PERCEPTIONS OF LEARNING NEEDS FOR
PATIENTS WITH HEART VALVE REPLACEMENTS
FOUR TO TEN WEEKS AFTER HOSPITAL DISCHARGE

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Abstract

This study was undertaken because a review of the literature revealed that there had been limited research pertaining to the learning needs of patients with heart valve replacements. The focus of the study was to determine what this patient population perceived their learning needs to be during the early weeks after hospital discharge, when they occurred, and how they should be addressed.

Ethical approval for the study was obtained from both the Vancouver Hospital and The University of British Columbia ethics approval committees. A descriptive methodology was used. Henderson's philosophy of nursing was used to assist in devising prompts for the semi-structured interview process. Eighteen patients were recruited from a local teaching hospital and interviewed in their homes four to ten weeks after hospital discharge. The interviews were taped and transcribed. Manifest and latent content analysis were used to analyze the data.

The results revealed many of the traditional cardiac learning needs applied to this patient population including such things as the need for education related to fatigue, mobility, emotions, activities of daily living, support and medication, exercises and the resumption of sexual activity. However, within these general categories, specific education requirements related to the valve replacement population were
noted. Information and education was required for such issues as the valve's life expectancy, the potential for valve failure, the anticoagulant regimen, and nutritional requirements. Participants also expressed valve related fears, and required time to adjust to these. The need for social support was expressed by all participants. It was determined that single people and women resumed various activities earlier in recovery than married and male participants. Participants preferred having their physicians educate them on a one to one basis about the recovery process, and believed post-operative education was best provided in hospital well before discharge.

Conclusions are drawn and the implications the results have for nursing education, practice, research and other health care professionals are discussed.
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CHAPTER ONE

Introduction

Diseases of the cardiovascular system remain the principal cause of premature morbidity, death and hospital days utilization in Canada (Dubois, Cassidy, & Wilson, 1994; O'Connor, 1987). In 1987, diseases of the cardiovascular system accounted for approximately 25 percent of all long term disability pensions paid by the Canada Pension Plan (O'Connor, 1987). Cardiac disorders can lead to chronic illness, disability and unemployment, all of which contribute to a less than productive lifestyle (King, 1994).

Deterioration in the functioning of one or more of the heart's valves is an example of a gradual chronic cardiac illness (Finkelmeier, Hartz, Fisher, & Michaelis, 1989). Progressive valve failure exacerbates cardiac symptoms, bringing with it the need for aggressive medical management and eventually surgery (King, 1994). When surgery is indicated, the patient requires information pertaining to the process of cardiac rehabilitation. This is typically accomplished through the process of patient education designed to assist the individual in developing the requisite knowledge, attitudes and behaviours required to manage recovery at home, thus assuring continuity in patient care (Boyd, 1987). Consequently patient education is an essential component of the rehabilitation
process (Canadian Council of Cardiovascular Nurses (CCCN), 1993; Lindsay, Jenrich, & Biemolt, 1991). Limited research exists pertaining to patients with heart valve replacements and their self-perceived learning needs during recovery (Hagenhoff, Feutz, Conn, Sagehorn, & Moranville-Hunziker, 1994). Determining these learning needs and including them in hospital discharge planning and rehabilitation programs will assist in meeting this patient population's needs once home, thus allowing the patient to regain an optimal level of functioning during rehabilitation (Boogaard, 1984; CCCN, 1993; Gilliss, 1984; Jillings, 1988; MacKenzie, 1993; Wingate, 1991).

Background

During the last three decades, advances in the diagnosis and treatment of heart defects have made a larger percentage of deficits operable (Lumpp, 1968; Wingate, 1991). From April of 1991 to March of 1992, 5719 valve replacement surgeries were performed in Canada (Statistics Canada, 1992). Of these, 841 cases were completed in British Columbia, with approximately the same number of male and female patients undergoing surgery (Statistics Canada, 1992). Rankin (1990) noted that historically a greater percentage of valve disorders have occurred in women, due to their increased incidence of rheumatic heart disease.

The first heart valve prosthesis was developed more than
thirty years ago (Nolan, 1992). Over the past three decades, more than sixty valve replacement devices have been conceived and rejected, but each has contributed to the current understanding of heart valve disease and performance (Nolan, 1992).

Heart valve diseases can be either congenital or acquired (King, 1994; Schakenback, 1987). Acquired diseases are significantly more common in those over the age of 30 and result predominantly from rheumatic heart disease, infections and calcification (King, 1994; Rosen, Klein, Rosen, Laczkovics, Rokitansky, & Beck, 1992; Utz & Grass, 1987; Schakenback, 1987; Wingate, 1987). Valve disorders are irreversible and progressive in nature with the aortic and mitral valves predominantly affected (King, 1994; Lumpp, 1968). Acquired valvular diseases include stenosis and regurgitation (King, 1994; Schakenback, 1987). Schakenback (1987) described valvular stenosis as a gradual narrowing of the blood flow pathway by the valve and its surrounding structures. Eventually, greater pressure is required to open the valve and allow for normal blood flow, increasing the work of the surrounding heart muscle. Regurgitation or insufficiency occurs when there is a poorly functioning or leaky valve. The blood flow through the valve becomes bi-directional, again increasing the work of the heart. Stenosis and regurgitation can occur in isolation or in combination with one or multiple
valves. Regardless, the result is a gradual decrease in cardiac function, an increased workload on either the right or left ventricle of the heart and complications such as pulmonary oedema, syncope and angina (King, 1994; Lumpp, 1968).

Manifestations of progressive chronic illness include pedal oedema, shortness of breath, decreased activity tolerance, malaise, fatigue, fever and chest pain (King, 1994; Utz & Grass, 1987).

Those individuals affected are compelled to make significant changes in their patterns of daily living (Utz & Grass, 1987). Such changes include working less (or not at all), limiting physical activities (eg. moving to one floor of a house in order to avoid stairs), instituting a medication regimen, limiting social interactions, and dietary changes. Consequently, the replacement of a diseased valve with a new mechanical, mosaic or porcine prosthesis has offered the hope of longevity and improved quality of life to those who undergo surgery (King, 1994; Lumpp, 1968).

Due to the chronic nature of valve disease, surgery followed by seven to ten days in hospital is not in itself, a cure for the patient (Costello, 1992; Wingate, 1991). Consequently, much patient anxiety regarding recovery during the ensuing days and weeks is common (Wingate, 1987). Once discharged home, the patient is without the support and guidance of nurses, physicians, physiotherapists and other
health care professionals, thereby potentially producing
greater anxiety (Gilliss, 1984). The uninformed patient may
experience difficulty in exerting control over needed lifestyle
changes such as anticoagulation therapy and exercise (Wingate,
1987). Patient anxiety and the necessary lifestyle changes
combined with the patient's significant physical deconditioning
due to the valve disease process, make patient education and
cardiac rehabilitation imperative (Costello, 1992; Marshall,
1985; Wingate, 1987).

A variety of pre-discharge and post-hospital patient
education and rehabilitation programs have been developed by
health care professionals to address heart valve patients'
learning needs in the recovery period. Typically, information
related to diet, medication, activity and related restrictions,
rest, resumption of sexual activity, smoking, incision care,
pain management, psychosocial issues (mood swings, anxiety and
depression) and post-operative complications is provided by the
nurse prior to hospital discharge (Beckie, 1989; Bubela,
Galloway, McCay, McKibbon, Nagle, Pringle, Ross, & Shamian,
1990; Hill, 1989; Karlik & Yarcheski, 1987; Marshall,
Penkofer, & Llewellyn, 1986; Scalzi, Burke, & Greenland,
1980).

As demonstrated, post-operative teaching has been designed
to cover a wide variety of material. However, obstacles to
patient learning in hospitals exist. Bubela et al. (1990)
noted that with the current trend towards early hospital discharge the patient may not have the "physiological stability or cognitive energy to learn" (p.21; Wingate, 1991) the required material. In addition to not being ready to learn, patients may not know what they need to learn, being unaware of the difficulties that will arise once home (Bubela et al. 1990). Thus, the education and information provided must be concise and relevant (Jillings, 1988).

This author has observed that patient education programs have been structured around the learning needs common to patients who have had either coronary artery bypass graft surgery (CABG) or a myocardial infarct (MI), and not around those of patients with heart valve diseases. Clinical observations made by this author and others have revealed that post-operative and post-hospital learning needs for patients with heart valve diseases differ from those of CABG and other cardiac patients (King, 1994; Wingate, 1991). This is due, in part, to the chronic nature of cardiac illness (eg. the physically deconditioned heart valve patient). It also stems from the nature of the valves themselves because the various prostheses employed continue to have limitations. For example, mechanical valves are potentially thrombogenic, therefore once discharged from hospital recipients must be instructed to undergo daily prothrombin time evaluation during the first few weeks after hospitalization and monthly for life thereafter.
(Costello, 1992; Fitzpatrick & McConne, 1991; Hammermeister, Sethi, Henderson, Oprian, Kim, & Rahimtoola, 1993). This patient population requires instruction regarding the side effects and risks associated with the use of anticoagulants (Fitzpatrick & McConne, 1991). They require teaching and support in order to adapt to the constant clicking of the new valve, recognize the increased susceptibility to endocarditis and ensure prophylactic antibiotic therapy prior to having dental work (Finkelmeier et al. 1989; Fitzpatrick & McConne, 1991; Shaffer, Schulkers, & Wexler, 1991). Those with biological valves also have special learning needs due to this valve's ten year average life span (Nolan, 1992). The recipients must adjust to having a foreign substance in their bodies which may break or fail, potentially resulting in the need for emergency care or further surgical interventions (Finkelmeier et al. 1989; Shaffer, et al. 1991; Utz & Grass, 1987; Wingate, 1987). Women of child bearing age also require special consideration with regards to the type of valve implanted and anticoagulation, because their choice will greatly affect their child bearing potential (Rosen, Klein, Rosen, Laczkovics, Rokitansky, & Beck, 1992).

Jenkins, Stanton, Savageau, Ockene, Denlinger, and Klein (1983) have established that patients who have CABG and valve surgery experience a variety of learning needs during the first eight weeks at home. Tack & Gilliss (1990), and Wiggins (1989)
supported this, stating that the crucial time for nursing intervention related to patient education and support was during the immediate post-hospitalization period. As well, Grady, Buckley, Cisar, Fink & Ryan (1988) concluded that learning needs change over time during recovery. In order to ensure that heart valve patients learning needs were explored as fully as possible, this study examined learning needs up to the first ten weeks after hospital discharge. Patients were home a minimum of four weeks prior to the interview, thereby ensuring they have had time to determine or encounter any potential learning needs.

Patient education has been established as an essential component of the cardiac rehabilitation process (Canadian Council of Cardiovascular Nurses, 1993; Beckie, 1989; Tack & Gilliss, 1990). However, the professionals' perceptions of learning needs, and not those of the patient have often been used as the basis for developing patient education programs (Hart & Frantz, 1977; King, 1994). Disparity remains amongst health professionals and in the literature regarding what information is needed and deemed most helpful in assisting the patient to understand the cardiac illness, and develop the requisite knowledge base required for recovery (Jillings, 1988; Moynihan, 1984; Stanton, Jenkins, Savageau, Harken, & Aucoin, 1984). As Jillings (1988) noted, it is a mistake to "assume that what professionals know about pathophysiology and disease
is what clients need to know" (p.210).

Nurses are in constant interaction with patients, observing, caring for and counselling them (Henderson, 1964). Consequently, patient education has come to be considered a nursing responsibility (Bubela et al. 1990; Comoss, Burke, & Swails, 1979; Duryée, 1992; Finkelman et al. 1989; Marshall, 1985). Henderson (1991) stated that effective nursing involves a constant assessment and validation of the professional's interpretation of patient needs with the patient. Yet when interviewed after hospital discharge, cardiac patients have often stated that they have had little or no discharge information provided. (Cooke & Alley, 1992; Raleigh & Odtohan, 1987).

There are a number of possible reasons why patient education has been less than optimal. The perceived deficiency may historically stem from a lack of nursing preparation at an academic level, a lack of time, or the nurses' perception that patient education was not a priority. Additionally, it may arise from the lack of knowledge regarding what to teach the patient (Baker, 1989). Regardless of the reason, patient education must be geared toward what the patient "must know" and perceives as important to know for discharge and rehabilitation. Nurses need to think beyond the hospital setting to what patients will need, in order to effectively recover once home (Cooke & Alley, 1992). Ultimately, it must
be remembered that even if patient teaching is undertaken, it does not mean that learning has taken place.

While the literature is replete with research pertinent to the learning needs of patients who have had MIs and CABGs, no research was found that dealt exclusively with heart valve replacement patients' self-perceived learning needs in the early weeks after discharge. Furthermore, a review of the literature revealed that many studies using CABG patients contained forced response questionnaires designed by the researchers (Grady, Buckley, Cisar, Fink, & Ryan, 1988; Stanton, Jenkins, Savageau, Harken, & Aucoin, 1984). Thus respondents may have been unable to indicate what they perceived to be their true learning needs. Instead, they would have tailored their responses to fit the pre-defined questions established by the researcher.

Despite decades of nursing and medical research aimed at identifying patients' needs, research pertaining to the learning needs of patients with heart valve disease is lacking (Hagenhoff et al. 1994; Moser, Dracup, & Marsden, 1993). To effectively recover from surgery and achieve a state of optimal health, patients with heart valve replacements must have their learning needs clearly identified. This is the first step leading to a comprehensive patient education and rehabilitation program, which will translate into improved patient care (Moser et al. 1993). A study of this patient population's learning
needs four to ten weeks after hospital discharge was required to fully identify what patients perceived as important to know for early recovery and the fulfilment of independence once home.

Problem Statement

In order to establish a comprehensive patient education program as part of the rehabilitation process, nurses must incorporate what patients perceive as important to know for the post-hospital experience. Therefore the problem under study was the lack of knowledge and perceived learning needs related to patients with heart valve replacements following hospital discharge.

Increased patient acuity, hospitalization, diagnostic studies, valve surgery and early hospital discharge are dramatic events which occur in as little as seven to ten days (Wingate, 1991). Patient education is currently being provided during a time when the patient is feeling anxious and does not have the physical or cognitive ability to learn (Bubela et al. 1990). These events, coupled with the patient's "lack of strength, will or knowledge" (Henderson, 1991, p.21) required to accomplish the various activities of daily living create multiple learning needs for the patient once discharged from hospital.

Considerable research has been undertaken to explore the learning needs and rehabilitation of CABG patients (Sczekalla-
Meyer, & Latz, 1979; Stanton et al, 1984). Common findings from this research have been incorporated into patient education programs for patients with heart valve replacements prior to hospital discharge (Jenkins et al. 1983; Sczekalla-Meyer & Latz, 1979). However patients with heart valve replacements have learning needs which are unique and differ from those of patients with coronary artery disease (CAD) and to date these have not been clearly defined using empirical research (King, 1994; Wingate, 1991).

Since patients with heart valve replacements experience many learning needs in the early weeks after surgery, study participants were interviewed between four and ten weeks after hospital discharge.

Purpose of the Study

The purpose of this study was to determine the learning needs of patients with heart valve replacements. Specifically it sought to:

1. Determine what patients with heart valve replacements perceived their learning needs to be between four and ten weeks after hospital discharge;
2. Determine when the identified learning need(s) arose;
3. Determine if patients with heart valve replacements believed further post-operative or post-hospital patient education was required;
(4) Determine when patients with heart valve replacements believed this education would have been most helpful.

Research Question

The specific question used to guide the study was:
What learning needs do patients with heart valve replacements identify as having occurred during the first four to ten weeks following hospital discharge?

Theoretical Framework

Virginia Henderson's (1961) philosophy of nursing was used as a conceptual guide for the patient interviews in this study. This philosophy is rooted in Henderson's concept of man's fundamental human needs. She stated that all people have similar needs which are expressed and satisfied in varying ways and degrees of intensity, depending on the individual culture and style of living (Henderson, 1961). Furthermore, individual needs, and the motivation to meet those needs may be stronger in certain individuals than others (1961, p.6). Henderson has catalogued fourteen fundamental needs, including:

1. Breathe normally;
2. Eat and drink adequately;
3. Eliminate body wastes;
4. Move and maintain desirable postures;
5. Sleep and rest;
6. Select suitable clothes-dress and undress;
7. Maintain body temperature within normal range by adjusting clothing and modifying the environment;
8. Keep the body clean and well groomed and protect the integument;
9. Avoid dangers in the environment and avoid injuring others;
10. Communicate with others in expressing emotions, needs, fears, or opinions;
11. Worship according to one's faith;
12. Work in such a way that there is a sense of accomplishment;
13. Play or participate in various forms of recreation;
14. Learn, discover, or satisfy the curiosity that leads to normal development and health and use the available health facilities.

Henderson believed that when people have the "necessary strength, will or knowledge" (1991, p.21), they independently undertake those activities which contribute to meeting their various needs, thus attaining the goal of independence. However, if individuals, through a lack of strength, will or knowledge, are unable to meet their needs independently, the nurse serves as a facilitator, by becoming "the patient's prime helper..."(p.24), assisting in the recovery toward independence.

Henderson believes the nurse's unique function is that of: "assisting the individual, sick or well, in the performance of those activities contributing to health or its recovery (or to peaceful death) that he would perform unaided if he had the necessary strength, will or knowledge. And to do this in such a way as to help him gain independence as rapidly as possible" (Henderson, 1991, p.21).

Henderson's framework, which was in part conceptualized
from a rehabilitation perspective, relates well to patients with heart valve replacements because of its emphasis on the patient achieving independence in part through patient education. For both patients and their families, the cardiac surgical event and recovery from it are stressful times which may create a lack of strength, will or knowledge required to meet individual needs (Henderson, 1991). During recovery from cardiac surgery, the nurse is able to assist the patient and family by providing patient education concerning recovery and rehabilitation (Henderson, 1991). This facilitative process assists patients in meeting their specific learning needs, thus maintaining or eventually re-establishing patient independence (Henderson, 1991).

Henderson's fourteen needs were used as prompts when conducting the participant interviews. It was recognized from the outset that not all of the needs would be applicable to every person interviewed, however all 14 needs were included in the interview guide. This ensured that the participant's needs were thoroughly assessed. Henderson's philosophy was also useful when discussing the results of the study in relation to recovering from heart valve replacement surgery, regaining of patient independence, and timing of the provision of information.

Definition of Terms
Perceived Learning Need: A perceived learning need is a self-identified gap in knowledge or behaviour, or that which the patient identifies as requisite knowledge or behaviour in order to advance toward and achieve the goal of self-care and independence (Henderson, 1991).

Patients with Heart Valve Disease / Replacement: A person who has undergone open heart surgery for an aortic, mitral, tricuspid and/or pulmonic heart valve replacement and has subsequently received nursing care. This person must be discharged to a home environment within 20 days of admission to the cardiac surgery unit.

Patient education: Patient education "is a process of deliberate, planned teaching that imparts information, encourages learner participation and stimulates the client's decision-making abilities" (Jillings, 1988, p.189). Through the process of knowledge acquisition and behavioural changes, patient education assists the patient during the rehabilitative process toward the goal of self-care and independence (Henderson, 1991).

Rehabilitation: "[Rehabilitation is] the sum of activities required to ensure cardiac patients the best possible physical, mental and social conditions so that they may by their own
efforts regain as normal as possible a place in the community and lead an active, productive life" (World Health Organization, 1964, p.3).

Assumptions

For the purposes of this study, the following assumptions were made:

(1) Patients with heart valve replacements, having had open heart surgery, would best speak of their own learning needs;

(2) Patients with heart valve replacements would encounter various learning needs once discharged from hospital;

(3) All patients with heart valve replacements would participate in the previously established, routine post-operative educational instruction provided by the teaching hospital;

(4) All participants would respond to the questions in an honest manner.

Limitations

Constraints or limitations placed on the study included:

(1) Participants for the study were from one local teaching hospital;
(2) Participation was limited to those who were able to speak the English language; consequently the learning needs of those who spoke other languages were not properly represented;

(3) The number of participants was limited, and the sample was one of convenience, which decreased the generalizability of this study.

Summary

Chapter one has introduced the problem, purpose and framework for this study. Patients with heart valve replacements encounter learning needs which differ from other cardiac patient groups. However, health professionals have yet to empirically inquire as to the patient's perceptions of the differing learning needs encountered by patients with chronic valvular illnesses. This has led to the untimely delivery of information and education that is not necessarily relevant. In turn, patient knowledge acquisition, behaviour, and the attitudes which guide their daily lives are affected. Because the nurse is presently the primary bedside patient educator, furthering the exploration of the patient's perspectives regarding their learning needs serves to improve the patient education provided.
The remainder of this thesis is organized into four chapters. In chapter two, the relevant medical and nursing literature have been reviewed, and the patient's learning needs and education are discussed. Chapter three presents a description of the study's methodology. The results of the study are presented and discussed in chapter four. Chapter five proposes conclusions to be drawn from the data, and reviews the implications for other health care professionals, as well as nursing practice, education, research.
CHAPTER TWO

Review of the Literature

This chapter examines the current state of the research literature as it pertains to the learning needs of patients undergoing heart valve replacements. This process assisted in placing the study in the context of work done by others. The review also provided a foundation to support the need for the research undertaken. There were no studies identified which dealt exclusively with the learning needs of patients with heart valve replacements during the first four to ten weeks after hospital discharge. However, there are several bodies of nursing and medical literature related to the rehabilitation and education of patients with other cardiac diseases, and these have been explored. The literature review has been organized into five sections including:

1. Cardiac rehabilitation;
2. Psychological adjustment to heart surgery;
3. Patient education;
4. Evaluation of patient education;
5. Patients' perceptions of their learning needs.

Cardiac Rehabilitation

Today's health care system is oriented toward treatment of acute illnesses (Thorne & Robinson, 1988). Unfortunately there
are no cures for chronic heart valve conditions. Consequently, chronically ill patients seeking medical attention require ongoing "care" for their illness (Thorne & Robinson, 1988). Rehabilitation programs for heart valve replacement patients constitute part of this care.

Post cardiac event individuals are often ambivalent when encouraged to engage in some form of rehabilitation. This is due to their prolonged illness, continued fatigue, activity intolerance, anxiety and fear (Utz & Grass, 1987). In a review of the literature, Certo (1985) concluded that the 1960s were witness to the formalization of cardiac rehabilitation programs for MI patients. This was undertaken in an effort to modify the lack of enthusiasm and anxiety encountered toward rehabilitation. Programs were developed based on progressive physical activity, activities of daily living and to some extent patient education (Certo, 1985).

The challenge for health care professions then and now has been to devise strategies effective in facilitating patient recovery, while simultaneously encouraging patient participation and control in the process (Jillings, 1988, p. 211). Today's goals of cardiac rehabilitation are broad, incorporating much more than simple progressive activity. They include the following: "(1) prevention of further impairment; (2) monitoring existing ability; and (3) restoring as much function as possible" (Diehl, 1989, p. 258).
To this end, much of the current nursing and medical research literature on rehabilitation pertains to the beneficial functional, physical, psychological and psychosocial facets of rehabilitation for patients who have experienced MI's and CABG's (Allen, Becker, & Swank, 1990; Dion, Grevenow, Pollock, Squires, Foster, Johnson, & Schmidt, 1982; Fletcher, Lloyd, & Fletcher, 1988; Holmback, Sawe, & Fagher, 1994; Roviaro, Holmes, & Holmstein, 1984; Wenger, 1986).

Physical and Functional Outcomes

As a part of the rehabilitation process, exercises aimed at improving the individual's physical and functional outcomes are often taught prior to hospital discharge (Allen, 1990). Dion, Grevenow, Pollock, Squires, Foster, Johnson, & Schmidt (1982) completed a prospective study pertaining to the medical problems and physiological responses encountered during early, low level exercise after cardiac surgery. They followed 521 patients with CABG and combination CABG with valve(s) replacements through surgery. An exercise program was instituted on the first post-operative day with stable patients. Sixty one percent of these patients ambulated for ten or more minutes. The study demonstrated that early activity was safe, because there were no increased risks of sudden cardiac death or serious complications with early, low-level exercise. This study is one in a series which has
successfully documented the need for early instruction and patient education pertaining to early activity in cardiac rehabilitation.

Roviaro, Holmes, & Holmstein (1984) examined the influence of a cardiac rehabilitation program on the functional status of 48 male MI and CABG patients after hospital discharge. The treatment group (n=28) was assigned to a three month exercise-based cardiac rehabilitation program. The control group (n=20) was assigned the routine treatment and did not undergo a routine rehabilitation class. The treatment group experienced lower resting heart rates (p=0.006), lower diastolic pressure, increased physical ability as evidenced by increased treadmill time (p=0.06), and lower exercise heart rates (p=0.059). Furthermore, patients in the treatment condition rated their physical exercise as more frequent (p=0.001), of longer duration (p=0.001) and more demanding (p=0.001).

Allen, Becker, & Swank (1990), surveyed 125 male CABG surgical patients to determine what factors were related to functional status during the first six months of recovery. Like the Roviaro study, Allen et al, (1990) found that patient functional status improved significantly from one month before to six months after surgery (p=0.0001). However six months after recovery, 45% of participants still reported difficulty with or no participation in moderately vigorous activity (such as lifting 10 lbs or more). Additionally, 45% reported doing
less or reported no changes in activity levels. Interestingly, a multiple regression analysis revealed that the best predictor of post-operative functional status was one's self-efficacy in performing activities of daily living. Measured prior to hospital discharge, self-efficacy explained 20% of variance in patient behaviours.

Hertanu, Davis, Focseneanu, & Lahman (1986), Marshall (1985), and Wenger (1986) support the need for early activity in patients who have had CABG's and MI's. Wenger (1986) positively correlated increased activity to a reduction of pulmonary atelectasis, thromboembolic complications and a reduction in anxiety and depression. Notably, Wenger (1986) concluded that patients with impaired left ventricular function, congestive heart failure and valve replacements who receive comprehensive pre and post-operative education pertaining to activity resumption, could safely participate in low level exercise programs planned for recovery.

The actual measures for functional outcomes varied between studies making comparisons difficult. Nonetheless, the research data suggests that patient self-efficacy assessments provide insight to the patient's functional status, and that patient education directed toward early activity resumption will assist in improving overall functional status.
Several attempts have been made to compare patients' functional and psychological status, because it has been hypothesized that one's functional status is related to psychological well being. For example, Holmback, Sawe & Fagher (1994) examined the long term effects of exercise in relation to psychological adjustment after an MI on 69 patients. Patients were randomized to control (n=35) and experimental (n=34) groups. Both groups were given a supervised exercise program designed by a physiotherapist. The program began eight weeks post-MI, and was instituted twice a week for 45 minutes with interval training including bicycling, calisthenics, jogging and relaxation. Those in the experimental group were encouraged to continue the training program after the 12 week session while the control group was not specifically instructed to do so. A self report questionnaire was provided to both groups in order to evaluate the relationship between perceived physical performance and psychological well-being. The validity, reliability and origin of the two tools were not reported in the study. Despite characteristic similarities in both groups, the 6 month and one year follow-up results showed no positive correlations between functional status and any of the variables for measurement of psychological well being for either the experimental or control groups. This is despite data regarding compliance to the exercise regimen being similar for both groups. The experimental group's fitness level was
only eight percent better than that of the control group (not statistically significant, p=.10). The experimental group (those encouraged to exercise) actually reported poorer psychological recovery than the control group. The long term psychological benefits of an exercise program were not seen. The study purports to having recruited generally healthier individuals which may partially account for this result. Those who were physically healthier prior to an MI would not have necessarily shown the physical improvements measured for with only moderate exercise twice weekly. Additionally a larger sample may have assisted in detecting the desired effects.

Jenkins, Stanton, Savageau, Ockene, Denlinger & Klein (1983) interviewed 89 patients with valve and bypass-valve combinations before surgery and again six months later. Their study, like the others, did not find any correlation between increased functional capacity and measures of psychological state including well-being, self-esteem and hope. The Jenkins study did not provide information as to what forms of intervention or rehabilitation were provided to the various groups; as such it is difficult to critique the interventions and results.

Bengtsson (1983), Roviaro et al. (1984), and Stern & Cleary (1982) reported similar conclusions when their studies failed to empirically validate the benefits of long term supervised exercise on various psychological variables. After
an extensive literature review and meta-analysis of works done, Greenland (1988) also concurred. He stated that as of 1988, despite the various measures used, there had not been any studies conclusively supporting a positive correlation between functional improvements resulting from rehabilitative exercise programs and improvements in psychological status.

Although not statistically significant, the Roviaro et al. (1984) study found that the treatment group rated their present health as better and had an overall better body and self-concept (p= 0.18). This result lends credence to the Allen et al. (1990) study which, as previously mentioned, established self-efficacy and not psychological well being as a predictor of functional status. Holmback et al. (1994) most succinctly concluded that physical conditioning is not "an isolated determinant of adaptation in cardiac disease" (p. 554) and that "sociopsychological issues and counselling" (p. 554) were essential components of the total cardiac rehabilitation program.

**Psychosocial Functioning**

Zyzanski, Stanton, Jenkins, & Klein (1981) examined psychosocial outcomes after heart surgery. Nine hundred and forty nine CABG and valve patients from the Mended Hearts Association responded to a questionnaire on average 3.5 years after their surgery. A strong positive relationship was
established between post-operative physical status and perceived psychosocial functioning. The researchers found that post-operative heart related complications and hospitalizations decreased psychosocial functioning. They further concluded that patients with valve and bypass replacements experienced similar post-operative social adjustments.

Several studies conducted since 1981 have supported the relationship between physical status and psychosocial functioning. The Jenkins et al. (1983) study reported that only 15% of patients had fewer social role functions such as house cleaning after their surgery and that their participants (n=89) overall functional status had improved. The treatment group in the Roviaro et al. (1984) study displayed similar results, reporting the house and yard work undertaken to be more physically demanding (p= 0.035), and an increase in sexual activity. Several years later, the Allen et al. (1990) study found similar results, with patients reporting a significant increase in social and leisure activity six months (p= 0.0001) post surgery.

Despite the positive correlations, it is difficult to know what specific components of the various treatment packages were responsible for the psychosocial effects observed. For example, while Jenkins et al. (1983) and Roviaro et al. (1984) included measures of marital relations in their psychosocial assessments, others did not. Additionally, the two studies
measured marital relations using different scales. Nonetheless, it is reasonable to conclude that one's psychosocial status will be somewhat dependent on physical and functional status. For, if serious chronic illness persisted despite surgical intervention, it would make one's psychosocial "activities" more difficult to undertake.

Return to Work

One of the main objectives of rehabilitation programs has been to increase the rate of return to work among all types of patients who have experienced heart surgery. Cronin (1990) stated that patients who perceived themselves as "ill or damaged" (p.17) post-operatively were less likely to return to work or engage in social activity, despite an improved post-operative functional status.

Allen (1990) concluded from a literature review that pre-operative work status may be a major predictor of post-operative employment. A period of invalidism greater than six months resulted in a 50 percent chance of permanent inactivity after surgery. Age, sex, education and income all affected return to work status.

Clancy, Wey and Guinn (1984) also studied influences on return to work after CABG. A significant relationship was found between the patient's perceptions of their ability to return to work and the actual return to work (p= 0.004). A
A further significant relationship was found between the individual's perception of ability level and return to work ($p = 0.01$), perception of physical ability and return to work ($p = 0.002$), perception of current health status as improved and return to work ($p = 0.008$). Consequently, patient perceptions are significant indicators of return to work after CABG surgery.

Researchers have sought to measure an increase in work related activities, but this is perhaps an inappropriate measurement and perhaps even a value judgment. For some a return to work is not appropriate or desired. For example, some people may choose to work less after surgery, thus deliberately reducing work related stress. Therefore an absolute increase in the number of persons returning to work or the number of hours worked, without an assessment of the individual's reasons for choosing to return or not return to work, is most probably a poor assessment of the situation. One also needs to examine how long the individual was off work before the surgery.

In summary, the studies previously noted serve to demonstrate the relationships between functional status and psychological and psychosocial outcomes. It is evident that exercise training alone does not return the individual to a fully functional state. Patient perceptions and self-efficacy are important variables in improving social and functional
ability and returning to work. Therefore discovering and clarifying patient perceptions is a requisite first step in the rehabilitative process if patients are to return to a level of optimal functioning.

Psychological Adjustment to Heart Surgery

Despite the lack of a proven relationship to functional outcomes, the psychological element of cardiac surgery plays a meaningful role in the patient rehabilitation process. Over a period of several months, most cardiac patients recover from their surgery and re-engage in many of their previous activities (Cronin, 1990). However many patients experience difficulties in adjusting to the surgical intervention and subsequent rehabilitation.

Meyer, Blacher & Brown (1961) were among the first to attempt to document patient psychological responses to mitral valve surgery. During 1957 and 1958, they observed 29 patients who had cardiac surgery and concluded that the individual "healthy or diseased, is highly susceptible to emotional influence" (p. 214). They concluded that certain patients experienced a "catastrophic reaction" (p. 197) to the procedure, in which patients are frozen, immobilized and apathetic. The case study descriptions provided insight to the many emotional changes which patients experience after open heart surgery. Intriguingly, the study concluded that in "some instances, the bad heart is regarded as a consequence of bad
deeds or bad thoughts..." (p. 215).

Responses to surgery vary within individuals and their families, with most finding the experience disorganizing and stressful (Rankin & Gilliss, 1987). Wilson-Barnett & Carrigy (1978) noted that as many as 50% of patients with CAD become invalids because of psychological and not physiological problems.

**Psychosis and Sleep Deprivation**

Cronin (1990) stated that patients who displayed emotional instability at the beginning of their illness were more likely to experience complications later in their illness trajectory. Emotional difficulties are occasionally encountered in the early post-operative hours with individuals who experience sleep deprivation and psychosis.

Adverse psychological adjustment to cardiac surgery has been accorded many names, including post-cardiotomy delirium (Blachly & Starr, 1964). During this time, the post-operative patient experiences a cluster of common signs and symptoms including agitation, paranoia, and occasionally violence (Mirka & Rukholm, 1993). Kloosterman (1991) noted that the incidence of reported delirium varied between 24% to 72% depending on the literature reviewed. The delirium cleared by about six weeks according to Jenkins et al. (1983) who found that during six week follow up visits, patients demonstrated improved logical memory.
Mirka and Rukholm (1993) cited historical research which suggests deep sleep deprivation due to the noise of an intensive care unit, is a potential cause of post-operative psychosis. Other potential factors include anaesthetic agents, cardiopulmonary bypass and the general stress of surgery. Documentation of this issue from the early 1950's onward has resulted in a greater understanding of the patient's adverse psychological adaptation to heart surgery. More importantly however, pre-operative teaching pertaining to the potential for such a reaction in patient education programs would help patients and families understand that mild post-operative disorientation is a potential but not unforeseen part of recovery from heart surgery.

Anxiety and Depression

In addition to post-operative psychosis, recent research has highlighted patient anxiety and depression as two of the most common psychological responses experienced by patients after surgery (Cronin, 1990; Jenkins et al. 1983; MacKenzie, 1993; Raleigh & Odtohan, 1987). Allen (1990) stated that some patients tend to be fearful and anxious about their physical state and recovery. This anxiety interferes with their ability to learn and ultimately recover (MacKenzie, 1993). Allen (1990) concluded that although not often noted in hospital, many patients become fearful, anxious, withdrawn and depressed.

Raleigh & Odtohan (1987) administered a State Trait
Anxiety Inventory (STAI) questionnaire to 18 patients. Using an experimental group (n=9) a patient education program was implemented and evaluated prior to and after the intervention. When surveyed before discharge the experimental group displayed decreased anxiety levels, while the anxiety of the control group increased. When tested after discharge the anxiety of both groups decreased. However the experimental group displayed a greater reduction in anxiety, and an increase in learning.

Jenkins et al. (1983) also found decreased post-operative anxiety as measured by the STAI scale (p=.0001) and an overall decrease in depression and improved mood state as measured by the McNair Profile of Mood States (POMS) (p=.01). Forty percent of patients in this study reported a quicker than anticipated psychological recovery. Although not statistically significant, Roviaro et al. (1984) found similar results. Consequently, despite the small sample size, Raleigh & Odtohan's results were supported, suggesting that patients who participate in patient education and rehabilitation programs benefited from the formalized patient education as evidenced by their decreased anxiety levels.

Rankin (1990) conducted a prospective longitudinal study to evaluate the differences in psychological recovery of male and female patients after CABG and valve procedures. She interviewed 93 male and 24 female patients pre-operatively and
at one and three months after hospital discharge via telephone. The POMS was used to measure mood disturbances and depression. Measures of validity and reliability were not provided for these tools. While all patients showed fewer mood disturbances over time (p=0.0001), female patients reported significantly fewer mood disturbances over time than men on the POMS. Over time, women scored higher in measures of family satisfaction, while men displayed greater amounts of anger. Despite the use of convenience sampling, Rankin had disproportionate group sizes with only 24 women and 93 men.

The results of this study were supported by MacKenzie (1993) who reported on the emotional responses of women with ischaemic heart disease four to six weeks after hospital discharge. Her literature review suggested that women typically experience greater emotional distress, anxiety and depression than men after hospital discharge. This was thought to be linked to women's gender role orientation in which perceived role responsibility negatively influenced the rehabilitation process (Boogaard, 1984; MacKenzie, 1993). Contrary to this, and in support of the Rankin (1990) study, MacKenzie's results demonstrated that of the 19 women studied (all MI's), high incidences of anxiety or depression were not found. However, the women did report feelings of loss of control and poor affect for four to six weeks after hospital discharge. In an earlier study, Zyzanski et al. (1981)
concluded that changes in anxiety levels, depression and general emotional status were significantly related to the person's sex and type of surgery. For example female multiple bypass patients reported feeling emotionally worse than male bypass patients in the weeks after surgery. The Zyzanski study was retrospective in nature, questioning participants on average 3.5 years after hospital discharge. Conversely, MacKenzie used a prospective design, but had a small sample size (n=19), therefore one has to question the generalizability of the results. Because of the methodological questions which arise from both of these studies, more research is required in this area.

From the aforementioned, one can conclude that information suggesting that the occurrence of post-operative psychosis is common, would be useful for patients and their family. Research evidence further suggests that educational sessions are successful in reducing patient anxiety after surgery. It would appear that men experience greater anger, and take longer to adjust to heart surgery than women. However more research is required to validate this. Further exploration and discovery of what the heart valve patient's perceptions and learning needs are regarding emotional responses and recovery from heart surgery will assist in the rehabilitative process. It may also assist the patient to develop the desired behaviours needed to avoid or work through anxiety or
depression. This is supported by Jillings (1977) who noted that since "pre-operative teaching has been demonstrated to reduce the incidence of post-operative complications, perhaps post-operative teaching strategies (focused on the needs perceived by the patient) would alleviate adverse emotional outcomes" (p. 64).

Patient Education

Varvaro (1965) noted that patients have a definite need for "planned, systematic teaching" (p. 115). Historical evidence for this is gleaned from Henderson's (1964) statement in which she declared that the "institutional regimen nevertheless often failed to change the factors in the patients way of living that had hospitalized him in the first place" (p. 64; 1991, p. 14). Diehl (1989) suggested that a rehabilitation program which incorporated a strong educational component, developed around the rehabilitation expectations of the patient and family would assist the patient to achieve the goals of recovery. As part of the rehabilitation process, an educational program should help the patient acquire new information, develop new skills, achieve competence in the application of skills, and assume behaviours that prevent further disability, ultimately facilitating a return to personal independence (Certo, 1985; Diehl, 1989; Jillings, 1988; Raleigh & Odtohan, 1987; Wenger, 1986). While the
educational process needs to transfer information, convey knowledge and change behaviours, it should most importantly result in a change in patient attitude (Jillings, 1988).

The process of patient education can be considered from both an ideological and practical perspective (Leino Kilpi, Iire, Suominen, Vuorenhimo, & Valimaki 1993). An ideological perspective stresses the importance of knowledge and information with regards to "patient autonomy, dignity and self respect" (Leino Kilpi et al. 1993). It is argued that pure education must entail a process of emancipation which is that of "liberating people to make their own decisions on their own terms" (Fahrenfort, 1987, p. 30). This occurs through the real discussion and exchange of information between two individuals.

The practical, paternalistic perspective is the one more often seen when nurses provide patient care. The inherent assumption is that patients who have an understanding of their condition will work towards pre-planned and articulated nursing or medical objectives and demonstrate compliance with their treatment regimen (Leino Kilpi et al. 1993). Currently the various theories regarding patient education are structured around the idea of changing patient behaviour (Webber, 1990). Webber (1990) noted that correcting patient knowledge deficits is not sufficient enough to educate the patient since personal, social and environmental factors can and do affect patient behaviour. Whether considering an ideological or practical
perspective, the education provided should serve to empower individuals toward self-care and independence, ensuring that they have the requisite skills and attitudes to prevent complications during their recovery process.

Patient Compliance

Patient education and its relationship to compliance has received much attention in recent years (Holm, Fink, Christman, & Reitz, 1985). However, the issue of compliance remains problematic from both an ideological and practical perspective because it is based on the assumption that "Dr. knows best" and on the assumed adherence to pre-defined objectives. When examining the literature related to compliance, it became evident that the physician "prescribed" or directed the patient or the overall rehabilitation program, the patient was told what to do and when. This is done with the expectation that compliance will be the end result (Fahrenfort, 1987; Fleming, 1992). A general assumption underlying compliance is that greater knowledge will lead to increased adherence to recommendations (Luker & Caress, 1989). Conversely, the concept of informed consent dictates the patient's right to choose. Therefore the physician or nurse cannot "prescribe" or force a patient to choose any activity or action. Because patients are free to accept or reject medical advice, measuring patient compliance seems an unproductive exercise (Lipetz,
Bussigel, Bannerman, & Risley, 1990). However, there is research evidence suggesting a generally positive correlation between patient education and compliance (Fahrenfort, 1987; Holm et al. 1985; Linde & Janz, 1979; Marshall, Penckofer, & Llewellyn, 1986).

The literature reviewed suggested that while patient knowledge is an important factor in compliance, there are other determinants to be considered (Linde & Janz, 1979; Raleigh & Odtohan, 1987). Clients must know and understand the regimen, agree with it, and choose to adhere (Miller, Johnson, Garrett, Wickoff, & McMahon, 1982). Consequently, one's intention to adhere seems most relevant to the concept of compliance.

Compliance has historically been used as an outcome measure when considering the effectiveness of patient education. This author contends that assessing patients' perceptions of their learning needs would improve patient education programs and assist in creating more realistic, mutually acceptable patient goals. This in turn would give rise to new outcome measurements pertaining to the effectiveness of patient education and rehabilitation. Consequently, it is possible that an assessment of patient learning needs will assist in changing the reference points or outcome measures used when evaluating education and its relationship to "compliance".
Evaluation of Patient Education

For nurses, doctors and other health professionals to spend time educating patients, they must believe that it is effective in imparting knowledge and that it can lead to an improved understanding of the patients' situation (Lipetz et al. 1990). Consequently, it is important to evaluate patient education. Patient feedback is an important source of information for this evaluation (Waitkoff & Imburgia, 1990). Evaluation data can assist health care providers to determine what constitutes relevant materials for patient education programs.

In 1977, Hart & Frantz surveyed 512 hospitals to describe the common characteristics of post-operative patient education programs for open heart surgery patients in the United States. Of the 358 hospitals which were actively performing heart surgery, 66% had programs designed to assist patients with their various post-operative and discharge learning needs.

Scalzi, Burke, and Greenland (1980) used a quasi-experimental time series design to evaluate the impact of an in-patient educational program on patients who had MI's and their families. The study revealed that the retention of information provided during the hospital stay was limited. However, continued instruction during the post-discharge phase improved patient's knowledge relating to medications, sexual and physical activity, weight reduction and treatment of chest
Steele and Ruzicki (1987) also evaluated the effectiveness of patient education during hospitalization. Using a controlled experimental design, CABG patients were tested using a knowledge acquisition survey. Unlike Scalzi et al. (1980), Steele and Ruzicki found that CABG patients who participated in the education programs demonstrated a significant increase in knowledge acquisition. This result was further supported six weeks after discharge when patients reported that they were able to follow their rehabilitation program. Steele & Ruzicki concluded that those preparing pre-discharge education programs should concentrate their efforts on the "immediate needs" (p.310) of heart patients. Like Scalzi et al. (1980), Steele and Ruzicki believe that patient education focused toward long-term behavioural changes is of limited effectiveness in hospital.

The results in the two cognitively based studies are conflicting. Scalzi et al. (1980) were unable to demonstrate an increase in knowledge after instruction however Steele and Ruzicki (1987) did. Scalzi's study used a small sample size (n=13 in the control group and n=19 in the experimental group), whereas the Steele study had 38 participants in each of the pre and post-test groups. As well, several of Scalzi's tools for data collection (knowledge, compliance and denial) had not been previously validated prior to their use. Conversely, Steele
and Ruzicki used previously validated tools.

The Steele study is supported by Raleigh and Odtohan (1987) who concluded that a structured teaching program was more effective in conferring knowledge about heart disease and rehabilitation. They concluded that post-cardiac event patient education positively influenced the rehabilitation process through knowledge retention. They further surmised that a lack of patient knowledge can lead to cardiac invalidism. The assertion of increased patient knowledge after instruction is additionally supported by Mills, Barnes, Rodell, and Terry (1985), and Roviaro et al. (1984) who reported an increase in patient knowledge directly attributable to their patient education program.

**Heart Valve Recipients and Education**

Fitzpatrick and McConne (1991) retrospectively audited 190 patients who had had valve surgery and were placed on an anticoagulation regimen. Patients were interviewed by telephone and asked about the occurrence of significant medical problems since their surgery. The level of patient knowledge pertaining to anticoagulation therapy was evaluated, although no description of the tool utilized was provided. Twenty-five percent of the patient group were not aware of the need for antibiotic prophylaxis during dental procedures. Nine cases of infective endocarditis were found, resulting in three deaths.
and six valve re-operations. Thirteen major bleeding episodes requiring hospitalization and transfusion were found, along with 18 thromboembolic events. The investigators simultaneously surveyed 232 local physicians by mail with a response rate of 65%, to establish what they perceived as adequate international normalized ratios (INR). The majority of patients (74%) did not know their latest prothrombin ratios or INR's, but greater than 50% of physicians felt patients could manage their anticoagulation regimen without medical assistance! Overall however, 95% of patients were pleased with the discharge education provided. A further discrepancy was noted amongst the physicians who reported acceptable international normalized ratios (INR) of less than one to greater than four. This study revealed discrepancies within the profession as to what is acceptable anticoagulation treatment. Confusion on the educators part undoubtedly leads to poor education and understanding for patients. The large number of adverse events demonstrate that patient education and understanding pertaining to effective anticoagulation management has been poorly undertaken. The study reinforces the need to improve patient education practices concerning anticoagulation regimens, as well as the need to improve patient awareness of the potential complications associated with taking the anticoagulants.

Finkelmeier, Hartz, Fisher & Michaelis (1989) in a follow
up of 509 valve patients also demonstrated a disturbing incidence of endocarditis (12%) and thromboembolic event (3%). Like Fitzpatrick and McCone (1991) they were concerned with the increased incidence of possibly preventable post-hospital complications. Finkelmeier et al. (1989) called for an emphasis on patient education by the nurse and improved follow up by the health care team after hospital discharge.

Patients' Perceptions of Educational Programs

A knowledge of the patient's perceptions of educational programs will assist in improving of the education program itself. When possible, improved programs should have increased emphasis on patient identified issues, and rely less on the researchers' assumptions of the heart patients' learning needs.

Stanton, Jenkins, Savageau, Harken & Aucoin (1984) conducted a longitudinal survey of the patient's perception of the adequacy of patient education after cardiac surgery. The study had 249 patients involved, (43 with valve implants). Data for this study were collected pre-operatively and at six month intervals for two years after hospital discharge. Data were collected using a standardized interview and a self-administered multiple choice questionnaire designed by the authors. These researchers noted that the patients reported having inadequate preparation with regards to changes in how others treat them (43.3%), emotional reactions (32.3%),
possible symptoms (24.2%), sexual activity (23.9%), and return to work (20.5%). The patients agreed that these issues had been addressed in their educational sessions but felt inadequately prepared to deal with them. The authors concluded that this discrepancy suggested in-hospital patient education programs could not provide a complete solution to the rehabilitation process. Instead, patients required post-hospital follow up, reinforcement and encouragement.

Interestingly, results of the study showed no significant correlation between patients' perceptions of adequacy of preparation and the subsequent fears and worries encountered at home. Fears and worries included such issues as job loss, heart valve life, noisy valve sounds, overexertion, repeat surgery, others reactions and travel. Stanton et al. (1984) added that these fears were generally realistic (eg. repeat surgery) and not exaggerated. Consequently, even those patients who felt well prepared for discharge experienced a small number of fears and adjustments during recovery. Whether patients perceived that the education received helped or hindered in the management of these fears was not reported.

Grady, Buckley, Cisar, Fink & Ryan (1988) completed a study on patients' perceptions of the importance and adequacy of preparation concerning pre-operative and post-operative information. One hundred bypass patients were recruited for the study and given a pre-discharge questionnaire designed by
the researchers. Fifty four people completed the post-discharge questionnaire. The patients were seen before surgery and 1-4 weeks after hospital discharge. The questionnaire completed used closed ended questions and a Likert type scale. Patients reported high pre-operative preparedness and high levels of importance to knowing about the type of surgery, intensive care environment and deep breathing and coughing exercises. However, like the Stanton study, they reported being unprepared for the emotional changes encountered. For discharge, patients ranked exercising at home as the only item high for both levels of importance and preparedness. Like the Stanton study, patients ranked medication side effects, questions regarding medications and diet planning as highly important but low in terms of perceived preparedness. Interestingly patients felt well prepared for the limitations in lifting, driving, resting and formal exercise programs, but these were of low importance to them. The results generally concluded that high school and college graduates ranked the importance and adequacy of information higher than did grade school patients. Younger patients perceived themselves as less prepared for rehabilitation, but also felt less of a need to be prepared.

From the above, one can note that even when patients do receive discharge education, it is not necessarily related to what they perceive as relevant information for their recovery.
Additionally, what educators perceive as important to teach was not necessarily what the participants ranked as important to learn. Patient education must be an integral component of the rehabilitation process. However it must be deemed relevant in order to assist with a rapid, holistic patient recovery.

Patients' Perceptions of Learning Needs

Clancy et al. (1984) stated that if "the patients perceive that their condition has not improved, the surgery cannot be called successful" (p. 371). Patient perceptions are an important variable over which patients have full autonomy (Clancy et al. 1984). Perceptions can be measured at differing intervals along a continuum such as before and after surgery, and as such can provide a wealth of data pertaining to rehabilitation.

A paucity of literature exists pertaining to the perceived learning needs of cardiac valve replacement patients after hospital discharge. Consequently, research studies examining patients' perceptions of post-operative teaching were reviewed along with studies which included valve patients as a sub-set of a larger group.

In a landmark research study, Dodge (1969) examined the general medical and surgical patients' perceptions of their cognitive needs and the relationship of various background factors to these perceptions. Dodge used open-ended questions
during a series of verbally administered interviews. She concluded that patients were particularly concerned with receiving the kinds of information which allowed them to "plan realistically for their immediate and long-range lives" (p.509). Patients did not concern themselves with things they were unable to understand. Dodge hypothesised that the degree of understanding desired by patients may be directly related to their level of education. The results have had some impact on the development of ensuing patient education programs.

Sullivan (1993) supported Dodge's claim during her assessment of the learning needs of pregnant women. Sullivan concluded that the pregnant women's learning needs and the information presented in the instructor planned pre-natal classes were disparate. For example, pregnant women did not see the value of "nutrition in the first trimester" counselling during third trimester pre-natal classes. Sullivan called for a paradigm shift in pre-natal education, from that of teacher controlled to a learner controlled system. If the information were accessible at a time convenient for pregnant woman (via computer, for example) when she is motivated to learn, it would have greater effectiveness, and it would adhere to the principle of adult learning.

Sullivan's (1993) proposed paradigm shift may have relevance and applicability in the cardiac rehabilitation domain. Patients with cardiac diseases may not be able to
articulate what they need to learn in hospital due in part to their narrow focus of what their learning needs might be. However greater emphasis on providing assistance after hospital discharge is supported by a number of authors (Beckie, 1989; McKnight Nicklin, 1986; Stanton et al. 1984).

Cardiac Patients' Perceptions of Learning Needs

A learning needs assessment for cardiac patients was conducted by Sczekalla-Meyer and Latz (1979). They interviewed 50 open heart surgery patients between one and nine months after surgery to establish what they perceived their learning needs to be once discharged from hospital. (Information was not provided as to the type of surgery the patients had). The study used a combination of open and closed-ended questions to elicit the required information. The results revealed eight major categories of concern as stated by patients. The categories included heart function, drugs to take, drugs not to take, surgical procedure, diet, care of the incision, activity, and complications. The investigators asked patients who the teachers were (the majority response was nurses), how helpful they perceived the teaching to be (overall, not very helpful), and if they had any other concerns about the recovery period. This last question brought about an outpouring of patient concerns around pain, resumption of activity, medication and warfarin therapy, diet and potential complications. These data
strongly suggested that patient teaching was inadequate. Based on the information received, Sczekalla-Meyer and Latz initiated changes to their patient education program.

Moynihan (1984) conducted a study which asked 17 patients who had experienced an MI to complete a questionnaire designed to elicit information pertinent to their post-discharge educational needs. At the time, there were no formal patient education classes in the community where the research was undertaken. Moynihan's results were similar to Sczekella-Meyer and Latz, reporting that 65% of patients stated they were not counselled regarding emotional responses encountered and 47% were not counselled regarding sexual activity. Most others (88%) reported adequate counselling on diet, medications, necessary follow up, activity limitations and the need for hobbies. The respondents did state that their educational instruction was sporadic in nature. The patients identified that it would be helpful to have continued reinforcement of the information throughout the rehabilitation process.

Newton & Killien (1988) undertook a longitudinal survey in order to examine the timing and content of knowledge requirements of patients and their spouses after CABG surgery. Patients were seen in person and also interviewed over the phone at one, six, 12 and 24 weeks after hospital discharge. The most common learning needs expressed in this group included information about complications, signs and symptoms of
complications, the need for learning CPR, stress management, and medications. Interestingly, at the one week interview, patients' spouses expressed the greater concern and need for additional information in the majority of the 12 learning areas listed by the researchers.

It is evident that general cardiac patients have learning needs which remain unmet at the time of hospital discharge. Additionally, it would appear that the cardiac patient's family also requires information pertaining to the individual's recovery. This might be due to patient education and counselling being undertaken when the patient's spouse is not present. It may also derive from the disparity in beliefs between what patients and hospital staff feel the patient needs to know.

Patients' and Nurses' Beliefs and Learning Needs

A study by Gerard and Peterson (1984) compared patients' and nurses' perceptions regarding the importance of specific learning needs relative to the cardiac illness. Thirty one patients and 36 nurses completed the survey. The patients identified risk factors as the most important learning category, whereas nurses believed medications to be most important. There was agreement on two priority topics: "what to do for chest pain" and "signs and symptoms of angina" (Gerard & Peterson, 1984).
Karlick and Yarcheski (1987) completed a partial replication of Gerard and Peterson's study. Thirty people who had a myocardial infarct were recruited along with 30 nurses. The sample population were given two forced response questionnaires asking them to rate the importance of various information (e.g., information around diet, activity, anatomy and physiology). Like Gerard and Peterson's study, nurses and patients both ranked learning about risk factors and their modification as most important. However, many other areas varied in importance to either the nurse or patient. Again, nurses ranked information about medications as very important, while patients did not. An interesting finding in the study was that patients expressed greater preference for physicians than nurses to give them the cardiac information. These results highlight the differing perspectives regarding what information should be contained in a post-operative educational program. This then lends credence to the idea that educational programs are not necessarily designed according to what patients feel they must know.

The studies previously noted asked questions of patients based on predetermined categories of information. Because participants were able to list a number of issues relevant to them that did not fit within these categories, it is obvious that further assessment of their needs is warranted. The incongruence between nursing assessed learning needs and
patient identified learning needs serves only to slow the educational process and make programs ineffective (Waitkoff & Imburgia, 1990). Ultimately the patient is negatively affected. Because of the aforementioned, it was important to use a study design which allowed participants learning needs to emerge from them, and not in response to predetermined categories of information.

**Telephone Follow Up and Learning Needs**

Several different studies have used a telephone calling system to follow up patient concerns after their hospital discharge. McKnight-Nicklin (1986) used a telephone call back system whereby patients who had been discharged from hospital after either a myocardial infarction or unspecified cardiac surgery could call the hospital and address their questions to the nurse coordinator. Over a four and a half month period, 217 calls were received from 207 patients with five to ten calls received on average per day. Forty percent of the calls were received in the first week and 70 percent within the first month. The greatest number of concerns and questions centred around the cardiopulmonary system (23%), medications (14%), gastrointestinal disorders (9.4%). The results indicated that patients continued to have multiple learning needs during the early convalescent period at home and that they were willing to use an alternative source to obtain the requisite knowledge for
Beckie (1989) investigated the impact of a supportive-educative telephone program for CABG patients on their levels of knowledge and anxiety. Seventy-four patients were enrolled in the study conducted during the first six weeks after the patient was discharged from hospital. Beckie concluded that higher levels of patient knowledge surrounding coronary artery disease, diet, self care, medications and physical activity were reported in patients who participated in the telephone counselling sessions. She also reported significantly lower anxiety in this same group of patients. Beckie concluded that attempting to provide patients with "all they need to know" in the short period of time between surgery and discharge is a futile exercise. She further stated that while teaching is necessary in the hospital setting, it should be focused more on the immediacy of the moment (what the patient feels is needed to be known today) and further teaching should be undertaken when the patient has been discharged from hospital. These conclusions are similar to those by Scalzi et al. (1980), and Steele and Ruzicki (1987).

Tack and Gilliss (1990) arranged a similar system whereby they telephoned patients at home, at one, two, three, four, six, and eight weeks after discharge. The purpose of their study was to intervene if necessary in order to facilitate early recovery at home. Seventy-five patient and care-giver
pairs were contacted (of which 29 patients had valve surgery). The teaching most required during the first four weeks included management of symptoms, coping with recovery, pain, sleep disturbances, fatigue, nutritional problems and orthostatic hypotension. After four and eight weeks, patients continued to complain of ineffective coping, pain and activity intolerance. The content areas encountered which required further elaboration were similar to the other studies reviewed. A conclusion can be drawn that follow up phone calls after hospital discharge are an effective way of repeating instructions, increasing knowledge and assisting with retention of information (Waitkoff & Imburgia, 1990). This is a positive first step in promoting behavioural and attitudinal changes.

Summary

Rankin (1990) stated that recovery from CABG and valve surgeries are similar. Both groups of patients are anxious, tired and require time to recover. However, the issues and learning needs in rehabilitation vary, for once a cardiac valve prosthesis is inserted into the myocardium, the potential for valve related morbidity is present for life (Finkelmeier et al. 1989).

It is evident from the review of the literature that much progress surrounding patient education has been made, but that more work is needed. As heart surgery has evolved, so too have
the needs of its recipients. Patients undergoing heart surgery encounter a variety of emotional responses from delirium to depression, as well as a multitude of learning needs and lifestyle adjustments. Developing effective patient educational programs will serve to assist the patient in the rehabilitative process. Unfortunately, the principles of adult learning have not always been applied to patient education programs developed to date and discrepancies remain between what nurses and patients feel is important to address in these programs. Assistance in addressing some of these deficits may be achieved via telephone follow up, but there are to date few such systems in North America. A conclusion that can be reached is that in-patient education is effective in promoting the goals of short term recovery, but may have limited effects when used to reach long-term goals requiring attitudinal and behavioural changes (Waitkoff & Imburgia, 1990).

The research reviewed has shown that patients generally believed their post-operative education was lacking in certain areas. It was hoped that a study designed to allow the individual patient's perspective and ideas to emerge, would assist in improving post-operative education. Ultimately, this study will add to the growing body of knowledge around chronic cardiac conditions by identifying these learning needs. Henderson stated that for patients to work toward and achieve independence, they must first possess the necessary strength,
will and knowledge (Henderson, 1991).
CHAPTER THREE

Methodology

This section describes the choice of design, processes of sample selection, data collection and analysis, and procedures for the protection of human rights for this study.

Research Design

A qualitative, descriptive research methodology was used for this study (LoBiondo-Wood & Haber, 1990). A review of the literature did not reveal any significant research pertaining to this subject area. Consequently it was necessary to choose a method which allowed full exploration of a subject about which little was known and a descriptive method is appropriate and effective when attempting to describe the unknown (Wilson, 1989). Specifically, this design allowed the participants to describe their post-operative learning needs between four and ten weeks after hospital discharge, when they arose, and how they felt these needs could best be addressed. Semi-structured interviews were conducted and the data collected were analyzed using latent and manifest content analysis (Field & Morse, 1985).

The Sample

A convenience sample of 18 participants were recruited for
the study. Other types of sampling, such as a probability sampling were not practical due to the limited number of valve replacement surgeries done per month at the local teaching hospital, coupled with the large catchment area from which the participants were drawn.

**Participant Selection**

Patients fulfilling the following selection criteria were deemed eligible for participation in the study:

1. Participants were 25 years and older;
2. Participants were able to communicate in the English language;
3. Participants were able to provide informed consent for participation in the study;
4. Participants were undergoing their first heart valve replacement surgery;
5. Surgery had to consist of a replacement of either a mitral, tricuspid, pulmonary or aortic valve, or a combination of these;
6. Participants were residents of the Vancouver, British Columbia area and had been treated at the local teaching hospital;
7. Participants were four to ten weeks post-hospitalization at the time of the interview.
Participant Recruitment

The sample population were recruited from one local teaching hospital. One thousand and forty patients had heart surgery of all types at this hospital in 1994. An information letter outlining the purposes of the study was provided to the hospital's seven heart surgeons (see Appendix D). All the surgeons gave their consent to their patients being approached for study participation.

Patients were recruited from the ward before discharge, or at their surgeon's office at the time of their six week follow up visit. Potential participants were approached by an intermediary, either the physician's office assistant when subject recruitment occurred in the surgeon's office, or the assistant head nurse on the cardiac surgery recovery ward within the hospital. Intermediaries were provided with a red folder containing an explanation of the study, inclusion criteria, and a statement to read to potential participants (see Appendix E). Additionally, a handout including a description of the study, its purposes, the commitment of the participant and how the study was to be carried out, was included to provide to participants when approached (see Appendix A).

All known persons fitting the criteria for the study were approached until the appropriate number of participants (18) was obtained. Two potential candidates refused to participate
in the study for unknown reasons. A third was asked but developed complications requiring re-hospitalization which excluded him from the study. When patients chose to participate, they recorded their names and phone numbers on a sheet of paper attached to the letter of information. This was remitted to the intermediary (Appendix A) and forwarded to the researcher, who contacted the potential participant by telephone to set up an appointment for an interview and to obtain written consent (Appendix B).

Human Rights and Ethical Considerations

In order to protect human rights and privileges, the study complied with, and was approved by, the University of British Columbia Behavioural Sciences Screening Committee. Ethical approval from the Research Committee of the Medical Advisory Committee at the teaching hospital used was also obtained. Participants were assured of confidentiality and informed of their right to refuse to participate without untoward effects. Those agreeing to participate were given a copy of the consent form.

Because the interviews were audio taped, participants were informed that portions of the data were to be shared with the researcher's supervisors and that all tapes would then be erased. Participants were informed that they could have parts of the taped interview erased, or that the tape machine be
turned off at any point during the interview. Two requests were received for portions of the tape not to be used, and these requests were adhered to.

When questions arose during the interview which were related to the individual's health care, the researcher informed the patient of the appropriate resources for follow up (eg. Heart and Lung Association for smoking cessation).

Data Collection and Analysis

The participants were interviewed for approximately one hour. A Learning Needs Interview Guide (see Appendix C) was prepared by the researcher which assisted with the data collection during the semi-structured interviews. Field notes were recorded after each interview. These consisted of observations made during the interview (eg. the state of cleanliness of the home). The potential for follow up interviews was discussed with each patient however a lack of clarity in the discussion of a subject area was found in only one interview, and this participant was contacted and the issue clarified.

Learning Needs Interview Guide

The interview guide was designed to provide some direction to the interviews. Henderson's (1991) fourteen needs were used as a guide when developing the question prompts. The questions
were designed to be flexible, open-ended and non-threatening. Flexibility within the interview format "can bring out much useful material because it allows the researcher to... elicit the subjects' values, beliefs and attitudes" (Brink and Wood, 1983, p.116). Semi-structured interviews were the preferred method of interviewing because the researcher was unable to anticipate all the possible responses to issues or questions (Morse, 1992). The interview guide also assisted in ensuring that all participants were asked the same questions. It seemed that this interview method allowed study participants to talk freely about their post-operative learning needs. The interview guide was designed based on the assumption that the participants would have received the usual heart valve replacement discharge teaching offered by the staff of the hospital where the surgery was performed.

Specific demographic information was asked of each participant at the end of the interview including: age, sex, type of valve implanted (porcine or mechanical), educational background, and the dates of surgery and discharge. Because participation in the study was limited, the demographic information obtained provided general information only and was not used for statistical analysis purposes. Age was noted because Grady et al. (1988) have indicated that younger people perceive less of a need for post-operative education than older people. Consequently, it was felt that it would be interesting
to see weather this trend would be observed in this study.
Rankin (1990) and MacKenzie (1993) established that learning needs varied between men and women, so recording patient gender assisted in identifying learning needs specific to men or women. There was not a large enough sample for this to be statistically significant. The type of valve was relevant because those with mechanical valves experience different treatment regimens. Educational background was significant because Dodge (1969) and Grady et al. (1988) demonstrated a link between degree of understanding and level of education. Hence this was also documented and considered during the analysis of the results. The date of the participant's surgery and discharge was required to ensure patient interviews were being conducted four to ten weeks after hospital discharge.

At the conclusion of the study, the participants were offered the opportunity to provide any other information they believed would be beneficial. The participants were informed that a summary of the results could be obtained at the conclusion of the study. All 18 participants requested a copy of this summary.

Data Analysis

The interviews were audio-taped and transcribed. Patients' learning needs were related through the telling of their whole experiences. Consequently, latent and manifest
content analysis was used when analyzing the data (Field & Morse, 1985). The various passages of the text were reviewed within the context of "the entire interview, in order to identify and code the major thrust or intent of the section and the significant meanings within the passage" (Field & Morse, 1985, p.103). Several interviews were repeatedly re-read during the coding and analysis process to assist in identifying the commonly emerging themes. The data from the interviews were also compared with one another by sorting into categories to identify commonly recurring themes and learning needs. Through the analysis of the underlying meanings and overall intent, a description of the participants and their learning needs emerged.

**Validity and Reliability**

The Learning Needs Interview Guide was reviewed by a cardiac Clinical Nurse Specialist prior to its use and several small wording changes were made. To further assist in addressing content validity, a pilot study involving two patients was conducted. The criteria and procedures for sample recruitment and data collection were used during the pilot study. Conducting the pilot study assisted in increasing the clarity of the instrument designed, as it demonstrated the guide's effectiveness in eliciting responses pertinent to the research questions. Date of hospital discharge was the only
addition made at this time.

Intra-rater reliability in the coding process was assured by having the researcher transcribe and code all the data (Downe-Wamboldt, 1992). The researcher also re-coded the first interview after having coded 10 other data sets to ensure the same themes emerged both times. There were no major discrepancies noted in the coding when the 2 transcripts were compared.

Summary

This study uses a descriptive methodology. An interview guide based on Henderson's needs was designed, refined and used during patient interviews. The study adhered to the regulations for protection of human rights and patient confidentiality of the University of British Columbia's Behavioural Sciences Screening Committee. The data from the interviews was coded and analyzed using latent and manifest content analysis in order to establish the common learning needs of heart valve replacement patients.
CHAPTER FOUR

Findings

Chapter four presents the findings of the study in four sections. In Section One: Participant characteristics are initially presented. Section Two: The Pre-Operative Process presents the pre-operative learning needs expressed. Section Three: Post-Operative Experiences outlines the learning needs expressed during recovery. Section four: Addressing Learning Needs, presents the results pertaining to when the needs arose. It also addresses "who" (according to the participants) should undertake this task, when the instruction should take place, and how it should be undertaken. A thorough discussion of the results is presented after each theme in each section.

Section One: Participant Characteristics

A total of 18 participants, (nine men and nine women), were recruited for the study. This correlated with the previously noted statistics from Statistics Canada which revealed that approximately equal numbers of men and women undergo first time valve surgery each year in British Columbia. Five participants were recruited from the hospital ward. The remaining 13 were enrolled through the surgeons' offices. Eight men were married and one had never married. Five women were married, three were widowed and one had never married.
Ethnic origin varied with participants being Chinese (3), British (2), Russian (1), Italian (1), Scottish (1), Irish (1), and Canadian (9).

Male ages ranged from 29 to 79 years, while female ages ranged from 32 to 76 years. Thirty three percent of the sample, were between 66 and 75 years (see Table I, Appendix F). Ford's (1989) study reported that the largest percentage of her Canadian sample group (26.4% of valve patients) were also in this age range.

Education levels were relatively homogeneous. A comparison of the male-female sample revealed that five (two females and three males) had less than a grade eight education, six (three men and three women) had achieved grades nine through twelve, and seven (four women and three men) had college or university degrees. (Levels of education achieved are presented in Table III, Appendix F).

Occupational characteristics revealed that the majority (n=10) were retired. This correlated with the majority age range of participants. Of the remaining eight, two men and two women were on sick leave from their place of employment, two men were attempting to begin new careers, one woman had been on long term sick benefits for more than five years, and one woman was a home maker with a six month old child.

The aortic valve was the most commonly replaced valve (see Table two, Appendix F). Of the 18, five had porcine prosthetic
implants, 12 had mechanical valves and one had an "experimental" mosaic valve. Thirteen participants required anticoagulants.

Participants spent an average of 9.5 days in hospital recovering from surgery (not inclusive of the day of surgery). Men had a mean hospital stay of 8.2 days, while women spent an average of 10.7 days in hospital. Hospital day utilization varied from seven (mode) to 19 days. This proved similar to the recent provincial and national statistics reported by Statistics Canada.

Four people did not participate in parts of the routine teaching programs, implemented by the hospital. Two chose not to see the pre-operative instructional video, fearing that it would have been too graphic, but underwent the routine tests and interviews on admission. Two participants did not see the video entitled "Going Home after Heart Surgery". Both stated they would have liked to have seen it, but it was not offered to them. They did, however, participate in physiotherapy and nutrition classes.

Interviews were conducted in the participants homes between 28 and 76 days after hospital discharge. (The average was 54 days). The visits lasted from 50 minutes to one hour and fifteen minutes.

Section Two: The Pre-Operative Process

The Stories
The participants were an eager group, with seven disclosing information pertaining to their experiences prior to the researcher introducing the study or having the tape machine turned on. Despite specifically being asked about learning needs encountered after the surgical experience, all participants described their "stories" from the onset (long-term illnesses or sudden crisis), through the process of diagnosis, surgery, as well as their post-operative experiences.

The story telling proved significant, because the stories and how they were expressed provided insight into the participants experiences and their learning needs. Most participants initially visited their family physician due to illness related physical limitations. These included shortness of breath, lack of energy, difficulty walking, dizziness, and fluid retention. Three participants were originally wrongly diagnosed with the flu, pneumonia and a cold. Those who underwent emergency surgery had previously seen their family physicians for colds, shortness of breath and general malaise.

Eight participants discussed having the pre-operative angiogram and its effects. Two developed complications as a result of the procedure. One participant lost part of the vision in his left eye, while the other developed peripheral nerve damage, resulting in a mild limp and disequilibrium. Both stated they were not informed of these potential
complications and expressed anger that this had occurred. The other 6 participants simply mentioned the angiogram as part of the diagnostic process and deemed it “an interesting procedure”.

**Choices: Surgery and Valves**

While recounting their stories, it became evident that the participants perceived they had little or no choice when making the decision to have the defective valve(s) surgically replaced:

My doctor had me go to the cardiologist and between them they decided that surgery was necessary. It was not a question of making a decision, they said it just had to be.

I wanted to decide whether or not I really wanted to have this done. Then when I got short of breath and wound up in intensive care, I more or less had no choice. I wasn't really decided, but...

Fifteen participants expressed similar concerns. Of these, the six participants who underwent emergency procedures (with little or no prior knowledge of their heart valve defect) were particularly vocal about their perceived lack of choice pertaining to the surgical intervention:

... the surgeon said, I think we're going to do it right now, if you don't have any objections. I said "No, I guess not, I'm not doing anything this afternoon!" But I was really quite unsure, I didn't know much of anything!

And they indicated to me that if I refused the surgery I wouldn't be here much longer... So the choice was already made.
The choice of valve implants was verbalized by all participants as an important though stressful part of the process. Fifteen participants stated that it was difficult to make a decision pertaining to the valve type. Age was not a determining factor. One 75 year old man commented:

We thought about it a lot and well... the mosaic, ugh, my wife, she figures this is sort of new and experimental, and since the porcine are pretty well accepted, we took that one.

Eleven participants felt well informed by their surgeons and various physicians about the types of valves and the adaptations required for both.

They showed me videos and they showed me mechanical valves, the pig valve, the whole works. I seen it all months prior to having the surgery. I decided I would rather have the mechanical one.

...and the ramifications were very well explained. If I had the pig valve I was going to be looking for truffles in the forest (laugh). It was strongly recommended that I take it (mechanical valve) but the downside is that I am stuck on rat poison for the rest of my life.

The remaining seven felt that more pre-operative education in the form of specific written information was required in order to help with their decision.

I expected to be more informed, actually. There was not a lot of education ahead of time.

They should give you more information before the surgery...

You're with your doctor... you're sitting there and your stomach is going and you don't know what you're doing really. You know you're there, you know you're going to go for it and everything like that, you're quite set, but you get out of there and all of a sudden you think, now did he tell me this or that? A pamphlet on this valve stuff
would be good.

The importance attached to the choice of valve was best seen with C, a 32 year old women who was 28 weeks pregnant at the time of her acute valve failure. Initially, she wanted to have at least one more child, therefore she perceived her choice of valves as being both important, and difficult. Prior to her caesarean section, she was considering a porcine valve, which would have allowed her to attempt a repeat pregnancy. However, after what she described as intensive pre-operative teaching pertaining to the various valves, and the successful birth of a premature, but healthy baby girl, she opted for sterilization and replacement of her defective valve with a mechanical one. She did not want to risk her life by having to repeat the surgery in 10 to 15 years.

Three individuals stated that they were uncertain as to what type of valve was implanted. With one woman, this was discovered during the interview when the researcher asked if she could hear the valve click, and she wondered why anyone would ask such a silly question! The second person volunteered this information, "I didn't even know until afterwards what kind of valve I had!" During another interview, a participant was asked what type of valve he was given and replied "beats me". Interestingly, all three were educated with at least a high school diploma. These individuals had waited greater than two months for the surgery. Consequently, it was evident that
even when time permitted, not all participants were well informed. Obviously, these three participants did not discuss the difficulties encountered with valve choices. This further supports the participants' claims that they did not always have a choice in, and were not always informed about various aspects of the procedures. It is possible that information was provided but not retained due to the stressful nature of cardiac surgery.

Despite statements indicating they felt well prepared for the surgical procedure, many of the participants attempted to find additional information related to open heart surgery and the valves. For some this was not possible due to the emergency nature of their surgery. However, four participants discussed the procedure pre-operatively with friends, acquaintances, or their pharmacists. Nine participants undertook their own reading or research.

I have this article here on the mosaics, from the paper. They make them right in Burnaby here.

They have a library in reception at children's hospital and I'd go in there and I'd read on heart conditions and valve replacements and stuff like that.

These individuals searched libraries (most frequently), pharmacies, home medical texts and the Pritchett and Hull series of cartoon books on *Going for Heart Surgery*. Two individuals had difficulty finding written information that was easy to read, with one even searching the medical equipment rental shops. Both commented:
They should have pamphlets in the specialists offices. You go in there and you see magazines, you don't see information regarding patient information. ... they are specialists in hearts so they should have all sorts of heart information.

Four participants asked their doctors many questions and persisted until they were satisfied they had the answers and information they were seeking. This study did not seek to evaluate the perceived adequacy of pre-operative instruction and preparation, but seven participants openly stated that it was inadequate.

Discussion

Stanton et al. (1984), and Grady et al. (1988) have previously documented patient surprise as it pertains to being diagnosed with heart disease. The surprise experienced in this study may have been an expression of denial or perceived lack of control and injustice at having to "choose" to undergo such an operation. Regardless, it can be concluded that greater than one third of the participants were not adequately informed about the various valves, the surgery and its complications at a level which they could easily understand, or which enabled them to "choose" to have the operation. In addition, it is clear that the stressful nature of the process caused poor information retention for some. Because of this, the issue of informed consent requires consideration. If written information were available in a tangible form from all the surgeons' offices, the participants may have perceived
themselves to be better informed, and may have made choices which more fully reflect their own beliefs and "unique" situations.

**Emotions**

A variety of emotions were experienced during the pre-operative process. All the participants made strong statements to indicate that their individual process was unique and not generally applicable to all cardiac patients.

Everybody you talk to that has had surgery, regardless of what it is, ... they are entirely different. I figure anything that is done to the body, no two people are the same.

I think this is a highly sensitive and individual topic and, ugh, you will find that the responses are very individualized.

Anxiety and fear were described by 12 participants as commonly occurring pre-operative emotions. The participants used descriptions such as scared, worried, stunned and shocked. Statements such as "I was scared straight!" or "I had a fear ugh, maybe of death I dunno, but it was big time!" were common. One person voiced fear and concern about the potential of having a resident do his surgery because a resident had performed his angiogram, which resulted in partial blindness.

Thirteen participants identified the pre-operative waiting time as stressful. Eight participants believed that their condition deteriorated during this time. This feeling promoted a sense of urgency within, and added to their perceived stress
levels. One person commented "I was bumped three times... and I could feel myself getting worse every day!" The participants waited up to three months for their surgery and were bumped as many as three times, but still commented that they were in hospital for surgery quicker than anticipated.

I wasn't expecting that, because on the news there were delays because of the funding of the surgeries. And that they were only doing major surgeries to the people that had major problems first. So I wasn't expecting it so soon.

Two of the previous statements mention death. The fear of death was verbalized by six participants as being a genuine concern. One person even asked "Are you sure I am going to be able to be brought back to life after?"

Eight participants verbalized various forms of denial between the time of diagnosis and surgery.

I felt that was wrong, me having any valve problems! I didn't feel anything. I guess I just didn't want to go through this.

I don't think it really clicked in for me that it was me. I think I went through the whole thing, ugh, on the outside looking in.

One man said that as his case was not considered urgent or life threatening, he thought it was not going to be much of a problem. He later decided that this was a denial of the severity of the illness. Shock was an additional emotion expressed, closely paralleling denial.

A lot of things didn't register. I think I was in more shock than anything else. But it is still a little bit of a jolt to my system that I have a heart condition, and it's not going to go away.
Anger was also evident pre-operatively. Although not universal, it was prominent in those who had been misdiagnosed and those with residual effects from the angiogram.

Five participants, both young and old, commented on the need to prepare themselves and their families for the surgical process. Preparations included purchasing an answering machine thereby ensuring the opportunity to "get in" for surgery, packing one's travel bag "just in case", preparing wills, paying all bills and settling debts.

A variety of emotions were described in relation to the hospital admission. Two participants stated that they felt panicky once in hospital, because this meant they were going through with the surgery. The eight participants who expressed denial continued doing so, stating that they thought it would be "a piece of cake, easy, a cinch, minor surgery...". These individuals later commented that they had false perceptions of the process. "I was not quite rational, in terms of what I was expecting...". Two individuals maintained that the hospital admission was easy. Generally, the group had a very positive attitude toward the surgery and recovery. One woman commented "I was happy to go and have it, because it was getting unbearable..." Another woman stated "the surgeon is going to do his part and then I've got to do mine". The participants wanted to have the surgery, go home, be with their families and recover.
Two participants stated that they were fearful of, and chose not to view the pre-operative video, believing it would provide them with greater information related to the surgery than they either wanted or perceived necessary. One women, a senior vice-principal at an elementary school commented:

I thought it might be like some of the medical things on TV where you're getting more education than you really need. It probably needs to be explained to someone like myself who would refuse because of the thought of the blood and gore.

When asked if they were informed as to the content of the video, both participants replied no. When told what the video did contain (information related to who you will meet, and the general procedures performed prior to heart surgery) both participants said that had they known this, they would have been willing to view the tape. They commented that this should have been made clear to them pre-operatively.

Discussion

The pre-operative emotional responses varied but as noted, anxiety, fear, the fear of death, shock and anger were commonly reported. These emotions have also been reported in much of the past and current research literature. While many of the emotions expressed were common to more than one person, the participants clearly stated that they perceived theirs to be unique. Interestingly, the need to tell one's story and the perception that it is unique have also been commonly reported
in the literature.

Being "bumped" from the waiting list placed undue stress and worry on people who were already very ill. One may look to the news media for a partial explanation for the waiting time stress. The media report on surgical waiting lists without necessarily presenting the entire picture. Unbalanced coverage exacerbates patients pre-op anxieties.

Section Three: Post-Operative Experiences

Discharge Process

Eight participants voiced concerns with the perceived lack of assistance and organization in the discharge process. Five stated that they were discharged too soon, that they remained unwell, and were not given proper notice to make suitable travel or domestic arrangements.

...the specialist, he told me you have to go home. I say NO!, I cannot go home cause I not feel good. "No" said the specialist, "You have to go because you are OK." But I no feel OK!

Three people voiced their concerns pertaining the lack of assistance provided when leaving the hospital. One, a retired surgeon, stated:

Going home, hum, you get a lot of attention when you're coming, but when you're leaving you more or less are told OK, go home! No fanfare what so ever! They didn't offer you a wheelchair, nothing. My wife and daughter were there. We had to go down and get my valuables and look after the bill for the room and then do something about a car. But I thought, no help!

Discussion
The process of physically leaving the hospital requires further consideration. It is possible that hospital discharge is a psychological milestone which some patients look forward to, and wish to celebrate. However, other patients (and their families) may truly not be physically or mentally prepared. This may be the result of the trend toward funding related, early hospital discharge. Seeing only one of the participants was rehospitalized after discharge, it is reasonable to speculate that this is an issue pertaining to psychological adaptation and not an issue related to physical preparedness.

**Fatigue and Weakness**

The most prominent theme described by all participants was one of incredible fatigue and its resulting weakness. This was described as both unexpected and discouraging.

I was a walking dead man.

I thought I would be hot to trot by Christmas... but I didn't realize I would be quite so tired... I was dismayed.

The weakness experienced by the participants was best expressed by two different women who stated:

Things I would just take for granted that are so easy, were so hard. Like these vials that I opened a million times a day, well I could not get into them. I couldn't get into my pills!

I even found a couple of weeks after I was home to even peel a potato was a big effort and I had to put the knife down and look at it. I thought this is ridiculous. But your muscles are just like jelly.

Only one women stated that she was informed about the potential
for post-operative fatigue while in hospital. With one exception, participants stated that fatigue and weakness were exacerbated by post-operative sleep disturbances. Sleep patterns were disturbed by coughing, pain and the need to void during the night, "I had diuretics for congestion, and that means a trip or two to the biffy through the night, regularly". While all had been prescribed sleeping pills, five reported not using any. Three of these were because of allergies and previous reactions to sleeping medications, while two felt they could simply do without them. All 18 participants denied being provided with information related to rest and sleep promotion. They were simply given the sleeping pills as part of a larger prescription by their physicians and instructed to take the pills as needed. Three participants voiced concerns regarding addiction to the pills and would have liked this issue clarified.

The resulting weakness and fatigue made it difficult for participants to perform their usual daily activities. They had trouble with, and needed information related to performing activities such as dressing, bathing, brushing teeth, and shaving. Men and women both commented on how difficult it was to put on socks and shoes, because this required a bending and pulling motion, which was uncomfortable due to the pressure it placed on the incision. Women added nylons, stockings, and the need for a bra (depending on their breast size) to the list.
I have never been envious of small breasted women in my life (laugh), but with the surgery between the breasts, I think ugh, chesty women should be advised to bring something to sleep in, in the way of a soft sided bra of some sort. That allowed me to move in bed with some degree of comfort.

Four participants reported that once home, they immediately showered or bathed because they had not been allowed to do so in hospital. Nine participants reported not being provided with information pertaining to bathing which resulted in four participants getting stuck in the bathtub.

The first day I took a bath, big mistake! I couldn't get out! My hands were strong but my arms were so weak. I didn't know.

Four people reported difficulty with teeth brushing and shaving because this required too much effort.

The first five days after the operation I didn't brush my teeth or shave. It was hard. It would take you half an hour. You have to bring in the chair to sit down.

Discussion.

The most commonly discussed impact associated with the surgical event was a physical one. Fatigue has been reported as common in a variety of other studies with CABG patients (Newton & Killien, 1988; Wingate, 1987). Fatigue was in itself, an important contributing factor to the many needs expressed. Consequently participants expressed a need to be better informed about the nature and extent of the expected fatigue and weakness encountered, so that when these were experienced, they would be perceived as a natural part of recovery. This may in turn reduce some of the disillusion
experienced post-operatively.

Sleep pattern disturbances contributed to fatigue. This is also a commonly reported problem in the early post-operative days and in the literature. Refusing to use sleeping medication contributed to slowed recovery for many participants and resulted in prolonged fatigue and weakness.

Troubles with, and the need for information related to such activities as dressing, bathing, brushing teeth, shaving and putting on shoes have also been reported in the literature. Moynihan (1984) found that participants focused on the need for more information related to their daily activities during recovery. She concluded that "patients expressed a need to have instructions on items which would facilitate their resumption of a normal lifestyle". It is recognized that the difficulties experienced here were in part related to fatigue, but it would seem that motivation and independence also contributed to explaining the "recovery" from fatigue. The few who did not want their families to see them looking unwell and helpless reported making additional efforts to wash and clean themselves independently. The increased effort naturally resulted in greater fatigue. However, this same group placed less emphasis on their various needs in this area.

Accomplishment of everyday tasks such as dressing encouraged them to undertake other activities earlier in the recovery process. Although speculative, a positive correlation between
accomplishment of activities and the confidence to try new ones has been reported in the cardiac literature by Hertanu, Davis, Focseneanu, & Lahman (1986).

The specific need to wear a bra, depending on chest size has not been previously reported. The use of a bra or support may provide comfort, and help reduce the problems associated with sternal wound dehiscence, which leads to infections and delayed healing. This also supports Mackenzie’s (1993) research which suggested that women have different learning needs, some of which have yet to be discovered.

While specific information related to bathing is in the video, it does not seem to be "retained" by the participants. It is possible to speculate that participants should be encouraged to bathe while in hospital. If they did, they might not feel the need to rush home and bathe. They would also encounter any potential problems with bathing while in the safety of the hospital environment where there are qualified nursing staff to assist them if needed.

Mobility

Difficulty with mobilizing was the second most prevalent theme expressed by the participants. This was due to the sternal incision, generalized pain, and the perception of sternal instability, as well as general weakness and fatigue. In describing her chest instability, one person said "You feel
like you are not together somehow you know. You feel like you are cracked!" To cope with this, the participants stated that they simply listened and responded to their bodies.

You got to slow down, you have to. It will stop you anyway. You can only do so much and it will stop you!

I recognize enough of my own capabilities to know that I have walked enough, I have done enough, I don't push myself beyond that. I do not do things I cannot do easily. The physical limitation are quite definitely there and my body tells me.

Inability to mobilize resulted in trouble getting in and out of bed, chairs and cars, as well as reaching, lifting, turning, pulling, pushing, cleaning and driving. Many of these troubles were deemed general "hassles" because they impeded every day activities such as cooking and doing laundry. Participants stated that they were told little about the actual difficulties associated with moving. However the participants did report being well informed about how to get in and out of bed. Their retention and understanding of this information was well described.

In hospital, they have like a rope hooked onto the bed frame. I made one out of electrical cord. You have to have that to pull yourself up. It's much easier, a 100 times easier.

We tied together a couple of neck ties! My wife used all the horrible neck ties I own!

The participants stated they were well informed about lifting, noting that they were not to lift anything over ten pounds.

I am very careful about that. I do iron. I actually weighed the iron and it is not ten pounds, so (laugh).
While not specifically told about the troubles encountered with reaching, pushing or pulling, they were able to discern these for themselves, by listening to their bodies.

Something would be two inches away from your face but it was also two inches higher than you were suppose to reach and you know if you reached that high, it's going to hurt.

Further evidence to suggest that participants judged their own capabilities by listening and responding to their bodies was seen when the participants discussed driving. Despite a statement in the yellow booklet not to drive for one month after the surgery, two participants opted to drive shortly after their release from hospital.

Seems to me that there was something in this book about driving after surgery, but ugh, I think it was left up to me. I drove almost immediately... I felt comfortable doing it, and so I wasn't really worried.

Eight participants chose to wait longer than the prescribed 4 week limit.

I started driving this week which is wonderful... It's given me a real boost. I waited a little longer for the driving, cause I felt I wouldn't be so good at it, and I wanted to be sure...

The younger participants drove on or around the recommended dates, while the older participants waited a little longer.

Generally, the participants were told by their physicians to "take it easy" for the first while after the surgery. One person aptly stated "They did say take it easy, but that doesn't mean anything!" Participants both young and old were able to describe one or more incidents in which they "overdid
it”. These reported acts were routine activities and occurred "by accident.” Regardless of how it happened, the activity undertaken resulted in pain and discomfort.

You are so used to a routine around the house, you sort of forget... the next thing you know you grab the vacuum cleaner and you pick up the end of a bench and you know, then you pay for it later.

However, most of the participants expressed the need to be very careful, with twelve relating a story about the fear of injuring themselves by overdoing it.

I was told of a person who overdid it and broke the wires and had to go in and have himself cut open and re-wired... and that was a lot worse than the surgery.... OK, I won't lift that I said to myself.

This story was mentioned repeatedly to the researcher. The assistant head nurse on the Cardiac Surgery ward confirmed that a patient had been re-admitted on two separate occasions for sternal re-wiring after his incision dehisced at home. This explained why so many of the participants knew about this particular incident, and may have contributed to the care undertaken when lifting.

Discussion

Issues related to mobilizing have been widely reported in the post-operative cardiac literature. It would seem that while the participants expressed concern with mobilizing and the limited information received pertaining to this, they were able to adapt quickly, most probably because of the "perceived
need" to do so. Many referred to "listening to their bodies", as the simplest way to accomplish anything. The fact that participants were able to "listen and learn" from attempting activities such as lifting, pulling, driving, and other daily activities suggests that they learned and retained the information best by undertaking an action or activity which told their bodies "this feels ok", or "it doesn't". This also holds true for other areas. The participants were able to state that they needed a rope at the end of the bed, because it facilitated the mobilizing process. Upon discharge, participants were often told to "take it easy". Perhaps being told to "listen to your body" would be a more meaningful generalized comment.

Resumption of Activities

Due to their limited mobility, several participants stated they needed to modify their routines or home environment to make their daily activities easier to undertake.

This is why I am doing everything at the kitchen sink, it is higher and I can rest my elbows (laugh).

Two individuals added sit down, non-slip shower seats to their baths while another added a non slip mat.

Fatigue, weakness and lack of mobility dictated a gradual resumption of activity for all participants. Young participants tended to resume various activities such as
walking greater distances and household work, sooner. Over time, all the participants gradually resumed their various roles and work related activities. The ten participants who were seen at the latter end of the study related significant increases in their routine activities. Single women undertook more activities sooner than married women or men. Married women resumed what they deemed their role related activities sooner than men. All ten participants admitted to continuing difficulties with the resumption of their activities, despite wanting to do more.

In the kitchen, I just a cook a little bit and my husband wash the dishes because if I cook, I cannot do dishes no more because I still feel very very weak.

The first thing I wanted to do was start cleaning my house because a husband and children don't do things the same way a woman does. And I still can't clean my house the same way I normally did before, and it really bothers me a lot.

The participants described their activity resumption from the in-hospital, early post-operative period, beginning with physiotherapy. The physiotherapy classes were perceived as good by 11 of them. Three participants thought the classes were "not great" or of little benefit to them. The remaining four stated that the classes were conducted too soon, not necessarily for themselves, but for others. This in turn slowed the rest of the class and reduced its potential benefit.

There was such an age range and physical capability and mental ability with some who were not really with it, so that I don't think the physiotherapist made the best use of his time.
The participants perceived the take home exercise handouts as good first exercises because they "get you going". Several participants reported doing these exercises regularly, even with friends and spouses. When asked about his activity level, one man responded, "Well not as much as I should, but my wife goes to the gym!" Four participants admitted to not resuming or attempting to perform the level of activity "prescribed". Two people admitted that as the patient, they had over-protected themselves.

They encourage you to exercise... but running out and sucking cold air into these tender lungs wasn't the greatest thing in the world!

While describing their activity levels, 12 participants stated that their shortness of breath was or had resolved, and that they were now walking up slopes and hills with increasing ease. This was significant, because it was the most common symptom that had motivated them to seek medical attention. Consequently, they perceived their health as improving.

Six participants expressed a desire for more information related to exercise in order to regain their pre-illness levels of fitness, energy and stamina. This request was made from both men and women, independent of the number of weeks after their surgery or their age. Some participants were more motivated to actively participate in the recovery process than others.

Discussion
MacKenzie (1993), also reported that women engage in various activities sooner than men. The reasons for this are speculative, but are thought to be linked to gender roles. Further investigation pertaining to gender differences and recovery continue.

Overall, the exercises were perceived as being adequate beginning exercises. Previously published research has suggested that patients are often reluctant to resume or engage in post-operative exercise programs (Allen, 1990; Certo, 1985; Stovsky & Dehner, 1994). While there was evidence of this, it was encouraging to note that one third of the participants actually requested additional information pertaining to exercises they could undertake at home while convalescing. This may be partially explained by the resolving shortness of breath and the perception of improved health. This result supports Wengers' (1986) assertion that patients with valve replacements can, and want to, safely participate in low level exercises after hospital discharge.

Resumption of Sexual Activity

Ten participants stated that their level of sexual activity was affected during the early weeks of recovery. This was particularly significant for the younger participants who perceived that it placed additional stress on their family support person and personal contact that they shared.

I had a hard time with ugh, not being able to have the
contact that wives and husbands normally have with each other. That's one of the biggest problems I had. But we're past that stage now. It bothered him and it bothered me, because he was quite worried you know, once we get going he would hurt me. Because we do get active like normal people.... It's like Dr.' Z recommended, just be careful not to use your arms and you know, like get carried away sort of thing.

Only three participants stated that they had discussed sexual activity with their surgeons. Ten participants stated that they simply tried to engage in sexual activity when and if, they felt ready to do so.

They gave me to February 4th before... but hey, I'm human. I basically set out and ugh, discovered what I could and couldn't do... You do you're own thing, regardless of what you're told.

Four participants stated that sex was no longer an issue for them and as such they did not require information about this, nor were they provided with any.

No, I had a radical prostate done eight or nine years ago for cancer of the prostate and ugh, I have been pretty well impotent ever since... But they wouldn't of known that I had had a radical prostate or that I was impotent, so they just didn't talk to me about that [sex].

The participants were able to state that they had noted the recommended date for resumption of sexual activity in the yellow discharge book. In addition, four participants stated that it was mentioned in passing, in the discharge video. Three participants added that they had read about it in other sources. One 58 year old woman commented:

The literature says if you can climb two flights of stairs
you can resume sexual activity, even though I am single, I must admit I checked out when I could do two flights of stairs!

The majority of participants stated they wanted more information pertaining to the resumption of sexual activity prior to hospital discharge. However, despite lacking the requisite information pertaining to the resumption of sexual activity, the participants proceeded when they deemed themselves ready to do so.

Discussion

The resumption of sexual activity, despite being well reported in the literature as a concern, remained a topic poorly discussed between the patient and the physician or nurse. Despite being discussed in the video and discharge booklet, more information was desired. Nonetheless, the participants were able to "listen to the body" and resumed intimate activity at a time when they felt most comfortable. Due to this, health care professionals may question if sexual activity needs to be openly discussed with patients. The participants responses to the question indicate that it should be. The fact that information was provided, but the participants still felt inadequately prepared, suggests that in-hospital patient education programs may not be able to provide the "complete solution" to the questions encountered during the early weeks of rehabilitation. This author suggests, as did Stanton et al. (1984) that patients require
post-hospital follow up and reinforcement of their learning.

**Pain and Medications**

A thorough understanding of the perceived levels of pain and its management are important because it was reported that pain deterred sleep and inhibited activities. Pain was described as well managed in only five individuals, "You know, you cut yourself and you feel pain. I had practically no pain." Sternal incisions were described as sore, tender and quite uncomfortable (moderate pain) by six individuals. These individuals verbalized some knowledge pertaining to pain control and treatment with their pain relieving medications.

I don't take it unless I need it, and they said it was better to have it and not be in pain, so that suits me fine.

The remaining seven described their pain as intense, tremendous, and incredible (severe). Three Asian participants (two men and one woman) who were younger than fifty five, were most expressive and descriptive about their uncontrolled, long lasting pain.

It hurts, even to pull the door open is hard. It hurts every time you, every time you move, it hurts so darned much!

They should have given me more drugs, more drugs. They should have given all of us more drugs.

Of the seven who reported high levels of perceived pain, only one had been provided with information in hospital pertaining to the use of pain relieving medication. This had been provided by the surgeon, but only after he suffered through a
reaction to codeine. In total, five participants reported having been provided with specific information related to pain management and the use of pain medications. Even one participant who was a health care provider stated:

It's kind of confusing about pain medication. They should have explained it better I think. You know, some kind of a guideline. I know everybody is different but it's so important...

Five older participants discussed referred pain and discomfort in their shoulders, backs and outer chest walls. Since these areas are not directly in line with the sternal incisions, three of them were unsure if their aches were related to the surgery. A discussion related to pain and pain management would have been of benefit to these participants.

When discussing pain and the medications to treat it, other medications were also mentioned. Of the 13 who were taking an anticoagulant (warfarin or coumadin), seven participants stated that they were not given enough or any information pertaining to the drug and its use.

They didn't explain a whole lot. They assumed I already knew because I was a pharmacist... but there was a lot of specifics I didn't know...

Of the seven, six commented that more information would have been helpful and would have eased the adjustment process. One 76 year old woman had no understanding of the warfarin therapy other than that it was "to help prevent clots". She was confused when asked if her PT or INR ratio was being conveyed to her, stating that she had never even heard the words before.
Despite being in hospital for 19 days, no one had discussed her medications with her. Blood tests were done regularly by a lab technician who came to her home, but she was unsure why. This person was 36 days post-discharge at the time of the interview and had a Public Health Nurse perform four home visits to assess her needs. She had been discharged from the service a few days prior to the interview.

Apart from the woman previously described, the participants who perceived they were not provided with enough information were able to obtain the requisite knowledge from their local pharmacists. Some also asked the family physician who was in regular contact, calling daily to prescribe medication dosages.

In the hospital they didn't teach me very much, but when my daughter went to get them at the drug store, they gave me a long piece of paper about the medication, what it does for you, complications...

Those participants who were motivated to seek information did so predominantly because they were having difficulty with regulating the drug levels. One man, who had what he described as a mild stroke (post-operatively) stated:

I'm on the blood thinners, and at that time I was just home not long and my blood was really thin, so they thought that might be the problem, and then with this eye thing, the blood was too thick, so they thought it was maybe not enough blood getting in or something...

Drug interactions with the anticoagulant were reportedly not well monitored, affecting the participants INR levels. One man was prescribed a drug to help relieve heartburn, however, it
greatly reduced his INR ratio. Another person had her digitalis reduced which in turn affected her INR ratio. It took her several days to determine the cause, and had she not been a health care professional herself, the cause may have remained unknown. In total four such incidents occurred. However, the participants learned from these, and were able to list such things as vitamin K, diet, alcohol and other medications that would affect their anticoagulant level. They emphasized the provision of information related to diet and warfarin as essential.

The six participants who reported adequate knowledge pertaining to their blood tests and anticoagulation therapy reported that the information had been provided to them in hospital predominantly in booklet form by their nurses, and to some extent pre-operatively by their physicians.

Six participants reported an emotional attachment to the adjustment of the anticoagulant. Frustration was expressed when the results were not as expected, and satisfaction was noted when it was. One women stated: "When it's perfect you're all excited and the next day you're pthththth, downhill!"

In considering all of the participants on medications of any kind, ten indicated they were not adequately informed about various aspects of the medications. Participants expressed a need for information related to addiction (sleeping pills), side effects, how to effectively use the drug, and when and how
to stop taking them. They too were able to obtain the
requisite information from their pharmacist, family doctor or
cardiologist. Two older participants (one man, one woman)
stated they had been provided with teaching, but what they said
indicated that they did not understand the information
provided, nor the use and significance of their medications.

...the heart pills.[showing a bottle of sotacor]. They
told me they regulate my heart. How long should I take
them? The first week when I came home, quite a few times
I had very low heart beats and sometimes very quick. So I
was wondering, should I regulate my heart beats with
these?

I was given a pamphlet that explains each medication, but
I was dopey when I left the hospital, so I didn't read
them at first. This one does say to avoid abrupt
cessation of the drug... My sotacor is to stop in nine
days, I feel I can do without it...

It was easy to conclude that the participants did not always
understand the information provided, and that they required
more information relating to their various medications.

The need to carry identification or a Medic-Alert®
bracelet was voiced by five participants. This was deemed
especially relevant for those who had a mechanical valve and
were undergoing warfarin treatment. This information was
volunteered during the interview, perhaps because the
researcher wore a medical-alert® bracelet. Of the five who did
mention it, four said they had been told by their doctors that
they would receive an identification card to put in their
wallets, which indicated that they had an artificial valve.
All five stated they had obtained or were getting medicalert®
bracelets. One participant had been given an information pamphlet pertaining to medic-alert® bracelets while at the surgeon's office, but all five felt it was important to offer the pamphlets while in hospital.

My daughter called all my doctors and they told her what to get put on it and she did. But it was an afterthought.

I know I should carry it [identification], but if I wasn't told and I was an ordinary person, I may not know. But being a health professional, I knew about the medic alert® and I picked up the application in the doctor's office. That was something that could have been done in the hospital so I had time to think about it and ask what goes on it.

Discussion

Much confusion remained at the time of follow up regarding pain and its management. Despite being well reported in the literature as a traditional learning need (Tack & Gilliss 1990), this remained an area which required additional education for most participants. Because it was not provided, the participants experienced an unnecessary degree of discomfort. Additional education is also required to alleviate anxiety and fear related to addiction and dependence.

Participants perceived their medications to be important, but reported being ill prepared to manage their regimens. This has also been documented by Stanton et al. (1984). The lack of understanding relating to medications in general, and more specifically the anticoagulants, gave cause for concern. The group who commented that they did understand their anticoagulants stated they received their information from a
nurse. This would suggest there are individual nurse discrepancies in the post-operative teaching process, and that because of a lack of nursing action (i.e. nurses are not educating patients about their anticoagulants) patients are potentially (and unknowingly) putting themselves at risk of drug interactions and thrombolytic compromise. The nurse should review the purpose of the anticoagulant, its side effects, diet restrictions, contraindicated medications and general safety measures with the patient (Stovsky, & Dehner, 1994). These results are supported by Fitzpatrick and McCone (1991) as well as Finkelmeier et al. (1989) who called for an increased emphasis on patient education by the nurse and improved after care by the health-care team once the patient is discharged from hospital.

Dodge (1969) noted that patients did not concern themselves with things they did not understand. While this may be true for other areas, it does not hold true here. The participants who stated they had trouble with their anticoagulants visited their pharmacists and continually re-read their medication handouts in an attempt to understand the anticoagulation regimen.

The need for a Medic-Alert® bracelet, or some form of identification was accorded much importance by many of the participants. This information, while available in hospital was often not provided. This points to discrepancies in
consistency and content of teaching. More importantly, this inconsistency means that many heart valve recipients do not carry visible forms of identification, which could compromise their health care in emergency situations.

Valve Clicking

Twelve participants had one or more mechanical valves inserted. Seven reported being told that the valve would click with varying degrees of intensity, while five reported not knowing this. All five reported surprise and fear when they first heard the clicking sound.

It scared the hell out of me when I came home because it echoed so loud. It was like somebody dropped a Timex in there.

The first night, I ah heard this noise and I am scared so much. I say oh my God, what is this?

Four of the five experienced difficulties adjusting to the continual sound of the valve clicking.

The clicking, it's enough to drive a person wild and it did! My doctor said you will get used to it. But what do you do now?

These four adjusted to the valve by turning the television or radio on to "drown out" the sound at night. One man said "When it bothers me and I can't sleep I will count the ticks, and gradually I will fall asleep, like counting sheep".

Most of the 12 participants made jokes about the valve,
stating that their friends and family commented that they could hear it clicking. One women said her friends could hear her two feet away, so she told them she was a "ticking time bomb". Other comments included:

She [niece] was sitting next to me and we were reading and she said "Aunty you tick" So we decided I was related to the crocodile in Peter Pan! (laugh)

People have said oh my God, you have two mechanical valves, you'll have your own concert going you know!

The jokes may have been one way of coping with the valve sound, and the resultant attention, although this was never verified with the participants.

Discussion

Adjusting to the sound of the valve clicking is a poorly documented issue to date in cardiac literature (Jenkins et al. 1983). However, the fact that only half of the participants could remember being told their mechanical valves would click loudly serves to reinforce that participants were poorly informed about the nature of the valve. This information was most probably not provided because when the valve did click, the participants expressed fear and did not remember discussing this pre-operatively. Again, had information of this nature been provided in a tangible form, the participants could have referred to it, and been reassured that what they were experiencing was normal.

The Incision
Four participants reported not being given any instruction pertaining to the care of their incision, while an additional nine stated that the video informed them not to let shower water spray directly on it, because this would hurt. The remaining five stated they had been told how to care for their incisions, four because they had asked their nurses or physicians and another because she went home with a dressing on, which required daily care. Incision care varied considerably. Some washed it with a cloth, while others did nothing. One woman boiled water and poured it over a cloth before wiping the incision, believing she was helping herself avoid infections. Seven of the participants put vitamin E or similar creams on the incision regularly. This action was often suggested by a third party. "I was told by good old mom, vitamin E." Despite the obvious variation in incision care, and the lack of information provided, only three stated that they would have liked additional information.

Five participants reported needing antibiotics due to minor problems associated with wound healing. The prescriptions were provided by the surgeons. Interestingly participants called on their surgeons at this time rather than their family physicians, but were not asked why. All participants had well healed incisions at the time of the interviews.

The level of knowledge relating to prophylactic antibiotic
use for dental work was assessed when discussing incision care. Fifteen participants stated they were informed about the need for antibiotics prior to dental work, either through their surgeons or because it was in the discharge booklet provided. More than half of those who were aware of this had known before the surgery and had been using antibiotics. The other three stated they did not know this, and were referred to their discharge booklets for more information.

Nine participants (four men and five women) commented on how they felt about the incision. This was unsolicited information. Three men perceived the incision to be "beautiful" or "clean" and made jokes about it. "I'll tell all it is an enduring scar from my days at Heidelberg!" These men were over the age of fifty and were 8 to 10 weeks post-hospitalization. The 29 year old man who was four weeks post-hospitalization did not like the incision, stating "Scars don't look all that attractive... I am a bit insecure when we're ugh, intimate." Women found the incision to be unappealing at first, but tended to accept it over time. One 65 year old woman who was 7 weeks post-discharge commented:

I burst into tears, and I said to my husband "Look what he did to me!" you know like the surgeon. "Did he have to make such a mess of me?" But now I think, who cares, I am not going to walk around with a bikini on at my age anyway.

The young female participant who was five weeks post-discharge also found the scar unappealing, stating that her friends did
as well.

These nine participants also made comments about their personal appearance when first recovering from the surgery. One man said "I am sure I was a sad looking sack when I dragged my tail in the door" and one women stated "You know my husband doesn't want to come home and see me like that with my hair ugly and everything". It was important for these individuals to attempt to dress, bathe, and be presentable even when they were very weak and fatigued.

Twelve participants discussed temperature changes experienced during the early weeks after surgery. These were described in addition to feeling cold in the early hours after surgery. Three participants described being very hot. One woman described it as menopausal night sweats. The remaining nine stated they were very cold. "Yeah, I was cold a lot. Cold even in bed. I had an electric blanket and had it turned up to the top most of the time...". The most common reason given for mentioning this was that they worried they were catching cold, developing an infection in their incision, or becoming ill. One person bought a thermometer and measured his temperature several times a day, and informed his surgeon about his temperature variations. He was reassured by the surgeon that all was well. Four participants who were concerned about body temperature fluctuations were in the group of five who were given post-operative antibiotics; this suggested that the
participants were in touch with (or closely monitoring) their bodies and the variations incurred.

Discussion

There was tremendous variation in incision care noted. Unlike other studies, the participants did not request additional teaching in this area, despite their worries about temperature fluctuations and potential infections. This may be because they had been home for a minimum of four weeks and had already dealt with the care of their incisions. This is not to say that the incision care provided promoted optimal healing, only that they were satisfied with their healing process, had remained infection free, and did not require additional information in this, a traditionally reported problem area.

It was encouraging to note that most participants had been informed about the need for prophylactic antibiotic use when having dental work done. These results are favourable in comparison to the study undertaken by Fitzpatrick and McCone (1991) who suggested that 25% of their study participants were unaware of the need for prophylactic antibiotic use. This suggests that some teaching had been provided (by whom remains unknown), and that participants did retain pertinent information.

Nutrition

All but three participant described a significant loss of appetite in the early post-operative days.
I lost eight pounds but I couldn't really spare it, but I just had no appetite...

The quality of the food was frightful. If you even had the spirit to take the lid off to have a look or have a smell, well everything seemed to smell the same. They could have just forgotten about giving me a tray cause I didn't eat anything.

The participants universally stated that this was not something that had been discussed with them pre-operatively, nor was it expected, they just "didn't think about it". The loss of appetite was attributed to pain, nausea, weakness, and lack of activity. While this was not something the participants wanted more information about, they did request information pertaining to constipation and their specific nutritional needs.

Eleven participants reported some degree of post-operative constipation. They believed this was attributable to a lack of activity, codeine, reduced appetite, iron supplements and reduced water intake in the early post-operative period. One person said:

Iron is notorious for acting like cement so... ugh, I had my wife pick up some prunes... that helped as much as anything.

All the participants stated they were asked in hospital by the nurses if they required laxatives. Those who did were supplied with them. "They gave us a little ugh, milk shake to cheer us up. That cleared things up". There was little additional follow up. Four participants went home constipated despite being provided with the "milk shake". Three were successful in treating themselves, while the fourth had assistance from the
Thirteen participants reported being on a regular diet, therefore not requiring specific nutritional information. The remaining five were placed on salt free diets by their surgeons or family physician. All five requested specific information related to their diets.

I wanted to know better about the food I eat you know because, you know they just give a book, but you know they don't say too much to me and I wanted to know what foods I have to eat, what is better for me...

Only the pregnant woman, who was in hospital for almost three months, reported talking with a hospital nutritionist. This took place prior to the heart surgery, at a different hospital.

I was given a pamphlet of foods I can or cannot have sort of thing, and this was prior to the surgery. I do have it somewhere around the house, but she explained it well enough so that basically I just, when I go grocery shopping, I just watch to see how much salt content and cholesterol there is in what I am buying, and try and buy the lowest amount.

One individual reported receiving conflicting information in relation to her diet and how to manage it. She was alone post-operatively and had to prepare her own meals.

NO, no nutrition information at all! None. I even asked to speak to a dietitian too because I was quite confused. I am on a no salt diet, then they told me I couldn't cook. They told me that the TV dinners you buy in a store are fine. But they are full of salt and preservatives. So I got conflicting information.

The cardiac surgery unit does have regularly scheduled nutrition classes on Tuesday and Friday afternoons, however the participants were not asked if they were made aware of these.
The classes are well advertised in the hospital hallways, but from the participants' responses, it is clear that the five who would have benefited from the classes were not in attendance.

Discussion

Constipation and a lack of appetite during recovery have been commonly reported in the literature with cardiac patients, and was also seen in this study. The participants did not perceive this as an area requiring additional education. Only those five who were on specific diets prescribed by their doctors expressed specific learning needs in this area. The fact that none of the five participants had attended the nutrition classes offered on Tuesday and Friday afternoons suggests that this service is being under-utilized, or that the participants were simply not informed that the service was available. It is also possible that more people would attend morning nutrition classes rather than afternoon classes, which are scheduled at a time when patients are resting.

Post-Operative Complications

A wide variety of post-operative complications were experienced by the group. Five participants reported having trouble with regulating their heart rate or rhythms. One person required cardioversion, while the other four were regulated with medications. Visual disturbances including seeing spots, blurred vision, and the inability to focus were
reported by five people. Hypotension resulting in imbalance was described by four participants. While this resolved spontaneously, one woman had a fall while in hospital. Two participants reported what they termed "mild strokes" post-operatively. The pregnant women also had what she described as a mild stroke pre-operatively. None of them sustained residual effects. A total of 13 participants reported the above noted complications which occurred before surgery (one) or during the first three weeks after surgery (12). While the heart rhythm troubles and hypotension commonly occurred in hospital, visual disturbances and mild strokes did not. Since these occurred at home without any warning, family stress and anxiety were experienced.

If the patient was told that things like that could happen, they wouldn't be so scared when it did happen. I have had some pretty horrifying experiences. For instance, I have been down to emergency because my heart was racing.

The participants clearly perceived a lack of information in relation to potential post-operative complications.

**Return to Work**

Of the eight participants who were not retired, five expressed a fear of returning to their employment, stating they had been given little or no information pertaining to this.

I'm definitely not going to go back to my type of job. I do custodial work at the school. So there is a lot of carrying and lifting of garbage, vacuuming, damp-mopping, and now we have that giant machine!
Well nobody told me anything about it. I was told I would be off for about three months and that was about all.

Two men stated that they had lost their jobs due to the physical exertion required and their perceived inability to do this post-operatively. One man was a carpenter and the other a restaurant manager. One woman was eager to return to work, because she felt capable of doing so after being off work for only seven weeks. She said "School started today, well, I should be there. You know I am just sitting around now!"

Despite the social safety nets of Canadian society, five participants described the significant financial impact the process placed on them.

Financially around here we are not doing so hot either, 'cause of all this I haven't been working. We're going down from making ugh, you know 3-4 grand a month to 1200 a month, welfare.

The first month, you know, we were going through such a bad time financially and everything, so there was added stress coming from that.

A self-employed accountant stated that he started working again while in hospital. He stated his clients had government tax deadlines to meet, which were not flexible. Furthermore, he had a mortgage to pay and no one else was going to do this for him!

If you don't work there is no money coming in... I can't see if it makes a lot of difference if I work or not. I read a book and that is an expenditure of energy, no more so than reading a ledger.
Discussion

With valvular heart disease being a chronic illness, it was not surprising that only eight participants were working and that multiple adverse events were encountered after surgery. That few knew about the potential adverse events again calls in to question the issue of informed consent. This author is of the opinion that those who are scheduled for open heart surgery should have reference information provided pre-operatively.

The statements indicating uncertainty pertaining to the ability to return to work support the research done by Clancy et al. (1984), and Allen (1990). They have previously noted that perceptions of health status act as a significant indicator of return to work after CABG surgery. It is not known at the time of writing whether these participants returned to work. However, none of the eight made mention of engaging in any organized rehabilitation program, which would assist in preparing them for their return.

The financial burden placed on individuals as a result of the surgery is a poorly documented problem in Canadian cardiac literature. The social safety net has traditionally meant that this is not a consideration for most, because there are no direct costs (such as hospital bills) incurred. Because five participants clearly noted this as a concern, it is becoming increasingly evident that changes to the social system will
financially affect the average surgical candidate. While this problem is in its infancy, it needs to be monitored as the process of economic change continues.

**Emotions**

Various emotions were described based on the experiences encountered. Three participants experienced active post-operative hallucinations, requiring psychiatric intervention and medical treatment. The participants found the hallucinations to be distressing, stating they had not been told this was a potential or expected complication from the surgery.

We [the participant and the man in the bed next to him] had hallucinations, disorientation for several days that were really quite severe. We hadn't been warned about this at all... I didn't know where I was and couldn't figure out why I was there. It was quite alarming you know.

Upon questioning, the participants agreed that had they and their families been told of this potential reaction to the procedure, it would have made coping with and understanding it, much easier, especially for their families.

The other 15 participants experienced a more "routine" recovery. All the participants described at length the emotions they had experienced in the weeks following their discharge from hospital. The emotions most commonly expressed included fear or being scared, worry, anxiety, depression, relief, gratitude and euphoria.
Fear was most commonly discussed in relation to the heart valve, its potential for failure and the need for repeat surgery. This was discussed by 11 participants.

I don't wanna go a back again [to hospital]. I'm too old.

How long is the valve really good? Ten or 15 years, then what?

I know if the click doesn't sound, then I'd better go [to hospital], if I am able to go...

Along with general fear, a specific fear of death was expressed by the majority of the participants. This was not related to valve type:

I have the fear of the blood clot. They say that if it does build up and a piece does go, it could end up anywhere, some place where it's harmless but then again it could end up in my brain and I could have a stroke, or you know... So I have to deal with that.

I was worried about the pig valve, because it sort of puts a lease on my life. It is not very strong. ...my doctor didn't like to discuss it with me very much. He just said it would be fine. I hope I don't have to go again.

Three participants expressed concern about overexertion and how this would affect the valve. This was not valve type specific.

There is no work that I haven't been able to do around the house. But will I get hurt or ugh, make my valve more weak if I work that way again like I did? Do I have to keep back?

Will it really do something to my valve if I, let's say lift up something, what happens? Can I hurt myself?

All reported being scared, worried or anxious post-operatively.

My doctor thought he heard regurgitation in the valve and that scared me. I thought oh, I got a bad valve!

Four participants worried about having had blood transfusions.
I hope my blood is not tainted. I told them I wanted a guarantee! It's just that that's the thing in the news all the time.

You are scared a little bit to get the blood because you are reading so many things, tainted blood, all kinds of sickness... When Dr. comes to the hospital I say to him, you sure I got the right blood?

The woman with the newborn voiced worry pertaining to her baby getting used to "kind of like a new heartbeat". Her child was being cared for by her mother because she could not lift her; consequently she had not yet been permanently reunited.

Several participants were scared to climb the stairs in their own homes, despite having done so in hospital prior to their discharge.

I go and half way and stop then go. I just stop because I want to stop to be sure, I scared.

Eleven participants stated they were worried about and felt the need to protect their sternal incisions.

Like when my little grandson comes running and wants to give me a hug. I am so scared about him coming and touching me in the chest. It's terrible, I don't know how long that will last...

Feeling down, or depression was experienced by 12 of the participants. However, only three were not told this would happen. The other 15 stated that this information was provided in the video, books they had read, or by their nurse or physician. They were told it was normal and that it would pass. Three men and four women admitted to crying uncontrollably and for no apparent reason during their "down
Man, I cried like a little baby since I have been out of hospital! It stopped now but for the first few weeks I couldn't stop the tear ducts from going.

Eight participants expressed gratitude and relief that the process was undertaken and now over with. The two youngest participants most clearly expressed this.

It's been hard, but hey, I get to watch my kids grow up, I wouldn't get to otherwise, and for that I am thankful.

I'm 29, and I just wanted this over with, now it is.

From these descriptions, it is evident that despite having been through the surgery successfully, the participants continued to have ongoing fears, anxiety, worry and depression.

Throughout the interviews, all 18 participants expressed the idea and hope that the future would be brighter and better than the past. They believed they would eventually have more energy and planned future events such as travel, moving to newer or smaller homes, dinner parties, or new employment opportunities.

Three to four months down the road I will feel like I was 16 again health wise. I focus on that.

I'm hoping for the energy of a young person. So many people have said this will happen.

Mixed in with the "down days", it would appear that the recovery process brought with it a hope for improved quality of life in the future.

The participants were eager to offer unsolicited opinions
about the hospital physicians and staff. Eleven participants stated their surgeons were satisfactory.

He is godlike!

It was just such a blessing to have the surgery done with Dr. X's healing hands!

Three participants were angry with their family physicians or cardiologists for having misdiagnosed them, and one simply disliked the surgeon. Descriptions of the nurses were more varied. Ten participants praised the nurses and the care received:

I think it's tender loving care around there, yes... I must honestly say I think we are fortunate to have the group of nurses we have there. They must be chosen to go there, they are special you know!

Three participants noted variations in the services received, depending on the nurse for the shift and that nurse's caseload. Four believed nurses worked too hard. Only two participants did not like the nursing personnel. They said:

They never come and see you. Somebody brings you food and leaves it there. If my wife wasn't there I wouldn't eat anything at all. Nobody checked on how much I ate, drank or whatever.

Two positive comments were received in praise of the nursing services provided in Block A (step-down unit) and the Cardiac Surgery Intensive Care Unit (CSICU)

Especially down in the slaughter house, the CSICU, yeah, they were fantastic down there.

Discussion
Cronin (1990) noted that patients who displayed signs of emotional instability at the time of diagnosis were more likely to experience complications post-operatively. This trend was not observed; however, this conclusion is based solely on what the participants told the researcher.

The fact that only three participants experienced delirium post-operatively was surprising. This is lower than the statistics reported in other research, such as that undertaken by Kloosterman (1991), who reported a 24% to 72% rate of post-operative delirium. The reasons for this are unknown. The three who did experience delirium requested that in the future, information about delirium be provided to participants and their families pre-operatively. This has been suggested in the literature (Kloosterman, 1991) but appears to have been poorly implemented to date.

While Cronin (1990), MacKenzie (1993), and Raleigh & Odtohan (1987), have reported anxiety to be a common psychological response to the surgery, the various fears specifically relating to valve failure have been under-reported in the literature (Jenkins et al. 1983). As Finkelmeier et al. (1989) noted, once the valve is in, the potential for valve related morbidity is present for life. Consequently, the participants concerns were not unfounded. Some anxiety will undoubtedly remain, even with the provision of information and education related to the valve and its life expectancy.
Fears related to the blood transfusions might again best be explained by the news media. An inquiry into the Canadian "tainted blood scandal" of the early 1980's was being conducted and publicized at the time of the research. This could explain why this has not been a previously reported concern for cardiac surgery patients. A discussion pertaining to the fact that blood transfusions might be used during the surgery should be undertaken as part of the routine pre-operative instruction. Patients have a right to refuse blood transfusions and this needs to be noted as part of the informed consent process.

Emotions such as crying, depression and relief were reported in this study and are common to cardiac patients in general (Jenkins, Stanton, Savageau, Ockene, Denlinger, & Kleine, 1983; Rankin, 1990). The participants did not request additional information pertaining to emotional adjustments, stating they had been well informed through their nurses and the video. This suggests that patients do retain some of the information provided prior to discharge.

Along with wanting to resume a normal lifestyle, the participants had hope for the future. Some were still attempting to discover what impact the surgical event would have on their lives. Consequently, the rate of psychological recovery varied.

It has been well documented in the literature that a sense of euphoria and elation are common post-operatively.
Therefore, it was not surprising to have patients praise the hospital staff.

No attempt was made to specifically measure or compare the participants functional status with psychological outcomes during the interviews. While some of the participants described themselves as physically and psychologically healthy, others did not. A few participants expressed the thought that the days when they were more energetic, they were also in a better mood. However, the youngest and fittest participant, a self-proclaimed "body builder", described himself as a "psychological mess" since the surgery, despite having more energy. While not specifically studied, the field notes, observations and interviews from this study support Greenland (1988) and Bengtsson (1983) assertion that there is no proven correlation between exercise, functional status and psychological outcomes for these participants.

Support

Due to fatigue, and a lack of energy and mobility, the participants required extra support to help manage their routine activities. The participants, universally stated that this had been made clear to them by their surgeons prior to the event.

I was told I would have to have someone there to take care of me, more or less baby sit me is what it boils down to. And I wasn't too thrilled about that, as I am a strong willed, stubborn, Irish woman.
Most participants stated that adapting to this was difficult and that at some point during their recovery, they perceived a loss of independence. This was most emphasized by participants who had no partners. They commented:

It is really hard for someone independent to become totally dependent. That is what I felt, totally dependent.

When you've been independent a long time and that independence is taken away from you, it's very hard to adjust.

Eight participants stated that they had also felt "over-protected" or "over-supported" by their partners or family members during their recovery.

He was just so damned helpful that it was irritating... he is right there, Johnny on the spot and it's like go away, let me breathe! I felt like an invalid because everybody was doing everything for me, you know it's not like I don't have arms and legs. I found it a real pain in the ass, but I know it's because he loves me.

Despite this, the participants married or single, universally agreed on the need for support from family or friends during the recovery process. Comments included:

I am not sure what I would have done if I didn't have someone staying with me...

You can't let a person go home and be alone.

Only one woman was alone during the recovery process. She purports to have told her cardiologist that her recovery was hindered because she had been living alone after discharge.

I said to my doctor, people who live alone often don't recover as fast because of a lack of support.

The five unmarried participants arranged to have friends stay
with them during recovery. The woman who was alone had arranged for someone to stay, but the person was unable to at the last minute. Those who were married arranged for brothers, sisters, siblings or friends to assist where and when needed. Eight participants noted their friends had been instrumental during the recovery process.

My friend is a cardiologist in Montreal and he helped. He was in constant contact. He told us what questions to ask, when and how to ask so we didn't alienate anyone. He was a very important person for us.

Fourteen participants expressed the need for reassurance and validation from their support persons about their recovery. This was most often sought from family and friends, and occasionally their physicians.

Well you look forward to the family visiting every day and if they can't get there for some reason it is a disappointment, even if you are feeling well. Because you like to be reassured that everything is going well.

I said "Are you quite pleased with me Dr. X?" and he reassured me he was.

Eleven participants compared their recovery process to that of others they had known, or met while in hospital. This process provided additional reassurance that all was well.

I kept in touch with two women from White Rock who had the same thing as me. That was good. It didn't make you feel like you were an odd person out, that you should be getting over this quicker.

Strangely enough, I think I was in better shape than most of the others on the ward... Inevitably you compare yourself to the others on the ward. I felt smug and superior because I was in good shape in comparison.

Only one participant, the woman who was alone during recovery,
stated that comparing her progress had a negative impact.

I phoned [the Pacific Open Heart Association] to ask if what was happening to me was normal and she compared me to herself. She had bypass. She was off her Tylenol #3 in three or four days. She done all this exercise. It kind of made me feel like gee, I almost wish I hadn't called.

A variety of supports were needed by the participants.

Additional assistance was sought by most of the participants for bathing, grocery shopping, cooking, obtaining medications, dressing, doing laundry, mobilizing and getting to and from appointments. Eight participants utilized various community services, including meals on wheels, home-care, lab on wheels, and the Public Health Nurses.

I feel I have had very good support from the Metropolitan Health Unit here. I have a home-maker now, and the nurses come in, a girl comes to take my blood too.... I find this has been a great help.

The female participant who was alone commented that despite being in hospital for ten days, she did not meet with the social worker to arrange the requisite services until the day of discharge. Because the discharge was hastily arranged, she felt she had received less than optimal service and care.

It would have helped if I knew sooner about the different kinds of home making services that were around and what they did and how much they are and whatever kind of help there is, for at home. I'm paying for this and all I am getting is soup!

It was evident that all the participants perceived the need for general assistance during recovery. Those without partners or significant others were most reliant on the community services available.
Family proved to be an integral part of the support process. The participants who had family made it clear that they were conscious of the strain their surgery had placed on their family members. Comments included:

They told me aortic stenosis can have a genetic basis. I have a daughter that is married and lives in France. She was quite upset at the prospect of being faced with this at some point in time. But there is some genetic predisposition for this I guess, so I had to tell her.

You want to cuddle and play but you can't because they [young children] bounce around and that. I have already been nailed by them a couple times... So they got up and went and cuddled with my buddy... that sort of thing, it really is heart breaking.

The perceived strain that the surgery placed on the family relations was validated by the wife of one participant who wanted to listen in on the interview. When the interview with her husband was over, she commented:

One night there was a fire down the lane, and I wondered how I was going to evacuate him quickly if I needed to. I worried a lot about things like that.

Aside from family and friends, support was also acquired in the form of religious and spiritual affiliations. Only two participants stated they had visits from their ministers while in hospital, or recovering at home. Four participants stated that they would have liked to have someone visit them, but they were not made aware that such a service was available in hospital.

I am in the process of, I'm not a spiritual giant or anything, but I am in the process of going along with the spiritual lines of life as opposed to being an asshole in
life, so a visit from a minister would have been good, yeah.

The remaining participants stated they had no religious affiliations, and as such did not require specific services.

I am agnostic. I went through five years of the war without needing the Lord at my side, so I would be a hypocrite to call on him there.

However, nine stated that they were not asked about their religious or spiritual needs as part of the admission procedure. While only a few participants expressed needs in this area, it can be surmised that religious and spiritual needs for this patient population were poorly assessed in hospital, and were generally not responded to.

Discussion

The need for support, the loss of independence, the need to compare oneself to others and the feeling of being over-protected are all commonly reported in the cardiac literature previously reviewed. Family and acquaintance support were called on to provide reassurance, validation and assist with daily activities such as grocery shopping, which is also well documented in the cardiac literature. The fact that single people perceived a greater need for support services, but sometimes found it difficult to find and access these is significant. One person who did not benefit from community social support admittedly recovered at a slower rate, both emotionally and physically. The study by Zyzanski et al. (1981)
supported a relationship between post-operative psychosocial functioning and physical status. While most of the participants received the necessary services, the fact that one did not generates the question "why?" On this specific ward, the assessment for these services is undertaken by the social worker and sometimes the nurse. Given the noted deficiencies, the quality of the assessment process warrants review.

It must also be remembered that support services include spiritual or religious orders. While this is belief related, it was generally poorly addressed in this patient population. While few people expressed a need in relation to this issue, those who did not have their needs fulfilled in hospital expressed their disappointment that services were available and they were not made aware.

Section Summary

This study did not constitute an evaluation of the discharge teaching program. As a result it is difficult to comment on retention and understanding of material presented to the participants prior to discharge. What is relevant is that the majority perceived parts of the discharge teaching to be inadequate. However, the fact that they were able to remember specific information relating to such things as incision care, showers, driving, and mobilizing in and out of bed, suggests that formalized learning relevant to their needs did take place through the planned educational program.
Section Four: Addressing Learning Needs

Post-Operative Education

Fourteen participants agreed further post-operative or post-hospital patient education would have been helpful. One person commented "Yes, because you can't ask a video tape a question!" Ten participants offered unsolicited comments indicating that they were "fuzzy", "didn't remember", or "couldn't keep the information in" at the time of hospital discharge.

When you're just about to be discharged you're not all coherent either... Some of the stuff from when I left hospital is a little bit fuzzy you know.

One woman commented that the discharge instructions provided were given to the wrong person!

On discharge, the nurse rambled a bunch of things to my sister in-law and I thought she shouldn't have done that. My sister in-law has only been here the day she brought me home. She should have told me the stuff, so I would have known!

Two participants commented that while they did receive information pertaining to what not to do, they did not receive information pertaining to what they were allowed to do, to assist with their recovery.

They didn't explain a lot of the things I was allowed to do to help my recovery. When I left there I kind of wish I had some idea of what I could do, not of what I couldn't do.

Of the four participants who perceived the discharge process to be adequate, one was the pregnant woman who had spent three
months in hospital and had received an abundance of "one on one" education. Another was the accountant who continually denied his illness (calling it a simple mechanical defect), and had no desire to change his lifestyle. The other two, despite saying they did not need additional information were the two who did not know what type of valve they had implanted and were generally ill-informed when asked questions pertaining to their illness. All 18 participants asked questions of the researcher pertaining to information they would have liked to have received during their recovery process. This in itself indicated that some form of follow up was warranted with all 18 participants.

Educational Materials

Despite not being asked to specifically evaluate the educational materials provided, most of the participants made comments pertaining to the utility of the discharge booklets, the discharge video, and the other forms of literature. The discharge booklet was perceived as "good" by all but one of the participants. This woman could not read her surgeon's writing, which rendered the information provided "useless". Despite universal agreement that the books were informative, several concerns were raised about their use. Two people (one man and one woman) commented that they were not able to read. Had their spouses not been able to, the booklets would have been of
no value to them. Both participants volunteered this information, because they believed that those who do not read are embarrassed to admit to it. Consequently the ability to read English needs to be assessed in hospital prior to providing patients with the discharge booklet. Two participants discussed blurred vision for weeks after the surgery and believed that they were not able to read the booklets properly. Two people commented that the books were fairly basic and could have included more information, while two of the Asian participants commented that the reading level was difficult for them. The others did not comment on this specifically. From this it can be surmised that the reading level was adequate for those who read English, but that it was difficult for those who struggle with written English.

One woman took issue with the book "prescribing" dates for the resumption of various activities.

Six weeks you should do this, eight weeks you should do that. But then, I know everyone is different, but it's in black and white there in the book, what if you're not up to it then?

Several participants commented that they re-read the discharge booklets or the coumadin booklets periodically. They found this very useful.

They also gave me one on coumadin that I re-read every so often to make sure I understand what is going on.

Four participants were given access to, or had purchased books from, the Pritchett and Hull series of educational,
cartoon based books, pertaining to recovery from cardiac illnesses. They all believed these books to be of great benefit to them and recommended that they be available to those undergoing open heart surgery.

That book is very good. The book doesn't explain all the unnecessary stuff for patients to know. Because we are not doctors, therefore we don't understand... It gives us names, and what to do...

It is very educational, as it tells you what you can do after so many weeks. It is a good guideline for recovery, as it tells me what I should do!

The hospital does own a series of these books, but they are not available to take home. They are for sale in the hospital's gift shop for under $7 CDN. It would seem only a few of the participants were made aware of this useful resource.

The discharge video was praised and described as informative and useful by 16 participants. One person stated that "It sort of impresses it on you more than just reading things". Another person believed it would have been helpful if the video was available on a loan or purchase basis. He stated that it was easy to forget what the video said, and that if he could have taken it home and repeatedly watch it, he would have learned more about his recovery. He added that he was willing to buy the video for a nominal fee.

A single woman commented that the video was produced with married couples in mind. She stated that this was no longer the norm in the Lower Mainland as the great majority of older
people live alone. She believed a video on how to manage on your own, or with limited support would be helpful, and that it should contain information relating to the community services available throughout the Lower Mainland and how to access these.

Discussion

Those participants who were literate in English reported reading the discharge booklets and this seemed to be their principal (and often only) source of post-operative educational material. This result is tremendously encouraging for those who spend the time and effort in creating such educational material. However, nurses must remember that providing the patient with a book does not relieve them of their duty to tailor patient education to the individual needs expressed by the patient. Nurses must make patients aware of the learning resources available on the ward, such as the "Pritchett and Hull" series of books (by Gassert & Burrows, 1993), the nutrition classes, and the video.

The video was praised by all the participants. Some of the information in the video was not remembered at the time of the interviews. As a result, patients who require it should be sent home with a copy of the video, or an audio-taped version of the information provided. They could then watch the video or listen to the tape at a later date when they are less "fuzzy" and motivated to learn. This may also prove beneficial
to family members. The cost of such an exercise could be passed on to the consumer, or it could be made possible with the assistance of the Pacific Open Heart Association. More importantly, it must be recognized that the video, while a reasonably effective educational tool, was not able to meet all the educational needs, and is therefore only one of many mediums required for comprehensive patient education. This lends further credence to the need for alternative forms of post-operative education and follow up once discharged from hospital.

**Encountering Learning Needs**

The stories told provided a clear indication as to when the learning needs arose. Participants discussed many of their difficulties in hospital, and how it was hard to adjust in the early days and weeks at home.

- The first three weeks after the surgery were the most difficult, because it's all new and you have to adjust.
- The first two weeks was bad, and the first week in hospital was hard too.

It was evident that all 18 participants found the week in hospital and the first two to three weeks after discharge to be when they encountered most of their learning needs.

The answer to "when" would be an appropriate time for additional discharge teaching varied. Only three participants believed additional follow up, done after they were discharged
from the hospital would be beneficial. Their rationale was that they were not coherent when they left the hospital, and given a few days, their retention and understanding would improve. The remaining participants stated that if there were to be additional teaching undertaken it should happen while in hospital. They perceived that they had ample time in hospital, and that the information provided would be required before one is discharged.

Well, getting it a couple of days before you're discharged.

I had lots of time while I was in there; I was bored silly.

They believed that post-operative education should be undertaken prior to the day of discharge, with seven participants noting that they could have been given additional teaching on "moving day" when they were transferred from Block A (step-down unit) to West 10A (general ward). When asked why they were so specific in suggesting this day, the participants replied that receiving the information several days before hospital discharge would give them time to digest the information or read through the pamphlets, and formulate any questions they might have. They could then ask their doctor, physiotherapist, nutritionist or nurse about outstanding issues.

Discussion
Determining when the learning needs arose proved to be relatively easy despite the participants not providing exact dates as to when they first noticed a lack of relevant issuespecific material or information. The days in hospital and the first few weeks at home were the most difficult to adapt to, and were most commonly discussed. Consequently, this is the time when most needs were realized and expressed. This has been noted to be common in the cardiac literature, and has been investigated somewhat by Beckie, (1989) and Tack & Gilliss, (1990).

The majority were able to choose a specific time and day "moving day", for the discharge teaching. However, ten participants noted that they were "fuzzy" on the day of their discharge. These results are therefore conflicting. What is inferred is that if patient education is to be undertaken while in hospital, "moving day" is probably the best day to do it.

The participants were not specifically asked if they would have benefited from follow-up at home, because this would have been leading the discussion. However, the many difficulties encountered post-operatively (such as the anticoagulation management) and the fact that patients are not aware of all of their potential learning needs prior to discharge, suggests that follow-up education could be required once discharge from hospital. While this has been suggested by a number of researchers including Beckie, (1989), Stanton, Jenkins,
Savageau, Harken & Aucoin (1984), Tack & Gilliss, (1990), it was not specifically sought by this patient group.

**Education: Transferring Knowledge**

The participants were asked "how" they believed health care professionals could best address their learning needs. Seven participants suggested that "one on one" discussion with someone who was not perceived as too busy would be best.

A little bit of actual talking and telling is often better than a book or something you know. It's very reassuring.

The lowest pupil teacher relationship in the world is one to one and that's frequently what works best. I guess because it is so intensely personal.

The participants recognized that this suggestion was not necessarily practical, and so proposed a number of other suggestions. Six participants suggested seeing the video and being provided with the discharge booklet at the same time. Even if the doctor had not filled in the booklet, being provided with them simultaneously would provide reinforcement of the material presented in the video. This way, they would also be thinking about, and planning for their return home.

Four participants suggested that the Pritchett and Hull books be made more available while in hospital. Again these would help patients by answering many of their questions. The books provide common guidelines, such as most people heal in x number of weeks, and you should start walking x blocks each day.
One woman suggested an audio-tape be made available for people to take home. While not everyone has a VCR, she believed most would have a cassette player. The tape could be re-played periodically for reinforcement of the hospital teaching. She believed this would be of additional benefit for the blind and those who could not read very well.

Two participants asked for an information line or number, so they could call in and ask questions. This would not necessarily be run by the hospital. They believed the volunteer heart association was all that was required, because the volunteers could talk to patients based on their own personal experiences. This would also be an accessible form of reassurance and validation for the patient.

I really think that you should have a volunteer number for heart patients... to give to other heart patients... So that they can contact somebody there and say this is what I am going through. The other person can say, don't worry about it, it's part of recovery.

When asked who should do the teaching, the participants gave a variety of answers. Seven participants wanted their surgeons to do the teaching. Seven participants said that nurses or nurse specialists would be capable educating them. One of these participants supported his choice with this rationale:

The nurse. They are doing the work in the facility so they have the best information. An ordinary nurse will not know as much about heart operations. You need someone who will know about it. Let say ugh, somebody has to explain what is in the chesterfield, you don't go to the butcher because he is not much help! So somebody that
works in the heart operations place, they know what is going on and can explain what is the best for you.

Of these seven, two chose the nurse because they perceived the doctor to be too busy and as such should not be expected to deal with this.

Doctors are too busy, you can't expect them to, so who would you turn to next? Your nurse!

The author wondered if some of the participants may have chosen nurses because the researcher had identified himself as a nurse at the beginning of the study. This identification may have influenced some participants' decisions.

Two participants stated that teaching should be done by whomever was the expert in the area. For instance nutritional counselling should be done by a dietitian or nutritionist. They said they would ask nurses some questions and doctors others. Two participants said they were not sure who to ask because the doctors were too busy, and the nurse deferred to the doctors.

I am not sure all the nurses really had all the information you know. If they did have it they didn't want to make statements which were transgressing on the doctor's word. So they said you have to ask the doctor a lot. They didn't want to give information contrary to what the doc said, but the docs were seldom available.

From the responses, it is evident that the participants sought either a doctor, or a nurse who was deemed an expert in the area of cardiac care to address their learning needs. This person must not be perceived as being in a rush and must appear
All participants requested additional education during the recovery process. The majority viewed their physicians, cardiologists and family doctors as their primary source of information and validation. Less than half of the participants acknowledged the nurse as the prime educator. Karlick and Yarcheski (1987) reported similar results. Consequently, it is probable that until patient education is undertaken vis-à-vis the role of the nurse as a patient educator, an attitudinal shift will not occur, leaving the physicians as the "trusted" educator.

The family physician's role, while not specifically evaluated, may have provided much education, reassurance and validation to the participants. Those on an anticoagulant were in the closest contact with their physicians, because they called daily to adjust the medication dose. This is significant for the post-operative education process. Family physicians may currently be under-utilizing their role vis-à-vis post-operative heart valve replacement patient education and rehabilitation.

The study's results lend credence to the idea that patient preferences need to be assessed and validated before any education is undertaken. The majority stated they would prefer one-on-one teaching, if at all possible. Small group teaching,
such as the type undertaken in the nutrition classes needs to be reconsidered as this method was proven to be ineffective, simply as a result of the lack of desire to attend. Vancouver is a multicultural city, with diverse ethnic populations. English was not the first language of many of the participants, so alternative methods of patient education in other languages and through other mediums must be considered.

**Henderson's Framework**

Henderson's philosophy (1961) was used as a conceptual guide for the patient interviews in this study. Henderson's fourteen needs were specifically used as prompts for the participant interviews. As seen, the prompts proved useful because they provided a general framework for fully exploring the process of living through heart valve replacement surgery. They encouraged patients to ponder issues they had not yet discussed with the interviewer, and aided in discovering new information and issues relevant to the recovery process: the trouble encountered with sleep due to the heart valve clicking, the need to protect one's sternal incision from others, female participants need for breast support and such issues as body temperature fluctuations.

The results of the study lend credence to Henderson's claim that people will independently undertake the requisite activities to meet their various needs if they have the
"necessary strength, will or knowledge" to do so (1991, p.21). A good example of this was observed with the participants resumption of driving. During recovery, some participants reported not having the strength and confidence to drive, and so delayed this activity, while others engaged in this activity sooner than even recommended by their physicians as they felt ready to do so. In addition as Henderson proposed, most participants stated they required assistance with their recovery because they were incredibly fatigued and lacking in strength.

The need to learn, or acquire knowledge (need 14) and the motivation to meet this and other needs, which Henderson stated leads to "normal" health, was evidenced in the various needs expressed by the participants. Many of the needs related specifically to knowledge acquisition, how to obtain the requisite knowledge, and the subsequent behaviour changes. For example, the participants required information, confirmation and validation of which activities they were allowed to undertake to improve their physical state, as well as education related to medications, anticoagulation therapy and pain management, all of which assisted in attaining the goal of independence. The nurse, as the "prime helper" (1991, p.24) during recovery assisted the participants in obtaining this requisite knowledge. The overall goal expressed by the participants was that of returning to a normal lifestyle, which
is congruent with Henderson's philosophy.

While Henderson does not specifically address the issue of timing when discussing the provision of education, her philosophy states that the patient will require teaching and learning when a new need develops. The majority of the participants validated this by stating that additional follow up while in hospital, during the time they were experiencing their "acute" event, would be helpful. It can be inferred that the requisite teaching or processes required for knowledge acquisition and behaviour change should occur when requested and required by the patient.

**Summary**

The learning needs expressed by the 18 participants were reflective of their individual situations and experiences from diagnosis to recovery. The participants were expressive in their perceived lack of choice as it pertained to the surgery and the type of valve they had implanted. They expressed surprise and concern with the lack of information given about the longstanding fatigue and weakness experienced post-operatively. Their reported learning needs centred around mobility issues such as lifting, reaching, pulling, pushing and driving; resumption of general activities including exercises which would assist with general fitness; pain control; medications, specifically anticoagulation therapy; emotional
issues from the time of diagnosis to recovery; the need for support from family and friends and the need for community support for those who were single; general adjustments required including valve noises, incision care, body image, appetite and nutrition, potential complications and employment. Time brought with it a hope for the future and the gradual resumption of routine and sexual activities.

The pre- and post-operative teaching received by the participants varied. However, most believed the information from their doctors, nurses, videos and books to be beneficial to their recovery. Some participants more eagerly engaged the recovery process by taking an active role in their learning, either through discussions with friends, reading books or asking questions. Overall the participants believed additional follow-up, predominantly while in hospital, would have assisted in the recovery process. The majority believed this should be done on a one to one basis, preferably with someone deemed an expert in the area of cardiac care.

This chapter has presented a general description and discussion of the learning needs of 18 patients who underwent surgical heart valve replacements. Chapter five will look at the conclusions to be drawn from the study, and the implications they hold for nursing practice, education, research and other health care professionals.
In this final chapter, relevant conclusions are drawn and the implications the study has for nursing practice, education, research, and other health care professionals are highlighted.

Conclusions

As anticipated, some of the learning needs for heart valve replacement patients were similar to those of CABG or MI patients. Common learning needs included: the need for information and education related to fatigue, mobility, pain management, diet, lack of appetite, constipation, emotions, and incision care. Overall, the specific needs expressed by the participants varied, as did their desire to learn about specific aspects of their recovery. Participants sought information and education specifically related to their individual needs (such as regulation of anticoagulants) which lends credence to Knowles (1985) theory of adult learning which suggests that adult learners will learn best when they perceive a need. Participants were willing to make some adjustments to their lifestyles in areas they viewed as important but set limits on the extent of the adjustments.

Some of the usual topics in cardiac education including the anatomy of the heart, general medications, alcohol and smoking cessation were barely mentioned by the participants.
From this it is possible to conclude that patients with heart valve replacements experience different learning needs post-operatively. This study did not constitute an "evaluation" of the teaching carried out, hence it is not possible to conclude that additional information was not required in these areas, only that the participants did not find them important enough to mention as essential during early rehabilitation.

Patients require more information and education pre-operatively about the valve types, the surgery and the potential complications. They would prefer that this information be provided by their surgeon. It would be beneficial to have "tangible" information (such as a video or pamphlet) provided during the surgical consult. This would allow patients to refer to the information at a later date, and would assist in clarifying misunderstood or forgotten but relevant issues after the initial consultation. Overall it would reinforce the educational process and assist the surgical candidate in providing informed consent.

Consistency in the educational process needs to be addressed by the health care professionals providing the teaching. While this study acknowledges that participants have unique learning needs, some participants were not even provided with basic information pertaining to such things as their medications and pain control.

Health care professionals continue to find it very
difficult to discuss the resumption of sexual activity with patients. The reasons for this are unknown, but both patients who were sexually active pre-operatively and those who were not expressed a need for this topic to be addressed.

Personal preferences were expressed with regard to the timing, method and amount of information required. Consequently, a thorough evaluation of the patient's learning methods and learning needs is required, before the educational process is implemented.

Finally, it is relatively rare to find a cardiac study which is representative of both the male and female population. Some specific differences were discovered in the learning needs between the sexes. Overall it is believed that these results justly represent the perceived learning needs of both female and male cardiac patients during the early weeks of recovery.

Implications

The results of this study hold implications for nursing education, practice, research as well as for other health care professionals.

Implications for Nursing Education

Most participants stated that nurses provided them with some information while in hospital. Therefore, nurses as students must learn to assess the patient's perspective as part
of the learning needs assessment. Individual learning needs are derived from both past and present experiences. Patients may only want to learn about certain issues or subjects and not others, or they may already be knowledgeable in certain areas. Consequently nursing students must be aware that the patient's perspective constitutes an integral part of a thorough learning needs assessment. With this perspective reinforced at the classroom level, it is hoped that the nurse will, once in practice, be more aware of the patient perspective, analyzing it more fully, and incorporate it in practice. It is recognized that this is not new information; however, the issue of nurses learning to fully assess patient needs requires reinforcement.

Implications for Practice

Reference materials are not presently provided to every surgical candidate, evidenced by the fact that half of the participants searched libraries and pharmacies for additional information. The provision of educational materials such as a pamphlet or video outlining the "pros and cons" of each valve and some of the potential but normal side effects encountered after surgery (such as hallucinations, hypotension, stroke) would serve to reinforce the patient education provided, and would potentially reduce the number of questions repeatedly asked of surgeons, nurses and office assistants. It would
represent a paradigm shift towards what Sullivan (1993) termed a "learner controlled system". Participants would be able to access information at a time when they were ready, wanting or feeling the need to do so. This process may also serve to reduce fears, thus assisting with post-operative adjustment. If properly educated, patients may even decide against surgery. However, this is speculative and requires empirical validation.

The methods used to provide information and education represent a constant challenge to health care professionals. This study reinforced that not all health care users are literate, and that individuals express their learning needs in different ways based on cultural, ethnic and religious beliefs. As a result, nurses and other health care professionals alike must find new ways of recognizing and meeting the consumer's learning needs.

Patient education, leading to informed consent, is equally a nursing responsibility, one which seems to have been somewhat lacking with this group. The fact that not all of the participants were provided with pre- and post-operative education raises the question whether patient education is a nursing priority, or if nurses have the time necessary to undertake this activity. Nurses in practice need to be reminded of their professional obligation to ensure that patients understand the surgical event, and are providing informed consent for the surgery. Only when this is achieved
are nurses responding to patient-focused learning needs and acting as true patient advocates.

Some of the recent surgical delays have been blamed on nursing shortages. Nursing as a profession has a responsibility to recognize this problem and to work to avoid practice related delays where possible. As previously noted, surgical delays add additional stress to the already chronically ill patient.

The fact that many participants were not "rational" in terms of their pre-operative expectations lends credence to the need for routine, nursing administered, pre-admission clinics. This service, which includes an explanation of the various routines and a tour of the various units, may help to allay anxiety, and assist with the transition to "in hospital" status. Women who are large breasted could be informed at this time that breast support of some type will be required while in hospital.

The health care team needs to make every effort to ensure that discharge planning is instituted from the moment the patient arrives in hospital. The participants in this study have clearly stated that they prefer to have their learning needs addressed well before leaving the hospital. Specifically, they stated that discharge planning should be centred around symptom management and activities of daily living. This includes fatigue, loss of mobility, pain and
medication management, loss of appetite, post-operative complications and incision care, valve related issues, emotional adjustment, the resumption of sexual activity and the need for support at home.

Advance notice of the hospital discharge is required by both patients and family members in order to make the requisite arrangements for going home. Informing patients of average length of hospital stay (6-8 days), the usual criteria for discharge (such as walking 2 flights of stairs, normal heart rhythm, resolving shortness of breath), and the general discharge process (unescorted walk with paperwork and valuables completed at the point of exit) would provide patients with a general guideline for estimating their own discharge date. It would also assist in creating realistic expectations for the discharge day itself.

Those nurses who undertake patient education must be made consciously aware that their perspective pertaining to the learning needs of patients with heart valve replacements differ from those of the patient. Nurses must complete thorough patient assessments in order to identify what patients perceive as important knowledge, as well as the individual's preference for the timing and method of teaching. However, it must also be acknowledged that the uninitiated patient will not be aware of all that they need to know. It is the educator's responsibility to recognize this and assist the patient where
needed. This will ultimately benefit patients and assist them in regaining their independence.

The results of the study suggest that patients continue to have learning needs, but that they are not aware of the nurses' role in meeting these various needs. Less than half of the subjects were confident in according the bedside nurse the role of educator. Consequently nurses in practice need to make patients aware of their role as educators. They also need to develop more autonomy. Deference to medical opinion should not be automatic.

Implications for Further Research

This study examined the learning needs for first time heart valve recipients and these have been identified. It would be significant to discover if patients who undergo repeat heart valve surgery encountered the same issues post-operatively, or if they were better able to manage because of their previous experiences. In order to validate the results of the study, replication, the "cornerstone" of research, is also recommended.

This study did not incorporate a specific cultural, ethnic or gender focus. It was evident that people from various cultures and of varying ethnic influence reacted differently to the process, and that some preferred the discharge teaching to be done in different ways. Therefore, it would be interesting
to study learning needs and how they are met using a cultural framework. Doing so may provide information related to specific cultural learning needs. For instance, once could investigate the cultural and ethnic influences surrounding the expression of pain.

A study relating to the learning needs that women have seems invaluable because this study revealed that women do have different learning needs during early recovery. Historically, women and cardiac illness have been poorly investigated despite the increasing incidence of cardiac disease in women (Statistics Canada, 1992).

Because eight participants discussed the angiogram, it was evident that this was an important part of the illness diagnostic process. Ethical research pertaining to the process of providing informed consent for the angiogram and the surgery itself is required. The results from the study suggest that patients did not feel adequately informed about their choices during these processes, nor were they well informed about the valve types and the potential complications inherent.

Practising nurses should be surveyed to discover who they believe should be undertaking discharge teaching. Some patients reported that their nurses deferred to the physicians, while others clearly stated that the nurses provided them with most of the requisite information. This discrepancy suggests that nurses hold varying perceptions pertaining to who should
be the patient's primary educator. This role requires clarification for all parties concerned, the patient, the nurse and the physician.

The timing of patient education requires further clarification. It is clearly documented in this study that follow up once home was not deemed necessary and that there is time in hospital when it can be done prior to the day of discharge. It would be of interest to many health care professionals if patients were specifically asked where they would prefer to be taught, in hospital or at home, and if so when.

Implications for Health Care Professionals

Many professions are involved in the process of cardiac surgery. Consequently some implications for other health care professionals were gathered from the research.

Knowing that surgical delays cause anxiety for patients, the surgeons have a responsibility to provide the patient with a reasonable estimate for the date of surgery. As previously noted, this may help alleviate waiting time stress and anxiety.

The family physician's role in patient education requires follow up. They have a unique opportunity to discuss a variety of issues with the convalescing patient. It is not known if nursing could play a role in the process of patient education during this time, but it warrants further investigation.
Many participants discussed the lack of direct benefit derived from the in-hospital physiotherapy classes. Consequently, the physiotherapists need to reassess the content, objectives and methods of timing and delivery of their classes. This study has shown that heart valve replacement patients have unique learning needs, and not all participants believed these were adequately addressed during physiotherapy.

Summary

This chapter has presented the conclusions to be derived from the results presented. It also addressed the implications these have for nursing practice, education, research and other health care professions.

To conclude, this study's findings suggest that heart valve replacement patients have unique learning needs. These learning needs must be assessed, along with when and how the patient learns best prior to "teaching" the patient. Doing so will assist in addressing needs, provide reassurance, and promote healthy living with a chronic illness.


Hammermeister, K., Sethi, G., Henderson, W., Oprian, C., Kim,


Appendix A

Information Letter to Potential Participants

(UBC Letterhead was used for all appendices)
Dear Sir/Madam

My name is Andrew Lesperance. I am a Registered Nurse and student in the Master of Nursing Science program at the University of British Columbia. I am currently conducting a research study for my thesis. Patients such as yourself who have recently undergone heart valve surgery are being asked to participate. Would you be interested in helping me find out what patients feel they need to learn about after having had a heart valve replaced? I wish to interview people four to ten weeks after they have been discharged from hospital.

If you are interested and willing to participate, this is what you can expect:

- A telephone call from myself, Andrew Lesperance, in order to arrange a convenient time for the interview.

- An interview conducted in your home at a time of your convenience, lasting approximately one hour. This interview will be tape recorded.

- The interview will consist of a series of questions designed to ask you about what things you feel you needed to learn about to help you recover from your heart valve surgery.

- At the end of the interview, a few questions regarding background information will be asked, such as date of surgery and type of valve implanted.

At any point in the interview you may decide to have the tape turned off or portions of it erased.

Your name will not be used, and you will not be identified in any way in the results.

There is the possibility of the need for a second interview lasting approximately 15 or 20 minutes. This would only happen if there was a need to clarify some of the information previously provided. If this is required, you will be contacted by telephone.

All the information collected will be destroyed after it has been analyzed.
You will also have the opportunity to ask me questions regarding your recovery and I will endeavour to assist you where possible.

You have the right to refuse to participate in this study and your refusal will in no way affect your present or future medical or nursing care.

If you are willing to participate, please provide your name and phone number on the sheet provided, and give this to the physician or office assistant (if you are at your doctor's office) or the assistant head nurse (if you are in hospital). I will contact you by telephone over the next few days to arrange a suitable time for an interview.

Thank you for your time,

Andrew Lesperance RN, BSN, Phone: 224-3214

Carol Jillings PhD, Research Supervisor, Phone: 822-7479
Associate Professor
UBC School of Nursing
Heart Valve Replacement Patients'
Perceptions of Their Learning Needs
Four to Ten Weeks after Hospital Discharge

By providing my name and phone number, I am giving permission to Andrew Lesperance to contact me by telephone to discuss participation in this research study.

Name: _______________________

Telephone Number: _______________
Appendix B

Consent Form for the Research
Heart Valve Replacement Patients' Perceptions of Their Learning Needs Four to Ten Weeks after Hospital Discharge

Consent Form

By providing my signature I am consenting to participate in a study whose purpose is to identify what heart valve replacement patients feel they need to know after heart surgery in order to better manage recovery at home.

The study, its purpose and what is expected of me have been fully explained to me. I understand that I may ask any questions I choose which are relevant to the study. I realize that I am free to withdraw from the study at any time and am under no obligation to complete this form. I have been told that failure to participate in this study would in no way jeopardize my present or future nursing or medical care.

I further agree that Andrew Lesperance is allowed to visit with me in my home at a mutually convenient time, in order to conduct the required one hour interview. I understand that the interview will be tape recorded and that the tapes will be erased when the study is concluded. I also understand that I may request to have the tape turned off or any part of it erased at any point during the interview. I understand that there is some demographic information required such as the type of valve I had implanted, the date of my surgery, my age and level of education. I also understand that a second interview lasting no more than 15 to 20 minutes may be requested in order to clarify the responses provided.

I have been informed that my identity will be kept confidential, although portions of the transcribed interview may be shared with the researcher's supervisors. Any identifying data such as my name will be omitted prior to the sharing of such information.
All my questions pertaining to the study have been answered by Andrew Lesperance. I have received a copy of the letter of information and the consent form. I have been informed that if I choose, I may obtain a summary of the results at the conclusion of the study, and give permission to Andrew Lesperance to mail this to me.

Name:______________________          Date:______________

Witness: ____________________       Date:______________

Researcher: Andrew Lesperance RN, BSN          Phone: 224-3214
UBC School of Nursing

Supervisor: Carol Jillings PHD          Phone: 822-7479
Associate Professor
UBC School of Nursing
Appendix C

Learning Needs Interview Guide
Heart Valve Replacement Patients' Perceptions of Their Learning Needs Four to Ten Weeks after Hospital Discharge

Learning Needs Interview Guide

Opening Statement:

People who have had heart surgery similar to yours experience many different issues after surgery. While caring for patients nurses have tried to determine what sort of help or knowledge patients with heart valve replacements will need once they are discharged home. More and more we realize that the patient is the one who can best provide this information and that is what my study is about. I am interested in your perspective regarding what you feel you've needed to know about since the time of your hospital discharge in order to assist in your recovery. Now that you have been home for several weeks:

1a) Describe for me what subjects or issues you feel you've needed to learn about in order to help with your daily activities and recovery?

b) When did you first notice that you needed to find out about (XXX)?

c) I'd like to know how you went about finding out what you needed to know about (XXX)? (Who, what sources, where?)

d) I'm interested in knowing if information regarding (XXX) was provided to you before being discharged from the hospital and if it was adequate?

2) I'd like to hear about what other subjects or issues you feel you've needed to learn or get information about in order to help with today's activities and recovery? (Questions 1.(b) to (d) will then be repeated.)
Interview Guide

Tell me what you've needed to know about or other people have discussed the need for information and education pertaining to:

1. Breathing/Respiration (Splinting, coughing, pain)
   Topic discussed ___
   When noted that info was needed__________________________

2. Diet/Nutrition (changes, appetite, weight loss/gain)
   Topic discussed ___
   When noted that info was needed__________________________

3. Elimination/Bowel function
   Topic discussed ___
   When noted that info was needed__________________________

4. Activity/Posture
   Topic discussed ___
   When noted that info was needed__________________________

5. Rest and Sleep (pain and its' effects)
   Topic discussed ___
   When noted that info was needed__________________________

6. Clothing/Dressing/Undressing
   Topic discussed ___
   When noted that info was needed__________________________

7. Body Temperature
   Topic discussed ___
   When noted that info was needed__________________________
8. Integument (Care of incision, wound)
   Topic discussed
   When noted that info was needed

9. Adapting to the environment (safety, cleaning, laundry, stairs, tub, valve clicking)
   Topic discussed
   When noted that info was needed

10. Emotions/Communications (mood swings, depression, anxiety, sexual activity)
    Topic discussed
    When noted that info was needed

11. Religious and spiritual needs
    Topic discussed
    When noted that info was needed

12. Work/Productive Occupation
    Topic discussed
    When noted that info was needed

13. Recreational Activities (driving, flying, travel)
    Topic discussed
    When noted that info was needed

14. Learning about disease/illness, medications, rehab
    (prophylactic antibiotics, valve clicking, pregnancy and meds)
    Topic discussed
    When noted that info was needed
3) These days patient education can happen in many ways. What do you think is the best way for you and other patients like yourself to be provided with education and information related to recovering from open heart surgery?

4) Describe for me when it would have been most beneficial for you to receive patient education and information pertaining to your recovery?

5) Whom do you believe should be providing this information? This can be more than one person.

6) Please feel free to provide any other information you feel would be helpful.

Demographic information to be asked at the end of the interview.

1. Age: __________

2. What type of valve did you have implanted during your surgery: Mechanical ___  Porcine (Pig) ___

3. Can you tell me what grade you completed in school?

4. Date of Surgery: _________________

5. Date of Discharge: _________________

6. Please feel free to provide any other information you feel would be helpful.
Appendix D

Information Letter to the Surgeons
Dear Dr.

My name is Andrew Lesperance and I am a Registered Nurse in the Master of Science in Nursing program at the University of British Columbia. I am conducting a research study for my thesis, that seeks to determine the learning needs of heart valve replacement patients four to ten weeks after hospital discharge. With the present trend toward early discharge of patients from hospital, the need for post operative patient education is essential.

I would like to access and interview twenty heart valve replacement patients from the Vancouver Hospital and Health Sciences Centre for this study. Because some of the potential participants will be your patients, your permission to approach the patient is presently being sought.

Potential candidates will have undergone their first heart valve replacement without bypass. They must speak English and reside in the Greater Vancouver Area. They must also provide their consent to participate in the study.

In addition, I would like to recruit potential participants from your office at the time of their follow up visit. This would require having your office assistant (or yourself) asking patients if they are willing to participate, as well as providing them with a letter of information (provided by myself) which details the purpose and conditions of the study. When patients agree to participate, they will place their name and number on a sheet provided and remit this to your office. I will collect these periodically. There is no additional commitment on your part.

If you have any questions regarding this study, I may be reached at home at 224-3214.
Consent:

I, the undersigned, consent to my patients who have had valve replacement surgery being approached while in hospital to request their participation in this study.

Signature:_______________ Date:__________

I further consent to patients being recruited from my office at the time of their six week follow up visit.

Signature:_______________ Date:__________

Thanking you in advance for your assistance

Andrew Lesperance RN, BSN Phone: 224-3214

Carol Jillings PHD Phone: 822-7479
Research Supervisor
Associate Professor
UBC School of Nursing
Appendix E

Intermediary Information Sheet
We have a Masters Student with the UBC School of Nursing who is looking to interview people for his masters thesis. He is wanting to find out what things heart valve replacement patients feel they need to learn about in order to recover from surgery.

If you are over 25, fluent in English, living in the Lower Mainland, have had a heart valve implanted for the first time and willing to participate in this study, I will provide you with an information letter from Andrew Lesperance which provides greater detail about the study. If you like, we can review this letter together, or I will leave it with you to read.
Appendix F
Demographics Tables
### Table I

**Age Ranges**

<table>
<thead>
<tr>
<th>Age</th>
<th>Females</th>
<th>Males</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-35</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>36-45</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>46-55</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>56-65</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>66-75</td>
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<td>3</td>
<td>6</td>
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<tr>
<td>76+</td>
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<td>1</td>
<td>2</td>
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</tbody>
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### Table II

**Surgical Replacement**

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<th>Valve</th>
<th>Females</th>
<th>Males</th>
<th>Total</th>
</tr>
</thead>
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<tr>
<td>Aortic</td>
<td>3</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Mitral</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Combination</td>
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<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

### Table III

**Education**

<table>
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<th>Level</th>
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<th>Males</th>
<th>Total</th>
</tr>
</thead>
<tbody>
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<td>To Grade 8</td>
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<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Grade 9-12</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>College/University</td>
<td>4</td>
<td>3</td>
<td>7</td>
</tr>
</tbody>
</table>