching participant and peer volunteer by age, two participants were matched with peer volunteers who were older than preferable.

These participants identified that age matching was not optimal due to inherent generational differences. Table 19 summarizes various elements of perceived relationship qualities.

### Table 19 - Summary of PSEI Responses (Perceived Benefits)

<table>
<thead>
<tr>
<th>Perception of Perceived Benefits</th>
<th>Participants’ Responses (N=46)</th>
</tr>
</thead>
<tbody>
<tr>
<td>More knowledgeable about my situation</td>
<td>M=4.3 (SD=0.52)</td>
</tr>
<tr>
<td>My peer helped me feel this way</td>
<td>M=4.0 (SD=0.89)</td>
</tr>
<tr>
<td>More likely to get help if I need it</td>
<td>M=4.1 (SD=0.68)</td>
</tr>
<tr>
<td>My peer helped me feel this way</td>
<td>M=3.8 (SD=0.81)</td>
</tr>
<tr>
<td>More confident to deal with my situation</td>
<td>M=4.1 (SD=0.75)</td>
</tr>
<tr>
<td>My peer helped me feel this way</td>
<td>M=3.7 (SD=0.97)</td>
</tr>
<tr>
<td>Less isolated from others</td>
<td>M=3.5 (SD=0.98)</td>
</tr>
<tr>
<td>My peer helped me feel this way</td>
<td>M=3.3 (SD=0.99)</td>
</tr>
<tr>
<td>More similar to other cardiac surgery patients</td>
<td>M=3.6 (SD=0.76)</td>
</tr>
<tr>
<td>My peer helped me feel this way</td>
<td>M=3.5 (SD=0.89)</td>
</tr>
<tr>
<td>Life is more enjoyable</td>
<td>M=3.6 (SD=0.99)</td>
</tr>
<tr>
<td>My peer helped me feel this way</td>
<td>M=4.2 (SD=1.14)</td>
</tr>
<tr>
<td>Better able to cope with all the things I have to</td>
<td>M=3.9 (SD=0.90)</td>
</tr>
<tr>
<td>My peer helped me feel this way</td>
<td>M=3.6 (SD=1.02)</td>
</tr>
<tr>
<td>I have something in common with other cardiac patients</td>
<td>M=4.0 (SD=0.64)</td>
</tr>
<tr>
<td>My peer helped me feel this way</td>
<td>M=3.9 (SD=0.82)</td>
</tr>
<tr>
<td>More positive attitude toward myself</td>
<td>M=4.0 (SD=0.84)</td>
</tr>
<tr>
<td>My peer helped me feel this way</td>
<td>M=3.5 (SD=1.01)</td>
</tr>
<tr>
<td>Less Depressed</td>
<td>M=3.3 (SD=1.35)</td>
</tr>
<tr>
<td>My peer helped me feel this way</td>
<td>M=3.2 (SD=1.19)</td>
</tr>
<tr>
<td>More in control of my situation</td>
<td>M=3.9 (SD=0.79)</td>
</tr>
<tr>
<td>My peer helped me feel this way</td>
<td>M=3.6 (SD=1.00)</td>
</tr>
</tbody>
</table>

M=mean; SD=standard deviation
15 Missing Cases
Subscale IV - Satisfaction with Support Received

The participant’s overall satisfaction with the peer support experience was evaluated on this final subscale of the inventory. The mean score on this subscale was 59.4 (SD=7.4812) with a minimum of 14 and a maximum score of 70.

In particular, 48.8% of the male participants ‘strongly agreed’ that they were satisfied with their peer support experience, while 46.6% ‘agreed’, and 4.4% ‘disagreed’.

Eighty-six percent of participants responded that there was “nothing” they would have liked their peer to do differently while 8.6% indicated they would have liked to have met their peer volunteer in person. Although 91.2 % felt they had enough contact with their peer, 4.3 % of participants identified that they would have preferred more frequent access to their peer (beyond once weekly for a total of 6 weeks). Ninety-three percent indicated that they would recommend this type of support to a friend undergoing surgery. One patient ranked the peer volunteer as second in importance to support received from their spouse. As a whole, the majority of participants were satisfied with their peer support experience (Table 20).

Table 20 - Summary of PSEI Responses (Satisfaction with Support)

<table>
<thead>
<tr>
<th>Satisfaction with Support Received</th>
<th>Participants’ Responses (N=46)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My peer met my expectations</td>
<td>M=4.1  (SD=0.74)</td>
</tr>
<tr>
<td>My peer was respectful to me</td>
<td>M=4.5  (SD=0.50)</td>
</tr>
<tr>
<td>I was able to talk to my peer when I needed to</td>
<td>M=4.0  (SD=0.89)</td>
</tr>
<tr>
<td>I had enough contact with my peer</td>
<td>M=4.2  (SD=0.61)</td>
</tr>
<tr>
<td>I liked the support over the telephone</td>
<td>M=4.2  (SD=0.79)</td>
</tr>
<tr>
<td>There is nothing I would have liked done differently</td>
<td>M=4.2  (SD=0.76)</td>
</tr>
<tr>
<td>I would recommend this type of support to a friend</td>
<td>M=4.5  (SD=0.66)</td>
</tr>
<tr>
<td>I am satisfied with my peer support experience</td>
<td>M=4.4  (SD=0.72)</td>
</tr>
</tbody>
</table>

M=mean; SD=standard deviation
15 Missing Cases
Correlation matrices were run to assess the relationships between each of the PSEI four subscales. A significant positive correlation was found between each subtotal (Table 21). The strongest correlations were between subscale III (Perceived Benefits) and subscale IV (Satisfaction with Support Received) (correlation coefficient = 0.76, p<0.0001) and between subscale I (Supportive Interactions) and subscale IV (Satisfaction with Support Received) (correlation coefficient = 0.75, p<0.0001). The weakest correlation was between subscale I (Supportive Interactions) and Subscale II (Relationship Qualities) (correlation coefficient = 0.47, p=0.0012).

Table 21 - Pearson Correlation Coefficients of PSEI Subscales

<table>
<thead>
<tr>
<th>PSEI Subscales</th>
<th>Subscale I: Supportive Interactions</th>
<th>Subscale II: Relationship Qualities</th>
<th>Subscale III: Perceived Benefits</th>
<th>Subscale IV: Satisfaction with Support Received</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subscale I: Supportive</td>
<td>1.00</td>
<td>0.473</td>
<td>0.659</td>
<td>0.749</td>
</tr>
<tr>
<td>Interactions</td>
<td>p=0.001</td>
<td>p&lt;0.001</td>
<td>p&lt;0.001</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Subscale II: Relationship Qualities</td>
<td>0.473</td>
<td>1.00</td>
<td>0.577</td>
<td>0.580</td>
</tr>
<tr>
<td></td>
<td>p=0.001</td>
<td>p&lt;0.001</td>
<td>p&lt;0.001</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Subscale III: Perceived</td>
<td>0.659</td>
<td>0.577</td>
<td>1.00</td>
<td>0.760</td>
</tr>
<tr>
<td>Benefits</td>
<td>p&lt;0.001</td>
<td>p&lt;0.001</td>
<td>p&lt;0.001</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Subscale IV: Satisfaction with Support Received</td>
<td>0.749</td>
<td>0.580</td>
<td>0.760</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>p&lt;0.001</td>
<td>p&lt;0.001</td>
<td>p&lt;0.001</td>
<td></td>
</tr>
</tbody>
</table>
Peer Volunteer Demographic Overview

A complement of 15 peer volunteers were recruited in order to provide telephone-based peer support throughout the 12 week period of the study. The peer volunteers completed a demographic profile at the initial peer volunteer training session (Table 22). The mean age of the peer volunteer complement was 67.3 years (ranged from 49 to 81 years). The majority of volunteers had completed post-secondary education (53.4%) and were retired (86.6%). The approximate number of patients supported by each peer volunteer throughout the study period was 4, however, the maximum number of patients supported at any one time never exceeded 2. There were a select group of peer volunteers (n=3) who provided telephone support (maintained the once weekly call schedule) during their vacation/holiday time while wintering in Florida.

Table 22 - Peer Volunteers (PV) Demographics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total PV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years</td>
<td>15</td>
</tr>
<tr>
<td>- Mean age ± SD</td>
<td>67.3 (10.1)</td>
</tr>
<tr>
<td>- Range</td>
<td>49-81</td>
</tr>
<tr>
<td>Time since Surgery</td>
<td>15</td>
</tr>
<tr>
<td>- Mean time (years)</td>
<td>4.3</td>
</tr>
<tr>
<td>- Range</td>
<td>1 to 14 years post recovery</td>
</tr>
<tr>
<td>Marital Status</td>
<td>15</td>
</tr>
<tr>
<td>Married</td>
<td>100% (15/15)</td>
</tr>
<tr>
<td>Education</td>
<td>15</td>
</tr>
<tr>
<td>High School Graduate</td>
<td>46.6% (7/15)</td>
</tr>
<tr>
<td>Post-Secondary</td>
<td>53.4% (8/15)</td>
</tr>
<tr>
<td>Graduate Degree</td>
<td>0% (0/15)</td>
</tr>
<tr>
<td>Work Status</td>
<td>15</td>
</tr>
<tr>
<td>Working Full-time</td>
<td>6.7% (1/15)</td>
</tr>
<tr>
<td>Retired</td>
<td>86.6% (13/15)</td>
</tr>
<tr>
<td>Disability</td>
<td>6.7% (1/15)</td>
</tr>
<tr>
<td>Average number of patients supported per PV</td>
<td>4</td>
</tr>
</tbody>
</table>
Predicting Depression in Participants after Cardiac Surgery

Additional analyses were conducted to examine the potential relationships of a number of individual variables associated with postoperative depression. Traditionally, a score of $\geq 14$ is the cut off point for mild depression using the BDI-II (Beck et al., 1996). However, when the dichotomous BDI-II depression score was used, there were few participants identified as depressed. Thus, to maintain variability, the continuous BDI-II depression score was used and a linear rather than logistic regression model was reported.

In preparation for regression analysis, a list of individual variables relevant to the question at issue were chosen based on relevant literature and the theoretical basis of social support. These variables included, allocation group (intervention/control), age, living alone, income, education, CCS angina symptoms (at 6 and 12 weeks), previous history of depression, baseline depression score, antidepressant use, social support, as well as achieved versus expected recovery (at 12 weeks only). The results of the regression models at 6 and 12 weeks are shown below (Table 23 & 24 respectively).

Table 23 - Variables Associated with Depression at 6 weeks

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>F value</th>
<th>Beta</th>
<th>SE</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Group allocation</td>
<td>185</td>
<td>0.52</td>
<td>0.62</td>
<td>0.85</td>
<td>0.47</td>
</tr>
<tr>
<td>2. Age</td>
<td>185</td>
<td>0.32</td>
<td>-0.02</td>
<td>0.039</td>
<td>0.57</td>
</tr>
<tr>
<td>3. Living alone</td>
<td>185</td>
<td>1.34</td>
<td>1.83</td>
<td>1.59</td>
<td>0.25</td>
</tr>
<tr>
<td>4. Income</td>
<td>155</td>
<td>0.20</td>
<td>-0.39</td>
<td>0.89</td>
<td>0.65</td>
</tr>
<tr>
<td>5. Education</td>
<td>185</td>
<td>0.16</td>
<td>0.76</td>
<td>1.35</td>
<td>0.92</td>
</tr>
<tr>
<td>6. CCS Angina Symptoms</td>
<td>185</td>
<td>2.27</td>
<td>-4.54</td>
<td>4.70</td>
<td>0.10</td>
</tr>
<tr>
<td>7. History of Depression</td>
<td>185</td>
<td>0.44</td>
<td>-1.73</td>
<td>2.60</td>
<td>0.50</td>
</tr>
<tr>
<td>8. Baseline Depression score</td>
<td>185</td>
<td>1.02</td>
<td>-0.122</td>
<td>0.12</td>
<td>0.31</td>
</tr>
<tr>
<td>9. Antidepressant use</td>
<td>185</td>
<td>0.02</td>
<td>0.49</td>
<td>3.32</td>
<td>0.89</td>
</tr>
<tr>
<td>10. Social support</td>
<td>185</td>
<td>216.49</td>
<td>9.035</td>
<td>0.61</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>11. Expected/Realized recovery</td>
<td>185</td>
<td>0.20</td>
<td>-0.90</td>
<td>0.19</td>
<td>0.65</td>
</tr>
</tbody>
</table>
Table 24 - Variables Associated with Depression at 12 weeks

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>F value</th>
<th>Beta</th>
<th>SE</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Group allocation</td>
<td>185</td>
<td>0.51</td>
<td>0.68</td>
<td>0.96</td>
<td>0.48</td>
</tr>
<tr>
<td>2. Age</td>
<td>185</td>
<td>1.66</td>
<td>-0.05</td>
<td>0.04</td>
<td>0.20</td>
</tr>
<tr>
<td>3. Living alone</td>
<td>185</td>
<td>0.54</td>
<td>1.32</td>
<td>1.80</td>
<td>0.47</td>
</tr>
<tr>
<td>4. Income</td>
<td>155</td>
<td>0.37</td>
<td>-0.59</td>
<td>0.97</td>
<td>0.55</td>
</tr>
<tr>
<td>5. Education</td>
<td>185</td>
<td>0.60</td>
<td>-0.01</td>
<td>1.47</td>
<td>0.62</td>
</tr>
<tr>
<td>6. CCS Angina Symptoms</td>
<td>185</td>
<td>0.15</td>
<td>1.81</td>
<td>5.88</td>
<td>0.93</td>
</tr>
<tr>
<td>7. History of Depression</td>
<td>185</td>
<td>0.07</td>
<td>-0.77</td>
<td>2.96</td>
<td>0.80</td>
</tr>
<tr>
<td>8. Baseline Depression score</td>
<td>185</td>
<td>0.10</td>
<td>0.04</td>
<td>0.13</td>
<td>0.76</td>
</tr>
<tr>
<td>9. Antidepressant use</td>
<td>185</td>
<td>0.02</td>
<td>-0.52</td>
<td>3.64</td>
<td>0.89</td>
</tr>
<tr>
<td>10. Social support</td>
<td>185</td>
<td>163.01</td>
<td>8.78</td>
<td>0.68</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>11. Expected/Realized recovery</td>
<td>185</td>
<td>0.19</td>
<td>0.11</td>
<td>0.24</td>
<td>0.66</td>
</tr>
</tbody>
</table>

Using the significance level of the score statistic (t-test) with a chosen cut off p-value of ≤ 0.05 as the entry criterion, the only predictor that qualified for the regression model at both 6 and 12 weeks was social support. Social support was identified as a significant predictor of depression at 6 weeks (<0.0001) in that one unit increase in social support corresponded to an average increase of 9 points in the total depression score. At 12 weeks, social support was again found to be significant (p<0.0001) wherein one unit increase in social support corresponded to an average increase of 8.8 points in total depression score.
CHAPTER FIVE

DISCUSSION

Though tremendous strides have been made in the prevention and treatment of cardiovascular disease (CVD), it still remains the leading cause of morbidity and premature death in Canada (HSFC, 2003; ICES, 2002). Over eighty million (one in three) Canadians are estimated to suffer from some form of heart disease (HSFC, 2003). Considered a lifelong disease, CVD can be treated to relieve symptoms, improve quality of life and reduce early death. Coronary artery bypass graft (CABG) surgery is the most widely used surgical procedure for relief of severe symptoms (Connerney et al., 2001; Cowper et al., 2007).

Recovery from CABG surgery can be a period associated with uncertainty and emotional unrest (Blumenthal et al., 2003; Bowles, 2000; Frasure-Smith & Lesperance, 2006; Halfmann, 2000; King et al., 2001; Miller & Grindel, 2001). Given the tremendous physiological and psychological changes that patients can experience over this time, the challenge for optimal recovery is significant. Surprisingly, with the number of individuals undergoing CABG surgery, there has been relatively little consideration of the role that psychological factors play in the early recovery period (Blumenthal et al., 2003a).

Depression has been identified as an independent risk factor in patients with CVD, with estimates between 27% and 47% before heart surgery and 19% to 61% after heart surgery (Burg et al., 2003b; Pirraglia et al., 1999). Not only has the association between CVD and depression been made but the absence of social support has also been identified as a risk factor for CVD (Berkman et al., 1992; Frasure-Smith & Lesperance, 2005; Lesperance & Frasure-Smith, 2000; Pignay-Demaria et al., 2003; Sullivan et al., 2000). Depression has
been recognized as a significant and independent risk factor for cardiac events in patients recovering from CABG surgery (Blumenthal et al., 2003; Burg et al., 2003b; Connerney et al., 2001; Frasure-Smith & Lesperance, 2008; Pirraglia et al., 1999). Considering the emotional, psychological and cognitive adaptation that occurs in patients recovering from CABG surgery, it is essential that further strategies addressing the bio-psychosocial recovery needs of this population be explored.

A number of strategies have been investigated in an attempt to meet individual CABG surgery recovery needs during the transition period from hospital to home (Artinian, 1993; Barnason, 2003; Beckie, 1989; Bowles, 2000; Gallacher et al., 2003; Roebuck 1999; Tack & Gilliss, 1990). Many of these models have focused on nurse-initiated telephone follow-up or web-based informational strategies. Although nurse-initiated telephone and web-based follow-up have been identified as beneficial and helpful, the interventions have varied in approach (cost, accessibility, technological competence) thereby making conclusions difficult to generalize. Furthermore, the feasibility of nurse-initiated interventions remains questionable within the context of health care restructuring and fiscal constraint (Barnason, 2003).

Often these strategies have targeted the physical recovery of the individual patient, with the expectation that the psychological and emotional recovery would directly follow. Despite evidence that psychosocial factors are significant contributors to an individual’s sense of well-being and resulting recovery after cardiac surgery, few studies have demonstrated significant outcomes. Novel interventions are needed that embrace a holistic perspective and comprehensively address not only depression but other factors associated
with recovery are necessary. To date, interventions designed to lessen depression or increase social support in the early recovery period after CABG surgery have not been well explored.

The purpose of this study was to examine the effect of a professionally-guided telephone peer support intervention on early recovery outcomes after cardiac surgery. Depression was the primary outcome of interest, however related recovery outcomes such as social support, expectations for recovery, return to activities, realized benefits of recovery and health care resource utilization were also examined. Though the primary hypothesis that a professionally-guided peer support intervention would significantly decrease postoperative depression was not supported, other clinically important findings were revealed. These included the significant difference between groups in the use of health care services use at 12 weeks post discharge. Participants in the control group used more health services, specifically the family physician (MD) and Emergency department services at 12 weeks post discharge. Considering the potential financial implications associated with reduced health services use in the group receiving peer support, these findings provide meaningful data upon which to base further, and perhaps more focused examination. Additionally, participants in the intervention group were highly satisfied with the peer support experience, thereby reinforcing important implications for planning and delivering social support interventions.

Sample Demographics

Although depression is highly prevalent in patients hospitalized with coronary heart disease (Burg et al., 2003a, 2003b; Blumenthal et al., 2003; ENRICHD, 2003; Krannich et al., 2007; Linden et al., 2007; Tully et al., 2008b), recent studies have shown that lower socioeconomic status, less education and low perceived social support place patients at an even higher risk for development of depression after CABG surgery (Lesperance & Frasure-
Smith, 2003; Murphy et al., 2008, Wulsin & Singal, 2003). The majority of men participating in this trial were relatively young (mean age 65.3 years), married/living with significant other, well-educated and earning at least $60, 000 CAN or more per year. The demographic characteristics of the study participants are not highly representative of the CABG surgery population as a whole, and as a result, the men were at low risk for having depression (Volzke et al., 2007). Thus, the primary outcome of interest was less prevalent than initially expected.

Increasing age (65 years or older) has not only been identified as a risk factor for depression but also for increased likelihood of preoperative risk factors (i.e. low ejection fraction, angina symptoms, multiple co-morbidities) and postoperative complications (Miller & Grindel, 2001; Volzke et al., 2007). In comparison, this sample was relatively young and low operative risk considering eligibility criteria for inclusion in the study. Participants in this study underwent first time CABG surgery with no major postoperative complications and most (70%) were discharged home within 5 to 7 days after surgery. Adherence to restrictive inclusion criteria could account for the lower risk sample and possibly, lower postoperative depression scores as a result.

Postoperative Depression

Since the inception of this study, several other studies have reinforced the heightened incidence and negative outcomes associated with postoperative depression after cardiac surgery (Contrada et al., 2008; Lie et al., 2007; Goyal et al., 2005; Rafanelli et al., 2006; Tully et al., 2008a, 2008b). In follow up at one month and 6 to 8 years post CABG surgery (n=47), Rafanelli et al. (2006) identified that minor depression was a potential risk factor for future coronary events in this post surgical population. Thus, clinical recommendations
included screening and assessment for not only major but also minor depressive symptoms during the early post discharge period.

Lie et al. (2007) followed 185 postoperative CABG surgery patients at two time points of 6 weeks and 6 months post discharge. Significant improvements in anxiety and depression symptoms were found in both groups at 6 weeks and 6 months however, these improvements did not differ significantly between groups. Patients experiencing high levels of psychological distress before CABG surgery benefited from a structured informational and psychological home-based intervention program. The authors concluded that psychological screening of CABG surgery patients may serve to identify those patients at high risk of experiencing postoperative anxiety and depression.

Tully et al. (2008a, 2008b) leant further support to the association between depression and anxiety and increased morbidity risk following CABG surgery (N=440). Although preoperative depression was not associated with a higher risk of mortality, preoperative anxiety symptoms were significantly associated with increased mortality risk (after adjustment for known mortality risk factors). Reducing emotional distress before and after cardiac surgery was identified as an important factor in facilitating an uncomplicated physical recovery and improved quality of life in this surgical population. The authors highlighted the need to develop suitable screening methods and novel interventions in order to address anxiety and depression among the CABG surgery patient population.

Although in the current study, there were significant differences in depression scores at hospital discharge, there were no significant differences between groups at 6 and 12 weeks post discharge. Overall, depression scores decreased over time but neither group differed significantly in mean scores. The increased incidence of depression at discharge in the
control group could potentially be attributed to chance variation and thereby reinforces the need for replication with a larger sample. The exact prevalence of depression in cardiac patients is difficult to determine because the current literature reveals a lack of consistency in definition and measurement (i.e. instruments used, cut off scores, time of assessment). Yet the literature reveals between 32% to 65% of preoperative patients have depressive symptoms one week before surgery and 20% to 46% have postoperative symptoms lasting up to 6 months after CABG surgery (Rafanelli et al., 2006; Burg et al., 2003; Doering & Cross, 2008; McCrone et al., 2001). In this sample, the low prevalence of depression precluded the ability to find a treatment effect.

Although a formal sample size and power analysis was completed in planning this randomized controlled trial (RCT), the small sample size would be considered a major factor in the inability to detect a relationship. Clinical trials should have sufficient statistical power to detect differences between groups considered to be of clinical interest (Friedman et al., 1998). The sample was calculated assuming the rate of depression in the intervention group would be 25% while the rate in the control group would be 50%. This is a significant expected change over a relatively short period of time. Considering the study was powered to detect an absolute risk reduction of 25% and a relative risk reduction of 50%, these calculations may have lacked precision. Precision in the estimation of correct power, best sample size and optimal study duration are among the most frequently posed questions in clinical trials research (Piantadosi, 1997).
Depression and Peer Support

Peer support intervention exertion of an effect on depression levels in participants was not supported; however, it is interesting to note depression scores at discharge were higher in the control group versus the intervention group. It is not surprising that there was a temporary increase in the incidence of depression immediately after surgery considering the overlap between symptoms of depression and those of cardiac recovery. Other investigators have attributed similar findings at baseline to issues relating to the timing and measurement of depression (Rafanelli et al., 2006; McCrone et al., 2001). The dynamic nature of recovery and the illness trajectory not only poses a challenge in relation to measurement of depression but also its influence on psychosocial outcomes. Many somatic symptoms experienced by cardiac patients overlap considerably with somatic symptoms experienced by otherwise healthy individuals with depression (Doering & Cross, 2008). Therefore, normal physiological changes of recovery and somatic symptoms such as fatigue, cognitive disturbances, changes in appetite, as well as impaired sleep could potentially become identified as confounding symptoms of depression rather than symptoms of recovery or treatments. These self-reported symptoms may also account for the higher levels of depression at discharge and for the lower levels of depression as participants progressed through their recovery.

There are few RCTs in the nursing literature that have specifically focused on examining the relationship between peer support and depression in the CABG surgery population. Lie et al. (2007) investigated the effect of a nurse led intervention on depression and anxiety levels on 185 patients post-CABG surgery. Surprisingly, there were more readmissions in the intervention group (nurse-led group) than compared to the control group.
counterparts. In the absence of morbidity and mortality data, the authors indicated it was
difficult to determine whether the increased hospitalization represented an increased
economic cost or a possible health benefit. In another RCT, Sebregts et al. (2005) reported
lower depression levels in the control group (n=90) compared to the intervention (n=94) who
underwent exercise and behaviour modification. Most recently, Doering et al. (2007)
identified a nurse led cognitive-behavioural intervention (intervention n=15; control n=37)
that demonstrated increased depressive symptom reduction at 3 months although at 6 months
the difference was minimal. Other advanced practice nurse-led intervention studies focused
on education and quality of life in CABG surgery recovery have reported no treatment effects
(Shuldham et al., 2002; Weaver & Doran, 2001; Tranmer & Parry, 2004). There is an
ongoing need to further examine the mechanisms (timing, dosage, impact, sensitivity) by
which innovative care models, such as nurse-led interventions, influence health-related
outcomes in the postoperative cardiac patient population.

The neutral findings of the Enhancing Recovery in Coronary Heart Disease Patients
(ENRICHD) (2003) trial revealed that depression and negative affectivity but not low social
support were associated directly with 5 year mortality in patients (n=2481) following MI.
The authors concluded that treating low social support and or depression with cognitive
behavioral therapy did not increase event-free survival in post-MI patients. There were no
differences found between groups for the primary outcomes of mortality and recurrent
infarction. However, there was a significant decrease in depression and low perceived social
support. Although the changes in depression levels did not translate into improved survival,
there remains the need to further investigate whether treatment of depression can reduce the
risk of morbidity and mortality in patients undergoing CABG surgery. Given the large
sample size and significant power of this study, it is reasonable to assume the results of the primary outcomes are valid, in spite of several methodological issues. Subject recruitment difficulties, lack of intervention standardization and the lack of patient stratification were limitations recognized by the investigators as potential reasons for neutral results. Although presented within the context of MI patients, there are shared conceptual and methodological issues with the current study that warrant further discussion.

Measurement of Depression

Although structured interviews are considered the most rigorous and specific method of screening for depression, self-report measures have become the standard due to ease of administration and scoring (Wulsin & Singal, 2003). Several authors have used the Beck Depression Inventory (BDI) in assessing depression within the context of cardiac disease and CABG surgery (Burg et al., 2003; ENRICHD, 1993; Frasure-Smith et al., 1995; Rymaszewska, 2003; Timberlake et al., 1997). The BDI-II is a widely accepted screening instrument (consistent with current DSM-IV criteria) with established reliability and validity across several disciplines (Riskind, Beck Brown & Steer, 1987). The recent revisions to the BDI-II reflect diagnostic criteria for major depressive disorders that are described in the Diagnostics and Statistical Manual of Mental Disorders (DSM-IV) thereby improving its clinical effectiveness as well as the standardization of defining depression. Variability in the interpretation of depression scores has been identified as problematic in studies using self-report measures (Pratt et al., 1996). In order to limit variability in the interpretation of BDI-II scores in this study, a threshold cutoff score of $\geq 14$ was chosen, which was consistent with recent studies and recommendations for mild depression (Beck et al, 1996; Burg et al., 2003a, 2003b; Frasure-Smith & Lesperance, 2006).
With any self-report measure, there is the risk of underestimated or exaggerated reporting of symptoms, which may ultimately limit the classification of depression in certain patients. Participants may feel pressured or reluctant to answer questions honestly and this may also lead to misrepresentation of symptoms or findings. The possibility of clinician bias can also be present and may affect rating when completing questionnaires. Depression can often coexist with other psychosocial traits such as anxiety, hostile personality traits and chronic stress (Rozanski et al., 1999; Contrada et al., 2008). Participants with concomitant psychiatric disorders may score higher on self-report measures or measures may be skewed (Wulsin & Singal, 2003). Furthermore, it is highly likely that when approached, depressed patients or those exhibiting other psychosocial traits (i.e. anxiety, hostility, chronic stress, lower trait optimism) would decline participation in a research study.

The frequency and timing of assessments may provide possible explanation for low depression scores in this study population. Wulsin and Singal (2003) identified that the frequency of assessment and duration of follow-up may affect classification of depression since depressive symptoms and disorders can be brief, recurrent or chronic. Depression is considered a psychosocial and biological symptom that is often experienced following hospital discharge; it can peak within the first week at home and then again approximately 12 weeks after surgery (Zimmerman et al., 2004; McCrone et al., 2001; Burg et al., 2003). The current study was designed with this timing in mind; it is unlikely but possible that the assessments may have occurred either too early or too late to truly reflect depressive symptoms in participants.
Social Support

Several studies examining social support, including larger scale, longitudinal studies have demonstrated that social support predicts the incidence, severity and progression of physiological and mental illness as well as mortality (Berkman, 1979, 1985; Berkman et al., 1992; Cobb, 1982; Penninx et al., 1996). Many have focused specifically on cardiovascular disease and provide strong evidence for the favourable effects that social support (peer support) has on the course of illness and the recovery trajectory after cardiac surgery (King et al., 1993; Parent & Fortin, 2000; Whittemore et al., 2000).

In the current study, a linear regression model predicted the statistically significant relationship between the variables of depression and social support (p <0.0001, p<0.0001, respectively), in follow up at 6 and 12 weeks. In both cases, social support was identified as a significant predictor of depression wherein the positive beta estimate suggested that as social support increases so does the outcome variable of depression and vice versa. Although the nature of this relationship is not cause and effect, the somewhat counterintuitive results contribute further to the dynamic nature and complexity of social support. The regression model serves to further reinforce the link or interrelationship between social support and the psychosocial factor of depression. One possible explanation for these findings could be that depressed individuals may seek out more social support resources. Although the control group exhibited significantly higher depression scores at baseline and higher scores (although not statistically significant) throughout the 6 and 12 week follow up period, the intervention group had statistically significant higher social support scores. Considering the overall sample exhibited lower levels of depression when compared to similar study populations (Burg et al., 2003b; Connerney et al., 2001; Pirraglia et al., 1999), there may have been an
indirect effect wherein a lack of awareness of naturally occurring support resources could have lowered social support scores. Social support is a complex process that is influenced by several contextual and temporal processes (Penninx et al., 1996; Stewart, 1993), therefore further examination within the context of the cardiac recovery trajectory is warranted.

Social Support and Peer Support

Throughout the course of recovery, participants in this study were asked to respond to the statements regarding perceived sources of social support. This variable was operationalized by the Shortened Social Support Scale (SSSS) at discharge, 6 weeks and 12 weeks post-discharge. Although not statistically significant, perceived sources of social support were rated slightly higher at discharge versus follow up at 6 and 12 weeks. Furthermore, there were no significant differences found between groups in mean SSSS scores over time.

A number of observational and interventional studies have been undertaken in persons with CAD, most of which have focused on morbidity and mortality risk associated with low social support. Although the absence of social support has been identified as a major risk factor independent of cardiac disease severity in MI patients (Frasure-Smith et al., 1993; Bush et al., 2001), few studies have examined the interrelationship between social support and depression in post-CABG surgery patients.

In a prospective cohort of 183 post CABG patients, Lindsay et al. (2001) revealed that persons with lower preoperative social network scores were less likely to have symptom relief than those who had higher scores, thereby concluding that social support may influence surgical outcome. In contrast, Contrada et al. (2004) found that social support was unrelated to outcomes in a cohort of 142 post CABG surgery patients. However, social support was
associated with the primary variable of interest, stronger religious beliefs, which was associated with fewer postoperative complications and reduced hospital stays.

Peer support, a form of social support was the essential element and underlying conceptualization of the intervention in this study. This type of support incorporates information, appraisal (feedback), and emotional assistance, which was provided by individuals who possessed experiential knowledge and shared experiences (Ashbury et al., 1998; Bandura, 1986; Cohen et al., 2000). Peer support was operationalized through the provision of perceived and received support (Stewart, 1990). Participants who received the peer support intervention completed the Peer Support Evaluation Inventory (PSEI) at the end of the study. The PSEI consisted of four subscales, which included supportive interactions, relationship qualities, perceived benefits, and satisfaction with support.

The overwhelming majority (95.5%) of participants ranked their peer volunteer as an important source of social support; who provided valuable information regarding recovery norms. Although peer support did not have a significant effect on the primary outcome of depression, over 60% of participants identified they had a more 'positive outlook' and were more 'satisfied with themselves' as a result of having a peer volunteer involved in their recovery. Perceived support is important since the perception that support is available is more efficacious in effect, for mental health than the actual receipt of support (Wetherington & Kessler, 1986). This is an important finding since it may indicate that peer volunteers positively influenced the participant’s evaluations of themselves and their recovery experience. Although perceived social support scores were not significantly higher at 6 and 12 weeks, the actual received social support was evaluated extremely high on the PSEI at 12 weeks. It is possible that participants in this study chose not to identify peer support (received
support on PSEI) on the same scale as the support that family, relatives or close friends may provide (perceived support on SSSS).

The specific mechanisms of support that the peer provided were not measured precisely but the peer volunteer logs assisted the researcher to gain insight into the dynamic of the relationship. Consistent with the theoretical premise of social support (stress buffering model), peer support mechanisms may have served to: 1) enhance social networks or the perception of available support, 2) promote social comparison through dialogue with ‘similar other’, 3) promote help seeking behaviours and/or prevent health concerns, 5) increase perceptions of self efficacy of one’s ability to carry out health behaviours and cope with change (Bandura, 1986; Cohen et al., 2000; Dennis, 2003a).

Peer support has been studied across a variety of clinical conditions (Ashbury et al., 1998; Dennis et al., 2002; Dennis, 2003b; Gosha & Brucker, 1986;; Horton et al., 1997; Lawrence, 2002; Snyder, 1988) however outcomes specific to CABG surgery recovery have not been well explored (Colella & King, 2004; Parent & Fortin, 2000; Rankin & Carroll, 2004; Tranmer & Parry, 2004). A number of recent investigations examining the influence of nurse-led and/or peer support interventions on cardiac outcomes have focused primarily on MI (Appleyard et al., 2000; Rankin & Carroll, 2004) and CHF populations (O’Connor et al, 2008; Reigl & Carlson, 2004; Reigl & Carlson, 2006; Rollman & Reynolds, 2008). Of particular interest, the investigators of the Safety and Efficacy of Sertraline for Depression in Patients with Congestive Heart Failure (SADHART-CHF) (O’Connor et al., 2008) trial revealed that treating depressed CHF patients (N=469) with placebo versus selective serotonin reuptake inhibitor (SSRI) for 3 months did not make a significant difference in improving depression and clinical outcomes. However, the nurse-facilitated intervention
(telephone contact, home visit and possible psychiatric referral) had a 40% reduction in depression scores within a two-week period. As indicated by the authors, these findings provide credibility to innovative social support interventions that focus on facilitating adherence, compliance and positive health outcomes.

Parry et al. (2008) recently completed a pilot RCT examining the feasibility of a peer support intervention to support early recovery following CABG surgery and found that 93% of the peer volunteers felt adequately prepared for their role. Peers in that study made an average of 12 calls (<30 minute duration) to each patient over an 8 week recovery period. The most commonly documented supportive activities included, listening to patient concerns, promoting activities and encouraging achievements. Further, Carroll & Rankin (2008) concluded that an APN-guided peer support program for unpartnered, elderly patients (after MI or CABG surgery) improved adherence to medical recommendations, reduced hospitalizations due to cardiac-related complications but failed to reduce overall hospital readmissions. Despite tremendous difficulties in enrolling CHF patients, an underpowered study and predominantly neutral findings, Reigel and Carlson (2004) concluded that peer support improved self-care in patients with a mentor and quite likely self-care of the mentors themselves. Although the peer support intervention did not appear to be universally appealing to all CHF patients, the investigators recommended further exploration of peer type interventions before increasing acute care resources be utilized to support formalized programs. These conclusions further reinforce that peer support is a potentially beneficial delivery model that can improve care and promote health outcomes in cardiac populations, however it does require further study.
Measurement and ‘Dosage’ of Peer Support

Although a number of key prospective studies have revealed positive associations between social support (peer support) and health outcomes, studies of social support interventions have continued to render inconsistent outcomes often due to methodological issues. One of the more difficult issues when considering the influence of social (peer) support on outcomes such as cardiovascular health is to determine how social support interventions are conceptualized, offered and measured (the ‘dosage’). These outcomes are often multi-dimensional in nature and incorporate a myriad of issues that can result in difficulty interpreting the effectiveness of the research intervention. As a multidimensional concept, peer support also poses a significant measurement challenge (Cohen et al., 2000). Although, the conceptualization of perceived peer support was explicitly outlined and the mechanisms for standardizing the intervention in this study were clearly identified, inherent methodological challenges were evident in the approach.

Standardization can be achieved by developing a protocol that specifies clearly the nature and sequence of activities to be performed, details for the procedures, and training of the individuals delivering the intervention (Sidani, 1998). However, the social context of this intervention added to the complexity of controlling for confounding factors. In the setting of a peer support intervention, homogeneity within the intervention cannot always be guaranteed. The personal and professional characteristics of each peer volunteer not only affects the interpersonal, but also the technical aspects related to implementation of the intervention. Training of peer volunteers was essential, however caution was exercised in order to avoid the professionalization of these individuals. When peers become professionalized, their talents and accountability to the target population may be shifted to
the health care system, thereby diminishing the mutual identification between the peer and the subject (Eng & Smith, 1995). This possibility may hinder the ability to produce a positive outcome. In order to minimize this potential effect, the training protocol and content for peer volunteers in this study was based on previous peer support intervention studies (Ashbury et al., 1998; Brunier et al., 2002; Dennis, 2003; Horton et al., 1997).

Standardization mechanisms need to be accompanied by a strategy for representing the level of the intervention actually received by participant. Therefore, the ‘intervention dosage’ referred to the amount, frequency and duration with which the peer support intervention would be given to produce changes in outcomes. In this study, the examination of the effect of a peer support group on early recovery outcomes required several types of dosage measures such as; frequency of phone calls, duration of calls, topics of discussion, and outcomes. Although all efforts were made in order to standardize the ‘dose’ of the intervention (timing, peer training, written materials, regular follow up with peer volunteers, use of call templates, algorithms & logs), it is apparent that the ‘dose’ may have been insufficient to produce the desired outcome. Unfortunately, there are little empirical data available to definitively guide the strength (dosage) and timing of a peer support intervention (Whittemore & Grey, 2002). The resulting assumptions of timing and dosage may have hindered the ability to produce a positive outcome in this study.

Health Services Use

In follow-up at 6 and 12 weeks, participants were asked to respond to questions regarding visits to health care providers such as family physician, nurse practitioner, cardiologist, cardiac surgeon and emergency department visits. Although there were no significant differences between groups in health services use at 6 weeks, there were
significant differences at 12 weeks. Participants in the control group consistently used more health services, specifically family physician (MD) and Emergency department services at 12 weeks. Frasure-Smith and colleagues (2000) revealed that in one year follow up, MI subjects with higher depression scores (≥10 on BDI) were more likely to incur health care costs of greater than 41% higher than non-depressed subjects (in both outpatient care and hospital readmissions). Depression is often associated with low perceived social support, and as a result psychological distress and lower physical functioning (ENRICHD, 2003; Murphy et al., 2008). Although there were no significant outcomes associated with depression in this study, the findings may have important practical and financial implications. Based on the ‘hard’ outcome of reduced health services use, it is important that these results be interpreted with caution considering the limitations imposed by a small sample and effect size.

Furthermore, the inability to delineate between routine (scheduled) versus unscheduled health care visits as well as to differentiate between medically necessary visits and unnecessary medical visits does not allow detailed interpretation of the potential effect of the results. However, it is possible that professionally-guided peer support interventions focused on post-discharge recovery, as well as the promotion and maintenance of healthy behaviours have the potential to impact CABG surgery patient recovery and satisfaction, as well as lighten the financial burden on the health care system.

Social environments influence how individuals seek help from professionals and use professional services by buffering the experiences of stress (Birkel & Repucci, 1983; Stewart, 1993; Tully et al., 2008a; Murphy et al., 2008). Auslander and Litwin (1990) purported that weak social ties are the chief impetus for entry to health care services. Furthermore, Murphy et al. (2008) identified ‘living alone’ as the single most important risk
factor for early readmission or visits after CABG surgery. The question of whether the professionally-guided peer support intervention promoted early identification of potential problems and thereby reduced participant’s use of health care services remains unclear. However, the significant difference between groups would lead one to believe that the peer volunteers assisted participants through the promotion of help-seeking behaviours. Gourash (1978) defined help-seeking as any communication about a problem or difficult event directed toward obtaining support, advice or assistance in a time of distress. Indeed social networks can influence help seeking behaviours and the use of formal services by acting as screening or referral agents (Stewart, 1989). Such networks may also enhance or serve as alternatives to professional services (Eng & Young, 1992; Giblin, 1989, Stewart, 1989; Winder et al., 2004).

These results reinforce that peer support has the potential to provide a cost effective, longer-lasting form of assistance in comparison to professional support (Eng & Young, 1992) and provides beginning evidence that more enduring support may help the cardiac population progress through recovery. Studies have shown that measures of social integration are directly and positively related to mental and physical health (Thoits, 1995; Lindsay et al., 2001). The ability to identify those patients (i.e. socially isolated, single, female, less educated, multiple comorbidities) who may benefit most from a peer support intervention is indeed a timely topic requiring further study.

Limitations

This study has several important limitations. Self-report measures were used to obtain follow-up data. Self-report relies heavily on the participant’s ability to accurately respond to questions and their willingness to share personal information. Although researchers have
documented a satisfactory level of accuracy for the self-report instruments used in this study (King & Gortner, 1996; King, 2000; Rankin, 1989), the possibility of under-reporting or over-reporting of symptoms could also pose a limitation. Tully et al. (2008a, 2008b) identified that health behaviours tend to be over-estimated by self-report instruments. We underestimated the prevalence of depression in this sample of participants undergoing CABG surgery. The use of an assessment instrument for depression that is specific to the cardiac population may render results that are more sensitive and generalizable.

The dynamic nature of recovery and the inability to separate the normal changes or symptoms of physiological recovery versus the potentially confounding symptoms of depression presented a significant measurement challenge and potential study limitation. Many of the somatic symptoms experienced during recovery from CABG surgery overlap considerably with depressive symptoms (such as fatigue, concentration changes, changes in appetite and impaired sleep), and therefore limit the ability to truly separate symptoms and clearly evaluate depression during the early recovery period. Ideally, a depression screening tool for use in the post-CABG surgery population should be designed and tested specifically with careful consideration of physiological recovery outcomes.

The Shortened Social Support Scale (SSSS) was chosen for this study because of its broad focus on assessment of perceived sources of social support. This scale provided information on sources of perceived support (such as, spouse, children, friends, family, co-workers) however it did not encompass all forms of support, such as support provided by the peer volunteer. Therefore, the measurement of social support in this study was considered a limitation and the use of another tool such as the Medical Outcomes Study (MOS) Social Support Scale (Sherbourne & Stewart, 1991) may have been a better measurement choice.
The MOS was designed to be more comprehensive in terms of the various dimensions of social support (emotional and informational, tangible, affectionate, and positive social interaction) and provides an index of sources of available social support (versus a breakdown by source).

Furthermore, the low rate (less than 10%) of depression in this study population (relative to previous studies) could be considered a limitation. When the outcome of interest occurs in such low incidence, this greatly reduces the ability to observe a significant intervention effect.

Generalizability of the findings were limited due to the homogeneous sample and the small geographic area used for recruitment. Participants in this study were recruited from three Ontario hospitals and were undergoing first time CABG and, relatively uncomplicated surgery. This select sample was predominantly white, middle class, well-educated and self-selected. Thus, the effect of peer support on recovery outcomes among women, low-income or immigrant populations is unknown, as is the effect in rural areas or communities with limited professional health services (underserviced areas).

Strengths

This was a randomized controlled trial design, which is considered the gold standard in effectiveness research (Friedman et al., 1998; Fogg & Gross, 2000). Efforts were undertaken to ensure the methodological rigor of this study. Statistical conclusion validity was achieved through the statistical power of 80% to prevent a Type II error and a power analysis, which was conducted to determine the sample size.

To promote consistency in data collection, inter-rater reliability checks were conducted between the investigator and research assistants on a regular basis and satisfactory
reliability was maintained (>92%). Furthermore, data were collected at a central site in a consistent and systematic fashion: 1) research assistants were trained in data collection and telephone follow-up, 2) algorithms were developed to ensure consistency and safety in follow up (for both research assistants and peer volunteers) (ie. participants requiring acute care nurse practitioner (ACNP)(investigator) follow-up) and, 3) a clearly delineated follow-up time schedule ensured calls were made within the appropriate time intervals. To ensure consistency in the recruitment process, one individual recruited the predominant portion of participants from the three study sites. A trained research nurse provided occasional coverage for recruitment at the Toronto site when necessary.

In order to decrease selection bias and to control for confounding variables, all participants were randomized using consecutively numbered, sealed opaque envelopes constructed by an individual not involved in the recruitment process. Randomization occurred after consent and baseline data were obtained with the participant present. An audit trail was available and no violations occurred in the randomization process.

Training and regular follow-up with the peer volunteers was completed by the ACNP (investigator) in an attempt to ensure consistency in the delivery of the intervention. Psychosocial interventions are difficult to define and measure precisely due to the variance that can occur within the supportive relationship. Inconsistent implementation of an intervention presents a threat to the validity of the conclusions of an intervention, which in turn, affects the ability to demonstrate positive study outcomes (Sidani, 1998). Considering the difficulties inherent in determining the ‘dose’ of the intervention, clear delineation and follow-up of the protocol was necessary.
Implications for Practice

Peer Support

This trial was one of the larger nursing trials to evaluate the effect of professionally guided peer support in men recovering from cardiac surgery and considering the negative results, needs to be interpreted with caution. Peer support had a significant effect on the participant's health services utilization at 12 weeks post-discharge but effects on the primary and secondary outcomes were not shown.

The participant's evaluation of the peer support experience was overwhelmingly positive, however a number of pragmatic issues need to be considered in order to advocate for peer support programs. The planning and implementation of peer support interventions are time intensive and include: 1) the formal functioning of the peer support program (i.e. funds for telephone support, print support, operating costs; although nominal but required) in order to ensure sustainability, 2) the responsibility for recruitment, training and providing medical guidance as well as support to peer volunteers, 3) the mechanism of who will inform patients and families about the program and coordinate the identification and matching of a peer volunteer, and 4) the valuing of a peer support program from professional staff. Thus, future endeavours need to focus on developing partnerships with hospital and community professionals/organizations in order to ensure program continuity and sustainability.

The peer volunteer orientation/training session should be standardized and it is essential that the referral process to appropriate health care professionals be clearly outlined and discussed in order to avoid potentially negative outcomes. In this study, peer volunteer algorithms proved to be very useful in guiding referrals to the ACNP (investigator) when
issues were considered beyond their scope. It is essential that there are sources of support available to the peer volunteers themselves; key contact people to act as confidants. The ACNP (investigator) acted as the primary coordinator and follow up contact in this study; considering the time consuming nature of the coordinator role, efforts to consolidate this role should be explored.

Depression among patients recovering from CABG surgery is a significant health problem with demonstrated adverse effects on both psychosocial and physiological recovery outcomes (ENRICHD, 2003; Murphy et al, 2008; Wulsin & Singal, 2003). Approximately half of cardiovascular physicians report that they treat depression in their patients and not all patients who are recognized as depressed are treated (Feinstein et al., 2006). Though some clinicians may consider depression a ‘normal’ response to a stressful life event that will subside once the stressor stabilizes, this may not always be the case. Thus, early assessment, routine screening and treatment of depression may lead to improved outcomes in the cardiovascular population (Lesperance & Frasure-Smith, 2000; Blumenthal et al., 2003; Burg et al., 2003; Oxlad et al., 2006; Rafanelli et al., 2006). Lichtman and colleagues (2008) recommended a strategy of increased awareness and screening for patients with coronary artery disease. These recommendations included: routine screening for all patients in various settings (hospital, doctors office, clinic and cardiac rehabilitation centers); patients with positive results should be evaluated by a qualified professional in diagnosis and management of depression; careful monitoring of patients who are under treatment for adherence and safety and; coordination of care between healthcare providers in patients with combined medical and mental health diagnosis. Corson and colleagues (2004) recently suggested that asking two simple questions about the presence and duration of mood and anhedonia may be
just as effective as using longer instruments. Nonetheless, it is important that healthcare providers and advanced practice nurses focus attention on screening for depression and referral for further evaluation and treatment when necessary.

Although there is no direct evidence that routine measurement of depression leads to improved patient outcomes (Gilbody et al., 2001), depression has been linked with poor outcomes (morbidity, mortality, reduced adherence, lower rates of cardiac rehab and reduced quality of life). Given quality care outcomes and the costly potential for depression in CABG surgery patients, it is important to implement a consistent strategy using screening tools that are both sensitive and specific.

Furthermore, health care providers must be aware of the high prevalence of depression and the potential consequences of low social support in combination with depressive symptoms in CABG surgery patients. There is considerable evidence that social support decreases morbidity and facilitates recovery from illness as well as expedites recovery from MI and CABG surgery (Contrada et al., 2004; Frasure-Smith et al., 2003; Lindsay et al., 2001). This coping resource has been shown to enhance physical and psychological well-being both directly and as a buffer to stress (Cohen & Wills, 1985; Cohen & Syme, 1985; Gottlieb, 1983; Thoits et al., 2000). As advanced practice nurses, it is essential that frontline clinicians are educated to screen patients before discharge from hospital in order to identify patients who may be at a heightened risk for poor outcomes after CABG surgery (i.e. older, socially isolated, single or widowed, less educated, female, multiple co-morbidities). Although questions remain regarding social support and its association with heart health outcomes, all health care professionals must play a central role in the assessment of social support adequacy and identification of community resources.
Implications for Advanced Practice

Evidence-based practice

The ACNP role is designed as a collaborative model that incorporates patients, families, nurses, physicians and other allied health care providers. The expanded scope of advanced practice integrates elements of direct clinical practice in combination with consultation, administration, education and research (Hamric et al., 2005). Evidence-based practice refers to the integration of best research evidence with clinical expertise and patient values to facilitate clinical decision-making (DiCenso et al., 2005). Advanced practice nurses use their knowledge of a patient and knowledge from previous experiences with similar patients to identify research questions focused on addressing quality care outcomes. Research is the primary mechanism in which advanced practice nurses develop and test nursing interventions (Whittemore & Grey, 2002). The goal of nursing intervention research is to develop effective interventions that are timely, responsive to patient care needs and capable of producing positive outcomes. The identification of a peer support intervention that could potentially improve recovery outcomes in patients after CABG surgery was developed in response to an identified patient need. Although the primary outcome (depression) of interest was negative, it is important to recognize the important implications original research contributes to the body of advanced practice nursing knowledge. Negative trials provide important information relevant to future study regarding sampling, intervention refinement, appropriate assessment tools and methodological approach (Friedman et al., 1998). It is the responsibility of the investigator (advanced practice nurse) to critically examine research and approaches in order to implement practice changes based on the best evidence.
Best research evidence “refers to methodologically sound, clinically relevant research about the effectiveness and safety of interventions” (DiCenso et al., 2005, p.4).

Several elements that should be carefully considered for future study design include social support measurement and appropriate choice of tools (possible use of MOS survey in future), sampling considerations (focus on recruitment and retention of female peer volunteers and participants, possible focus on high risk patients), timing and nature (dosage) of the intervention and accurate measurement of health services use (delineating scheduled versus unscheduled health care visits). Considering the primary outcome of interest (depression) was not significant, it is possible that an alternative outcome of interest such as self-efficacy may be more relevant to this population. The application of resources (specifically, peer support training and evaluation) will provide a basis upon which development of a peer support program and future research at Toronto Cardiac Rehab will be based.

Knowledge Transfer

An essential step in evidence-based research is the dissemination of research findings regardless of positive, neutral or negative results (Piantadosi, 1997). Knowledge transfer refers to the processes used to communicate knowledge from research studies to target audiences (care providers, administrators, decision/policy makers) in order to promote knowledge uptake (Hamric et al., 2005). Considering change remains a constant in the healthcare environment, it is essential that the advanced practice nurse play a key role in disseminating advances in care to the frontline interdisciplinary staff, as well as administration. The findings in this study are particularly relevant to staff providing care to patients recovering from CABG surgery, therefore results will be presented at surgical
rounds (at each participating site), international conference proceedings and submitted for publication.

**Leadership**

As leaders in the profession, the advanced practice nurse is an essential part of the interdisciplinary team that focuses on identifying practice changes in order to ensure well-designed and quality care processes (Hamric et al., 2005). Cost-effective programs that enhance patient outcomes and satisfaction are goals of health care stakeholders at all levels. The lower utilization of health services at 12 weeks in the intervention arm provided promising results that warrant further examination. Although beyond the scope of the current study, a cost-effectiveness analysis may provide a better understanding of the net cost benefit of such an intervention on the health care system. The advanced practice nurse could lead cost-effectiveness studies that may result in a change in practice. Leadership in advanced practice entails the careful assessment of outcomes and lobbying for cost-effective interventions that improve quality patient care.

**Implications for Future Research**

There are several research implications from this trial. Although this study did not produce statistically significant clinical results from a peer support intervention in post cardiac surgery patients, it certainly does not prove that such a benefit does not exist. Considering empirical investigations of peer support interventions are relatively new, it is important that future research focus on the significant measurement challenges that exist in implementing socially complex interventions.

As a multidimensional concept, peer support requires further clarification.
Specific elements of the relationship need to be further examined in order to facilitate better understanding of the interrelationships that develop between the peer support recipient and provider as well as professional guiding the intervention. Furthermore, the amount of training required to truly maintain the 'peer' quality (versus professionalization) of a peer volunteer is questionable and necessitates further study. The timing, duration and nature of the peer support intervention are all issues in need of further study. In specific, the standardization of a peer support intervention remains questionable and an area in need of further clarification. Additionally, the amount of peer support that is necessary (dosage) and the threshold upon which further support will not be beneficial are both areas in need of further empirical study. Currently, there is little empirical data available to guide the development of social support interventions and as such, previous studies are often used as a guide or provide a template upon which the researcher can build.

A number of previous studies have highlighted depression-related risks for mortality and morbidity in participants recovering from MI and CABG surgery (Burg et al., 2003a, 2003b; Blumenthal et al., 2003; Joynt & O'Connor, 2005; Tully et al, 2008a), however, it is unclear at what point depression truly becomes a risk factor for cardiovascular disease. Blumenthal et al. (2003b) identified that not only patients with moderate-to-severe depression before CABG surgery but also patients with mild or moderate-to-severe depression that persisted for 6 months post surgery had higher death rates than those without depression. It is conceivable that minor depression may be largely unrecognized and untreated more frequently than major depression, thereby representing a persistent risk factor increasing psychological and physiological vulnerability (Rafanelli et al., 2006). Although screening tools generally have good sensitivity (80 to 90%) but only fair specificity (70 to
85%), the lack of consistency in assessment tools as well as cut off points are elements in need of further investigation (Doering & Cross, 2008).

Ideally, screening tools for depression should be designed and tested specifically for use in the cardiac population (Davidson et al., 2008; Hare & Davis, 1996). Birks et al. (2004) revealed that the Cardiac Depression Scale (CDS) (Hare & Davis, 1996) had greater sensitivity to extremes of depression scores (in comparison to the BDI) in a sample of Australian medical cardiac patients (n=396). Recently, a North American study reported on the utility and validity of the CDS in a post CABG surgery population (n=120) and found the CDS to be more sensitive to changes in depression over time when compared to the BDI (King et al., 2008). Considering these promising results and the prevalence of depression in relation to adverse outcomes in the prognosis of cardiac patients, the CDS screening tool merits further attention and examination.

The prevalence of depression has also been shown to be higher among women, not only in the general population but also among the cardiac population (Kessler, 2003; Pilote et al., 2007). Horsten and colleagues (2000) identified that women (n=292) with two or more depressive symptoms after an acute coronary syndrome (ACS) had significantly lower levels of social network contacts and social integration. Not only does depression reduce the likelihood of social processes; it has been associated with decreased adherence to medications, noncompliance with medical regimens, increased health care utilization, as well as a reduction in successful modification of cardiac risk factors (Cowper et al., 2007; Frasure-Smith et al., 2000; Rafanelli et al., 2006; Tully et al, 2008a, 2008b). Therefore, further study focusing on gender differences as well as cultural differences within the context of depression, social support and recovery outcomes is indeed warranted. Replication of this
RCT with a larger, higher risk sample (both female and male participants with multiple comorbidities) over a longer follow up period with a focus on peer support and potential mechanisms by which depression affects medical/health outcomes is warranted. These efforts will expand the understanding of the impact that depression has on key prognostic factors and guide further development, as well as refinement of patient focused interventions for individuals at risk for poor outcomes after CABG surgery.

Conclusions

Given the profound impact that cardiovascular disease has on the health status of North Americans, and the number of individuals undergoing CABG surgery, the need to provide an effective recovery strategy for these patients continues to be key. Though the primary hypothesis that a professionally-guided peer support intervention would significantly decrease postoperative depression was not supported, other clinically important findings were elucidated. Several investigators continue to reinforce that postoperative depression needs to be recognized as an independent risk factor for morbidity and mortality in the post CABG surgery patient population. Since some forms of psychosocial stress (i.e. depression) are subject to clinical modification, their contribution to the underlying development of disease may be reduced by interventions designed to treat such factors. The potentially protective effect of peer support interventions designed to optimize the individual’s social environment and the individual’s interactions within it merits further attention.

Effective follow up and management of both the physiological and psychosocial needs of the post CABG surgery population is a critical aspect of the overall recovery process. The key to further understanding the link between psychosocial and conventional risk factors and their impact on recovery outcomes is continued investigation. The findings of
the current study serve to highlight the need for further development and examination of suitable interventions for individuals at risk for low social support and depression after CABG surgery.
References


Heart and Stroke Foundation of Canada (2003). The growing burden of heart disease and stroke in Canada. Author: Ottawa, Canada.


Appendix A

Included in this appendix are Letters of Ethics Approval from:

(i) The University of Calgary
(ii) Sudbury Regional Hospital
(iii) Sunnybrook & Women's Health Sciences Centre
(iv) Southlake Regional Health Centre
Appendix B

Included in this appendix are letters of support from:

(i) Mended Hearts, Inc. (Sudbury Chapter)
(ii) Toronto Rehab Institute – Cardiac Rehab & Secondary Prevention
Appendix C

Included in this appendix are:

i) The Expectations Inventory Questionnaire,
ii) The Beck Depression Inventory II,
iii) The Shortened Social Support Scale,
iv) The Postoperative Self Report of Recovery Questionnaire,
v) The Peer Support Evaluation Inventory,
vii) The Health Record Audit
Expectations Inventory Questionnaire*

Gender_____ (1-female, 2-male)    Age_____  

Section A - Expectations for Recovery

1. What prompted you to have cardiac surgery now?  
   ________________________________________________________________
   ________________________________________________________________

2. Are any of the following among your expectations for recovery?
   Prolonged life?    □ Yes    □ No
   Freedom from pain and fatigue    □ Yes    □ No
   Improved quality of life    □ Yes    □ No
   Return to former activities    □ Yes    □ No
   Travel and recreation    □ Yes    □ No

DISCOMFORTS  
On a scale of 0 to 10 (with ‘0’ meaning none and ‘10’ being the worst), please tell me how would you rate your level of discomfort at this time.

   Chest incision  0 1 2 3 4 5 6 7 8 9 10
   Leg incision  0 1 2 3 4 5 6 7 8 9 10 Not applicable □
   Arm incision  0 1 2 3 4 5 6 7 8 9 10 Not applicable □
   Back  0 1 2 3 4 5 6 7 8 9 10
   Neck  0 1 2 3 4 5 6 7 8 9 10
   Other discomforts: ______________________ 0 1 2 3 4 5 6 7 8 9 10  
   (please identify) ______________________ 0 1 2 3 4 5 6 7 8 9 10
HEALTH STATE

3. On a scale of zero to ten, to what degree do you plan to recover your health?

0 1 2 3 4 5 6 7 8 9 10

QUALITY OF LIFE

4. On the same scale, how would you rate your quality of life as of this date?

0 1 2 3 4 5 6 7 8 9 10

5. **CCS Angina Classification** (Circle one)
   This question is about symptoms of your heart problem. Please circle the one that reflects your current state.

- Class I: Ordinary physical activity does not cause angina, no symptoms.
- Class II: Comfortable at rest, slight limitation of ordinary activity
- Class III: Comfortable at rest but marked limitations of ordinary physical activity.
- Class IV: Inability to carry on any physical activity without discomfort

Section C – Demographics

6. What are your current living arrangements? Are you living with ___ (1-spouse) ___ (2- sibling) ___ (3- son) ___ (4- daughter) ___ (5- friend) ___ (6- partner) ___ (7-alone)

7. Where will you be staying after you leave the hospital?
   1- at home alone
   2- at home with spouse or family member
   3- with family member
   4- other ____________________

8. Who will be the primary person helping you once you are there? ___ (1-spouse) ___ (2-sibling) ___ (3-son) ___ (4-daughter) ___ (5-friend) ___ (6-partner) ___ (7-other)
9. Were you employed prior to surgery? □ Yes □ No
   Please check one of the following if applicable.
   □ Professional
   □ Administrative
   □ Small business
   □ Clerical
   □ Skilled
   □ Unskilled
   □ Farming
   □ Homemaker
   □ Other ________________

10. Following surgery, will you return to employment? □ Yes □ No

11. What is the highest level of education that you have completed? (please check)

   □ 6th grade
   □ 9th grade
   □ 11th grade
   □ High school graduate
   □ Partial post-secondary education
   □ Post-secondary graduate
   □ Graduate school degree

12. What is your annual household income before taxes?
   1. $0-$19,999
   2. $20,000-$39,999
   3. $40,000-$59,999
   4. $60,000-$79,999
   5. $80,000 or more

   Thank you for your time.

* This questionnaire was modified for use by Colella, with permission from Dr. Kathryn King, RN, PhD, University of Calgary, from its originally published version (Gortner, Jaeger, Harr & Hlatky, 1994).
Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the one statement in each group that best describes the way you have been feeling during the past two weeks, including today. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness
   0 I do not feel sad.
   1 I feel sad much of the time.
   2 I am sad all the time.
   3 I am so sad or unhappy that I can’t stand it.

2. Pessimism
   0 I am not discouraged about my future.
   1 I feel more discouraged about my future than I used to be.
   2 I do not expect things to work out for me.
   3 I feel my future is hopeless and will only get worse.

3. Past Failure
   0 I do not feel like a failure.
   1 I have failed more than I should have.
   2 As I look back, I see a lot of failures.
   3 I feel I am a total failure as a person.

4. Loss of Pleasure
   0 I get as much pleasure as I ever did from the things I enjoy.
   1 I don’t enjoy things as much as I used to.
   2 I get very little pleasure from the things I used to enjoy.
   3 I can’t get any pleasure from the things I used to enjoy.

5. Guilty Feelings
   0 I don’t feel particularly guilty.
   1 I feel guilty over many things I have done or should have done.
   2 I feel quite guilty most of the time.
   3 I feel guilty all of the time.

6. Punishment Feelings
   0 I don’t feel I am being punished.
   1 I feel I may be punished.
   2 I expect to be punished.
   3 I feel I am being punished.

7. Self-Dislike
   0 I feel the same about myself as ever.
   1 I have lost confidence in myself.
   2 I am disappointed in myself.
   3 I dislike myself.

8. Self-Criticalness
   0 I don’t criticize or blame myself more than usual.
   1 I am more critical of myself than I used to be.
   2 I criticize myself for all of my faults.
   3 I blame myself for everything that happens.

9. Suicidal Thoughts or Wishes
   0 I don’t have any thoughts of killing myself.
   1 I have thoughts of killing myself, but I would not carry them out.
   2 I would like to kill myself.
   3 I would kill myself if I had the chance.

10. Crying
    0 I don’t cry anymore than I used to.
    1 I cry more than I used to.
    2 I cry over every little thing.
    3 I feel like crying, but I can’t.
<table>
<thead>
<tr>
<th>11. Agitation</th>
<th>17. Irritability</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 I am no more restless or</td>
<td>0 I am no more irritable</td>
</tr>
<tr>
<td>wound up than usual.</td>
<td>than usual.</td>
</tr>
<tr>
<td>1 I feel more restless or</td>
<td>1 I am more irritable</td>
</tr>
<tr>
<td>wound up than usual.</td>
<td>than usual.</td>
</tr>
<tr>
<td>2 I am so restless or</td>
<td>2 I am much more</td>
</tr>
<tr>
<td>agitated that it's hard to</td>
<td>irritable than usual.</td>
</tr>
<tr>
<td>stay still.</td>
<td>3 I am irritable all the</td>
</tr>
<tr>
<td>3 I am so restless or</td>
<td>time.</td>
</tr>
<tr>
<td>agitated that I have to</td>
<td></td>
</tr>
<tr>
<td>keep moving or doing</td>
<td></td>
</tr>
<tr>
<td>something.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12. Loss of Interest</th>
<th>18. Changes in Appetite</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 I have not lost interest</td>
<td>0 I have not experienced</td>
</tr>
<tr>
<td>in other people or</td>
<td>any change in my</td>
</tr>
<tr>
<td>activities.</td>
<td>appetite.</td>
</tr>
<tr>
<td>1 I am less interested in</td>
<td>1a My appetite is</td>
</tr>
<tr>
<td>other people or things</td>
<td>somewhat less than</td>
</tr>
<tr>
<td>than before.</td>
<td>usual.</td>
</tr>
<tr>
<td>2 I have lost most of my</td>
<td>1b My appetite is</td>
</tr>
<tr>
<td>interest in other people</td>
<td>somewhat greater than</td>
</tr>
<tr>
<td>or things.</td>
<td>usual.</td>
</tr>
<tr>
<td>3 It's hard to get</td>
<td>2a My appetite is</td>
</tr>
<tr>
<td>interested in anything.</td>
<td>much less than before.</td>
</tr>
<tr>
<td></td>
<td>2b My appetite is much</td>
</tr>
<tr>
<td></td>
<td>greater than usual.</td>
</tr>
<tr>
<td></td>
<td>3a I have no appetite at</td>
</tr>
<tr>
<td></td>
<td>all.</td>
</tr>
<tr>
<td></td>
<td>3b I crave food all the</td>
</tr>
<tr>
<td></td>
<td>time.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>13. Indecisiveness</th>
<th>19. Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 I make decisions about</td>
<td>Difficulty</td>
</tr>
<tr>
<td>as well as ever.</td>
<td>0 I can concentrate as</td>
</tr>
<tr>
<td>1 I find it more difficult</td>
<td>well as ever.</td>
</tr>
<tr>
<td>to make decisions than</td>
<td>1 I can't concentrate as</td>
</tr>
<tr>
<td>usual.</td>
<td>well as usual.</td>
</tr>
<tr>
<td>2 I have much greater</td>
<td>2 It's hard to keep my</td>
</tr>
<tr>
<td>difficulty in making</td>
<td>mind on anything for</td>
</tr>
<tr>
<td>decisions than I used to.</td>
<td>very long.</td>
</tr>
<tr>
<td>3 I have trouble making</td>
<td>3 I find I can't</td>
</tr>
<tr>
<td>any decisions.</td>
<td>concentrate on anything.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>14. Worthlessness</th>
<th>20. Tiredness or Fatigue</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 I do not feel I am</td>
<td>0 I am no more tired or</td>
</tr>
<tr>
<td>worthless.</td>
<td>fatigued than usual.</td>
</tr>
<tr>
<td>1 I don't consider myself</td>
<td>1 I get more tired or</td>
</tr>
<tr>
<td>as worthwhile and useful</td>
<td>fatigued more easily than</td>
</tr>
<tr>
<td>as I used to.</td>
<td>usual.</td>
</tr>
<tr>
<td>2 I feel more worthless</td>
<td>2 I am too tired or</td>
</tr>
<tr>
<td>as compared to other</td>
<td>fatigued to do a lot of</td>
</tr>
<tr>
<td>people.</td>
<td>the things I used to do.</td>
</tr>
<tr>
<td>3 I feel utterly</td>
<td>3 I am too tired or</td>
</tr>
<tr>
<td>worthless.</td>
<td>fatigued to do most of</td>
</tr>
<tr>
<td></td>
<td>the things I used to do.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>15. Loss of Energy</th>
<th>21. Loss of Interest in</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 I have as much energy as</td>
<td>Sex</td>
</tr>
<tr>
<td>ever.</td>
<td>0 I have not noticed any</td>
</tr>
<tr>
<td>1 I have less energy than</td>
<td>recent change in my</td>
</tr>
<tr>
<td>I used to have.</td>
<td>interest in sex.</td>
</tr>
<tr>
<td>2 I don't have enough</td>
<td>1 I am less interested in</td>
</tr>
<tr>
<td>energy to do very much.</td>
<td>sex than I used to be.</td>
</tr>
<tr>
<td>3 I don't have enough</td>
<td>2 I am much less</td>
</tr>
<tr>
<td>energy to do anything.</td>
<td>interested in sex now.</td>
</tr>
<tr>
<td></td>
<td>3 I have lost interest in</td>
</tr>
<tr>
<td></td>
<td>sex completely.</td>
</tr>
</tbody>
</table>

<p>| 16. Changes in Sleeping   |                           |</p>
<table>
<thead>
<tr>
<th>Pattern</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 I have not experienced</td>
<td></td>
</tr>
<tr>
<td>any change in my</td>
<td></td>
</tr>
<tr>
<td>sleeping pattern.</td>
<td></td>
</tr>
<tr>
<td>1a I sleep somewhat</td>
<td></td>
</tr>
<tr>
<td>more than usual.</td>
<td></td>
</tr>
<tr>
<td>1b I sleep somewhat</td>
<td></td>
</tr>
<tr>
<td>less than usual.</td>
<td></td>
</tr>
<tr>
<td>2a I sleep a lot more</td>
<td></td>
</tr>
<tr>
<td>than usual.</td>
<td></td>
</tr>
<tr>
<td>2b I sleep a lot less</td>
<td></td>
</tr>
<tr>
<td>than usual.</td>
<td></td>
</tr>
<tr>
<td>3a I sleep most of the</td>
<td></td>
</tr>
<tr>
<td>day.</td>
<td></td>
</tr>
<tr>
<td>3b I wake up 1–2 hours</td>
<td></td>
</tr>
<tr>
<td>early and can't get back</td>
<td></td>
</tr>
<tr>
<td>to sleep.</td>
<td></td>
</tr>
</tbody>
</table>

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Total Score
Shortened Social Support Scale**

1. When people experience surgery, such as cardiac surgery, the people around them can sometimes help and sometimes make things harder, even if they don’t realize it. Please circle the answers below which best indicate how helpful these people are.

<table>
<thead>
<tr>
<th></th>
<th>Not at Helpful</th>
<th>A little helpful</th>
<th>Usually helpful</th>
<th>Completely helpful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spouse</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Children</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Other Relatives</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Friends</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Coworkers</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

** This scale was modified for use in this study with the permission of Dr. J. Marshall, PhD from its originally published version. (Funch, Marshall & Gebhardt, 1986).
Postoperative Self Report of Recovery Questionnaire*

Sex: _____ Age:____

ACTIVITIES/SOCIAL ROLES

1. Have you returned to your normal activity?  □ Yes  □ No

2. If you were employed before surgery, have you returned to employment?  □ Yes  □ No

3. What has permitted you/prevented your from returning to employment?

________________________________________

4. Have you returned to your other activities?  □ Yes  □ No

5. What has permitted you/prevented you from returning to these other activities?

________________________________________

DISCOMFORTS OR SYMPTOMS

On a scale of 0 to 10 (with ‘0’ meaning none and ‘10’ being the worst), please tell me how would you rate your level of discomfort at this time?

Chest incision 0 1 2 3 4 5 6 7 8 9 10

Leg incision 0 1 2 3 4 5 6 7 8 9 10 □ Not applicable

Arm incision 0 1 2 3 4 5 6 7 8 9 10 □ Not applicable

Back 0 1 2 3 4 5 6 7 8 9 10

Neck 0 1 2 3 4 5 6 7 8 9 10

Other discomforts: _________________________ 0 1 2 3 4 5 6 7 8 9 10

(please identify)

________________________________________ 0 1 2 3 4 5 6 7 8 9 10
HEALTH CARE UTILIZATION VISITS

6. Have you been for a regularly scheduled check-up? ☐ Yes ☐ No

7. Have you visited any of the following health care providers? Check all that apply.

☐ Family Doctor
  # of times _____ Problem(s): ________________________________
  ________________________________

☐ Family Nurse Practitioner
  # of times _____ Problem(s): ________________________________
  ________________________________

☐ Cardiac Surgeon
  # of times _____ Problem(s): ________________________________
  ________________________________

☐ Cardiologist/Internist
  # of times _____ Problem(s): ________________________________
  ________________________________

☐ Emergency Department
  # of times _____ Problem(s): ________________________________
  ________________________________
Have you been readmitted to hospital?  □ Yes  □ No

If yes:

<table>
<thead>
<tr>
<th>Admission date D/M/YR</th>
<th>Reason for readmission (check all that apply)</th>
<th>Discharge Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cardiac □ Non cardiac □</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medical □ Surgical □</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cardiac □ Non cardiac □</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medical □ Surgical □</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cardiac □ Non cardiac □</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medical □ Surgical □</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cardiac □ Non cardiac □</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medical □ Surgical □</td>
<td></td>
</tr>
</tbody>
</table>

Have you used: (check one)
- Home health aides (1) ___
- Home care nurses (2) ___
- None (0) ___

8. **CCS Angina Classification** (Circle one)

This question is about symptoms of your heart problem. Please circle the one that reflects your current state.

- **Class I**: Ordinary physical activity does not cause angina, no symptoms.
- **Class II**: Comfortable at rest, slight limitation of ordinary activity
- **Class III**: Comfortable at rest but marked limitations of ordinary physical activity.
- **Class IV**: Inability to carry on any physical activity without discomfort

**MEDICATIONS** - Mood-Altering Drugs/Medications
(circle if applicable)

**Classification**

**SSRI Antidepressants**
- Celexa (Citalopram)
- Zoloft (Sertraline)
- Paxil (Paroxetine)
- Prozac (Fluoxetine)
- Luvox (Fluvoxamine)

**MAOI**
- Nardil (Phenelzine)
- Parnate (Tranylcypromine)
- Marplan (Isocarboxazid)

**TCA’s**
- Aventyl (Nortriptyline)
Elavil (Amitriptyline)
Norpramin (Desipramine)
Tofranil (Imipramine)
Remeron (Mirtazapine)

Other
- Effexor (Venlafaxine)
- Wellbutrin (Bupropion)
- Serzone (Nefazodone)
- Desyrel (Trazodone)

Other: ____________________________ (please identify)

HEALTH STATE

9. To what degree do you believe you have recovered your health as of this date?

0 1 2 3 4 5 6 7 8 9 10

QUALITY OF LIFE

10. How would you rate your quality of life as of this date?

0 1 2 3 4 5 6 7 8 9 10

LIFE SATISFACTION

11. How satisfied are you with your quality of life?

0 1 2 3 4 5 6 7 8 9 10

12. In all, how would you rate the difference of having a peer support volunteer available to you made in your early recovery. Please rate and circle on the scale below ('0' means no difference and '10' means the best possible difference).

0 1 2 3 4 5 6 7 8 9 10

(please circle one)
REALIZED BENEFITS OF SURGERY

13. Prolonged life? □ Yes □ No
14. Freedom from pain and fatigue □ Yes □ No
15. Improved quality of life □ Yes □ No
16. Return to former activities □ Yes □ No
17. Travel and recreation □ Yes □ No
18. Personal goal stated before surgery □ Yes □ No

19. If you were to consider having surgery again, would you choose it?
   □ Yes □ No

20. Are you satisfied with your decision to have surgery?
   □ Yes □ No

21. Is there anything else that you would like to share about having cardiac surgery that might help me understand your experience?

________________________________________________________________________
________________________________________________________________________

Thank you for your time.

* This questionnaire was modified for use by Colella, with permission from Dr. Kathryn King, RN, PhD, University of Calgary, from its originally published version (Gortner, Jaeger, Harr & Hlatky, 1994).
The Peer Support Evaluation Inventory (PSEI) is a questionnaire that was developed to help you tell us about your peer support experience. This instrument has four subscales, all of which evaluate different aspects of the support you received.

**Directions:**

_In answering the following questions, please think about your peer support experience. The following questions ask you to pick a number which best describes your feelings. While you may not find an answer that exactly matches your feelings, please indicate the number which comes closest to how you feel._

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
<td>Disagree</td>
<td>Unsure</td>
<td>Agree</td>
<td>Strongly agree</td>
</tr>
</tbody>
</table>

**Example:** My peer listened to me talk about my feelings or concerns

1 2 3 4 5
When answering these questions think specifically about the interactions you had with your peer volunteer.

<table>
<thead>
<tr>
<th>In general, my peer:</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Unsure</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Provided me with practical information</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2 Listened to me talk about my feelings or concerns</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3 Helped me feel that I was not alone in my situation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4 Gave trustworthy advice</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5 Helped me feel that what I was going through was &quot;normal&quot;</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6 Expressed interest and concern about how I was doing</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7 Told me that I did something well</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8 Assisted me to solve my problems or concerns</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9 Expressed admiration for a personal quality of mine</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10 Told me what to expect in a certain situation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11 Accepted me for who I was</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12 Gave me feedback on how I was doing</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13 Told me what was usual for my current situation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14 Suggested other ways of doing things</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15 Told me that help was available when I needed it</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
### Part II: Relationship Qualities

*When answering these questions think specifically about the relationship you had with your peer volunteer.*

<table>
<thead>
<tr>
<th>In general:</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Unsure</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. With my peer I could confide my most inner feelings</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. My peer could tell when I was worried about something</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>If something important happened to me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. I could share the experience with my peer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I knew that whatever I said was just between us</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. My peer was trustworthy</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. My peer was dependable</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. I knew my peer would respond to me in a supportive way</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. I felt accepted by my peer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. I felt comfortable ‘just being myself‘ with my peer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. My peer understood my point of view</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. My peer felt bad if things didn’t go well for me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. My peer influenced how I felt or acted</td>
<td>1</td>
<td>2</td>
<td>3</td>
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</tr>
<tr>
<td>12. I felt close to my peer</td>
<td>1</td>
<td>2</td>
<td>3</td>
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</tr>
<tr>
<td>13. I felt comfortable getting close to my peer</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>14. I depended on my peer</td>
<td>1</td>
<td>2</td>
<td>3</td>
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</tr>
<tr>
<td>15. My peer invested time to help me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>In general:</td>
<td>Strongly disagree</td>
<td>Disagree</td>
<td>Unsure</td>
<td>Agree</td>
<td>Strongly agree</td>
</tr>
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</tr>
<tr>
<td>17 My peer worked at maintaining a relationship with me</td>
<td>1</td>
<td>2</td>
<td>3</td>
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</tr>
<tr>
<td>18 My peer was an important source of support for me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19 I looked forward to talking with my peer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20 My peer would get over-involved in my problems</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>21 My peer pressured me to change</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>22 My peer made me feel guilty</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>23 My peer made me feel angry</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24 My peer was critical of me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>25 My peer minimised my problems</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>26 My peer was interesting and enjoyable to talk to</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>27 My peer presented a good first impression</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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</tr>
<tr>
<td>28 My peer revealed personal information</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>29 My peer talked too much</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>30 My peer was sensitive and understanding</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>31 My peer seemed like she would be able to talk to anyone</td>
<td>1</td>
<td>2</td>
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</tr>
</tbody>
</table>
**Part III: Perceived Benefits**

*When answering these questions think specifically about how you feel your peer volunteer helped you.*

<table>
<thead>
<tr>
<th>Over the past couple of months I generally feel:</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Unsure</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are more people I can turn to</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><em>My peer helped me feel this way</em></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>More trust towards my community</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><em>My peer helped me feel this way</em></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Feel less worried</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><em>My peer helped me feel this way</em></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>More confident in my ability to care for myself</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><em>My peer helped me feel this way</em></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>More satisfied with myself</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><em>My peer helped me feel this way</em></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>More able to solve problems or concerns</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><em>My peer helped me feel this way</em></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Less isolated from others</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><em>My peer helped me feel this way</em></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Life is more enjoyable</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><em>My peer helped me feel this way</em></td>
<td>1</td>
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</tr>
<tr>
<td>Over the past couple of months I generally feel:</td>
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<td>Unsure</td>
<td>Agree</td>
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<td>-----------------------------------------------</td>
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</tr>
<tr>
<td>Things are going my way</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><em>⇒</em> My peer helped me feel this way</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>More confident in my abilities</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><em>⇒</em> My peer helped me feel this way</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Less negative thoughts about myself</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><em>⇒</em> My peer helped me feel this way</td>
<td>1</td>
<td>2</td>
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<td>5</td>
</tr>
<tr>
<td>More similar to other cardiac surgery patients</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><em>⇒</em> My peer helped me feel this way</td>
<td>1</td>
<td>2</td>
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<td>5</td>
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<tr>
<td>Better able to cope with all the things I have to do</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td><em>⇒</em> My peer helped me feel this way</td>
<td>1</td>
<td>2</td>
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<td>5</td>
</tr>
<tr>
<td>I am more likely to get help if I need it</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><em>⇒</em> My peer helped me feel this way</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>I have something in common with other patients</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><em>⇒</em> My peer helped me feel this way</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>More calm</td>
<td>1</td>
<td>2</td>
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<td>5</td>
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<tr>
<td><em>⇒</em> My peer helped me feel this way</td>
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<tr>
<td>Better able to respond to stressful situations</td>
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<td>5</td>
</tr>
<tr>
<td><em>⇒</em> My peer helped me feel this way</td>
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<td>2</td>
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<td>5</td>
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<tr>
<td>Less alone</td>
<td>1</td>
<td>2</td>
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<td>4</td>
<td>5</td>
</tr>
<tr>
<td><em>⇒</em> My peer helped me feel this way</td>
<td>1</td>
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<td>5</td>
</tr>
<tr>
<td>Over the past couple of months I generally feel:</td>
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<td>Unsure</td>
<td>Agree</td>
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</tr>
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</tr>
<tr>
<td>More knowledgeable about my situation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><img src="image" alt="My peer helped me feel this way" /></td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>More in control of important things in my life</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><img src="image" alt="My peer helped me feel this way" /></td>
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<td>2</td>
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<td>4</td>
<td>5</td>
</tr>
<tr>
<td>More on top of things</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><img src="image" alt="My peer helped me feel this way" /></td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>A more positive attitude toward myself</td>
<td>1</td>
<td>2</td>
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<td>4</td>
<td>5</td>
</tr>
<tr>
<td><img src="image" alt="My peer helped me feel this way" /></td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>More confident to deal with my situation</td>
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<td>2</td>
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<td>5</td>
</tr>
<tr>
<td><img src="image" alt="My peer helped me feel this way" /></td>
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<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Less tense</td>
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<td>2</td>
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<td>4</td>
<td>5</td>
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<tr>
<td><img src="image" alt="My peer helped me feel this way" /></td>
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<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I have much more to be proud of</td>
<td>1</td>
<td>2</td>
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<td>4</td>
<td>5</td>
</tr>
<tr>
<td><img src="image" alt="My peer helped me feel this way" /></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>More control of my situation</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
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<tr>
<td><img src="image" alt="My peer helped me feel this way" /></td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>Less depressed</td>
<td>1</td>
<td>2</td>
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<tr>
<td><img src="image" alt="My peer helped me feel this way" /></td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
When answering these questions think specifically about how satisfied you feel about the support you received.

<table>
<thead>
<tr>
<th>In general:</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Unsure</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 My peer provided the assistance I needed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2 My peer met my expectations</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3 I liked my peer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4 My peer was respectful to me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5 Receiving support from my peer was convenient for me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6 I was able to talk to my peer when I needed to</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7 My peer telephoned when planned</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8 I had enough contact with my peer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9 I liked the support over the telephone</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10 I had very few problems with the support I received</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11 There is nothing I would have liked done differently</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12 I would recommend this type of support to a friend</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13 For my situation one-to-one support was better than group support</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14 Overall, I am satisfied with my peer support experience</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Is there anything else you would like to tell us about your peer support experience?

____________________________________

____________________________________

____________________________________

Thank you so much for taking the time to complete this questionnaire.

(PSEI adapted for use in this study with permission from author, Cindy-Lee Dennis, RN, PhD, Faculty of Nursing, University of Toronto).
HEALTH RECORD AUDIT

Name: ____________________________  Group: Intervention or Control (circle)
Dates: __/__/__  __/__/__  __/__/__  Surgeon: ____________________________
Admission OR Discharge
Admission Dx: ____________________  Urgent surgery or Elective (circle one) (emergent not eligible)
Age: ______  Sex: ______
Race: ______  (1-White, 2-Black, 3-First Nations, 4-South Asian, 5- East Asian, 6- other)
Hospital record # __________________

Admission Symptoms (0-no, 1-yes)
Angina ___
Syncope ___
PND ___
Shortness of breath ___
Fatigue/weakness ___
Other ______

CABG surgery (conduits used) ___
Please outline:
1- n/available
2- internal mammary
3- saphenous
4- both
5- radial

Medical history (0-no, 1-yes)
Congestive heart failure ___
Cancer ___
Clinical Depression ___
Other ______
# previous MI ___
# previous PTCA ___
Previous surgical history ___
Outline ____________________________

CPB Pump time ______ minutes
Off pump ______ (0-no, 1-yes)

Complications (0-no, 1-yes)
Identify ____________________________

Risk Factors (0-no, 1-yes)
Hypertension ___
Diabetes mellitus ___
Hyperlipidemia ___
Family history of CAD ___
Smoking ___
Alcohol intake ___

Myocardial function
Preop ejection fraction ___ %
Preop CCS Classification ___

Extent of vessel Disease (0-no, 1-yes)
Left main ≥ 70% ___
LAD ≤ 70% ___
Circumflex ≥ 70% ___
Right Coronary artery ≥ 70% ___
### Mood-Altering Drugs/Medications

#### Admission (circle if applicable)  
☐ Not applicable (check if not on MA drugs)

#### Classification

##### SSRI Antidepressants
- Celexa (Citalopram)
- Zoloft (Sertraline)
- Paxil (Paroxetine)
- Prozac (Fluoxetine)
- Luvox (Fluvoxamine)

##### MAOI
- Nardil (Phenelzine)
- Parnate (Tranylcypromine)
- Marplan (Isocarboxazid)

##### TCA's
- Aventyl (Nortriptyline)
- Elavil (Amitriptyline)
- Norpramin (Desipramine)
- Tofranil (Imipramine)
- Remeron (Mirtazapine)

##### Other
- Effexor (Venlafaxine)
- Wellbutrin (Bupropion)
- Serzone (Nefazodone)
- Desyrel (Trazodone)

Other: (please identify)

---

#### Discharge (circle if applicable)  
☐ Not applicable (check if not on MA drugs)

#### Classification

##### SSRI Antidepressants
- Celexa (Citalopram)
- Zoloft (Sertraline)
- Paxil (Paroxetine)
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- Effexor (Venlafaxine)
- Wellbutrin (Bupropion)
- Serzone (Nefazodone)
- Desyrel (Trazodone)

Other: (please identify)

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*Adapted for use in this study, with permission from Dr. Kathryn King, RN, PhD, University of Calgary (From the originally published version (Gortner, Jaeger, Harr & Hlatky, 1994).*
Appendix D

Included in this appendix are:

(i) The Peer Volunteer Training Manual Overview
(ii) Peer Volunteer Call Template/Log
(iii) Peer Volunteer Confidentiality Agreement
(iv) Informed Consent for Peer Volunteers
Welcome

Section I: Introduction
  The Research Study & Team
  Training Session Agenda
  How to use this manual

Section II: The Peer Volunteer
  What is a peer volunteer
  Building on your current skills as a peer volunteer
  Peer Volunteer Activity Diary
  Peer Volunteer Call Template
  Frequently asked Questions
  Peer Volunteer Contacts
  Confidentiality Agreement
  Peer Volunteer Demographic Form

Section III: Providing Peer Support after Discharge
  Emotional Support
  Informational Support
  Appraisal/Validation Support
  Benefits

Section IV: Communication
  Establishing Telephone Contact
  Maintaining Contact
  Components of Effective Listening
  Open-ended Questions
  Effective Communication & Sharing of your lived experience
  Problem Solving & Identification
    - Algorithms as guides

Section V: Recovery
  Dispelling the myths of cardiac surgery
  Common questions during recovery at home
  Psychosocial recovery: Depression after surgery
  Physical recovery and norms
  Cardiac Rehabilitation
Peer Volunteer Participation and Confidentiality Agreement

I, ____________________________ agree that I will fulfill my peer volunteer responsibilities, as described to me by Tracey Colella RN, PhD (candidate) for the study Project Title: The Effect of a Professionally Guided Telephone Peer Support Intervention on Early Recovery Outcomes in Men following Coronary Artery Bypass Graft Surgery.

I also agree that I will comply with the policies and procedures of the study and Sudbury Regional Hospitals with respect to confidentiality. Except when I am legally authorized or required to do so for study purposes, I will not disclose information about the persons participating in the study, or give to any person any information or document that comes to my knowledge or possession by reason of my affiliation with this study.

I have read this policy on confidentiality of information and understand that a breach of this policy is cause for termination of my volunteer affiliation with this study and that this breach will be communicated to the (organization name) and the institution (name).

_________________________________  ________________
Signature  Date

_________________________________  ________________
Witness  Date
Informed Consent Form for Peer Volunteers

Project Title: The Effect of a Professionally Guided Telephone Peer Support Intervention on Early Recovery Outcomes in Men following Coronary Artery Bypass Graft Surgery.

Supervisor:
Dr. Kathryn King, RN, PhD
Associate Professor, Faculty of Nursing
University of Calgary
Phone: 403-220-4643

Student Investigator:
Tracey Colella, RN, ACNP, MScN
PhD Candidate, Faculty of Nursing
University of Calgary
Phone: 705-523-0643

This consent form, a copy of which has been given to you, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take time to read this carefully and to understand any accompanying information.

The purpose of this study is to learn more about the effect of a telephone peer support intervention on specific aspects of early recovery (such as physical and psychological recovery (depression) and use of health care resources) after heart surgery.

Recovery from heart surgery involves not only physical recuperation but also psychological adjustment. Peer support is a type of social support that is provided by people who have successfully recovered from heart surgery. This form of social support may assist people as they recover from heart surgery. The effect of telephone peer support on people’s recovery from heart surgery has not been well studied.

If you choose to participate in this study as a peer volunteer, you will be contacted by the investigator to complete a training session (approximately 2-3 hours). The focus of this session will be to provide you with an overview of your role as a peer volunteer in this study, as well as to provide you with information and materials that may be helpful to you when providing peer support. *You will also be required to sign a peer volunteer confidentiality agreement.*

As a peer volunteer, you will be matched with cardiac surgery patients (maximum three at a time) and expected to make contact with them within three to four days after their discharge from hospital and then weekly (minimum, or as agreed to by you and the patient) for a total follow up period of six weeks. During this time, the patient may contact you if they have
questions or concerns that they feel may be best facilitated by an individual who has successfully recovered from heart surgery. The patients will be instructed to call 1-866-867-5055, a toll-free call center that will forward the message to you for follow up. Peer volunteers will not be required to distribute their home telephone contact number.

Telephone calls to patients should take no longer than 20 minutes per call. You may become fatigued or find the activity repetitive as a result of participating in this study. You are free to withdraw from the study at any time. Participation in this study is strictly voluntary. There will be no monetary cost to you to participate in the study. You will be asked to keep a diary of your contacts with patients (including things such as contact date/time, topics of discussion) and reminded to submit the diary (postage paid) upon study completion. A member of the research team will contact you and request that you complete an evaluation of the experience of providing peer support upon study completion.

Throughout the study, a cardiac nurse practitioner will be available via pager (705-XXX-XXXX) in order to provide resource support in the situation where a peer volunteer identifies an issue that is beyond his/her scope. The nurse practitioner’s role will be to establish contact with the patient, field concerns and advise accordingly. In the case of an emergency, the peer volunteer will instruct the patient to call 911 (or the peer volunteer will call for the patient).

Information from this study may be used for other studies but only after ethics approval is obtained. Some of your comments may be used in the final report or in presentations about the study but no one will be able to identify you by these comments. Your name and any information that may identify you will be kept confidential. The information you provide will be stored in a locked file. Only the research team members will have access to the information you provide when answering questions and to the information from your health record.

There may be no direct benefits to you from being in this study. The information and support that you provide may be of benefit to others having heart surgery. You may find the role of providing support rewarding and beneficial in further facilitating your own recovery.
SIGNATURES

Your signature on this form indicates that you have understood to your satisfaction the information regarding your participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the investigators or the involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time without jeopardizing your health care. If you have further questions concerning matters related to this research, please contact:

Tracey Colella          (705) 523-0643

OR

Dr. Kathryn King        (403) 220-4643

If you have any questions concerning your rights as a possible participant in this research, please contact Pat Evans, Associate Director, Internal Awards, Research Services, University of Calgary, at (403) 220-3782.

Participant’s Name  Signature and Date

Investigator/Delegate’s Name  Signature and Date

Witness’ Name  Signature and Date
Appendix E

Informed Consent for Study Participants
Informed Consent Form for Participants

Project Title: The Effect of a Professionally Guided Telephone Peer Support Intervention on Early Recovery Outcomes in Men following Coronary Artery Bypass Graft Surgery.

Supervisor:
Dr. Kathryn King, RN, PhD
Associate Professor, Faculty of Nursing
University of Calgary
Phone: 403-220-4643

Student Investigator:
Tracey Colella, RN, ACNP, MScN
PhD Candidate, Faculty of Nursing
University of Calgary
Phone: 705-523-0643

This consent form, a copy of which has been given to you, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take time to read this carefully and to understand any accompanying information.

The purpose of this study is to learn more about the effect of a telephone peer support intervention on specific aspects of early recovery (such as physical and psychological recovery and use of health care resources) after heart surgery.

Recovery from heart surgery involves not only physical recuperation but also psychological adjustment. Peer support is a type of social support that is provided by people who have successfully recovered from heart surgery. This form of social support may assist people as they recover from heart surgery. The effect of telephone peer support on people’s recovery from heart surgery has not been well studied.

If you choose to participate in this study, a member of the research team will see you in hospital to obtain your answers to a series of questions. These questions will focus on topics such as your perceptions of recovery, expectations for recovery, mood and social support.

If you are interested in potentially having contact with a peer volunteer, you will have this opportunity through random assignment (like flipping a coin). If you are assigned to Group One, you will receive the standard care for patients having heart surgery at this institution. This is called “usual care”; you will not receive the peer volunteer intervention but will complete the questionnaires before discharge from hospital and at six- and twelve-weeks follow up. If you are assigned to Group Two, you will be in the group that will have a peer volunteer assigned.
People assigned to Group Two (the intervention group) will be contacted by a peer volunteer within three to four days after your discharge from hospital and then weekly (minimum, or as agreed by you and the peer volunteer) for a follow up period of six weeks. During this time, you may also contact the peer volunteer if you have any questions or concerns that you feel may be best facilitated by an individual who has successfully recovered from cardiac surgery by calling 1-800-867-5055. The peer volunteer will then be notified of your request and will return your telephone call in a timely manner.

Regardless of your assigned group, once you are discharged from hospital, a member of the research team will also want to review your hospital record in order to obtain more information about your medical history and some aspects of your hospital stay. A member of the research team will contact you at six weeks and twelve weeks after your heart surgery. At these contacts you will be asked questions about your comfort, your ability to move around, your feelings about your mood and recovery, as well as your perceptions of social support. You will also be asked to report on the healing of your incisions and the use of health care resources (such as how many times you have visited your family physician or used homecare services).

Data collection interviews will take no longer than 20-25 minutes. You may become fatigued or find the activity repetitive as a result of participating in this data collection. If so, tell the research staff speaking with you so the interview can be done at another time. You are also free to withdraw from the study without any penalty or effect on your usual care. Participation in this study is strictly voluntary. There will be no monetary cost to you to participate in the study.

If you receive a score greater than or equal to 14 on the Beck Depression Inventory, the investigator will contact you and suggest medical follow up (for example, with your family physician or surgeon). A follow up telephone call will be made to you (by the investigator) 2 to 3 days after in order to ascertain whether or not medical follow up was sought.

Information from this study may be used for other studies but only after ethics approval is obtained. Some of your comments may be used in the final report or in presentations about the study but no one will be able to identify you by these comments. Your name and any information that may identify you will be kept confidential. You will have a code number that is known only to the researcher or assistant. The information you provide will be stored in a locked file. Only the research team members will have access to the information you provide when answering questions and to the information from your health record.

There may be no direct benefits to you from being in this study. The information you provide may be of benefit to others having heart surgery. You may find the support of a peer volunteer beneficial in facilitating your own recovery.
SIGNATURES

Your signature on this form indicates that you have understood to your satisfaction the information regarding your participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the investigators or the involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time without jeopardizing your health care. If you have further questions concerning matters related to this research, please contact:

Tracey Colella       (705) 523-0643

OR

Dr. Kathryn King     (403) 220-4643

If you have any questions concerning your rights as a possible participant in this research, please contact Pat Evans, Associate Director, Internal Awards, Research Services, University of Calgary, at (403) 220-3782.

Participant’s Name

Signature and Date

Investigator/Delegate’s Name

Signature and Date

Witness’ Name

Signature and Date
Included in this appendix are:

(i) The Peer Volunteer Algorithms
(ii) Red Flag/Emergent Issues
Algorithm for Peer Volunteers re: RED FLAGS requiring ACNP follow up

**RED FLAGS (requiring ACNP referral)**

- Fever greater than 38.5 degrees Celsius (or 101 degrees Fahrenheit)
- Increased swelling of ankles and weight gain of more than 2-3 lbs (.9 -1.3 kg) over two days
  - Change in incision drainage:
    - that is red or looks like pus, a gaping or opening of the incision
  - Change in appearance of the incisions:
    - increased redness, swelling, pain, hot to touch
    - Persistent nausea and vomiting
    - Persistent dizziness, lightheadedness
    - Excessive sweating and/or excessive fatigue
    - Severe bruising for no apparent reasons (especially if on blood thinner)

- Peer volunteer to page ACNP
- NP will follow up with the subject
Algorithm for Peer Volunteers re: Emergent Issues Requiring Immediate Follow up

EMERGENT ISSUES REQUIRING IMMEDIATE FOLLOW UP

- Chest pain and/or angina-like chest pain similar to what was experienced prior to surgery
  - Fast, irregular heartbeat and/or palpitations and/or feeling like you're about to pass out or you have passed out
    - Shortness of breath that continues once you stop activity or while at rest
      - Blood in the urine or stool (dark tarry stools)
        - Sharp chest pain and/or shoulder pain that gets worse with deep breathing or coughing
          - GO TO THE NEAREST EMERGENCY ROOM OR CALL 911
Appendix G

ACNP Algorithms
Nurse Practitioner Algorithm: Fielding calls from Peer Volunteers that require follow up

Role Definition: For the purpose of this study, the acute care nurse practitioner (ACNP) will serve as a ‘safety net’ ensuring that problems or identified issues are addressed and followed up.

Peer Volunteer identifies problem beyond his/her scope

- Identified as Emergency
  - Call 911/Go to ER

- Requires Follow up with ACNP/Non-Emergent – Page ACNP
  - Volunteer identifies subject and issue
  - ACNP contacts subject via telephone

ASSESSMENT

PLAN
Identify plan of care
Follow up plans (ER, GP, Sx, Clinic)

EVALUATION
Call back patient (within 1 day) to ensure follow-up care was sought.