EMOTIONAL RECOVERY

IN MALE PATIENTS AND THEIR WIVES

THREE MONTHS AFTER MYOCARDIAL INFARCTION

by

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THREE MONTHS AFTER MYOCARDIAL INFARCTION

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DIANA E. CLARKE

A Thesis submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements of the degree of

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ABSTRACT

The emotional and psychological impact of a myocardial infarction (MI) can extend far beyond the physiological damage to the cardiovascular system. Both the patient and his family must learn to live with a chronic, life-style altering illness and also with the uncertainty of future sudden death. This study examined psychological and emotional sequelae to an MI as experienced both by the patient and the wife and the impact of those factors on the patient's psychological and functional recovery three months after the MI. The subjects were 52 male patients who had suffered a first MI and their wives. They were interviewed and completed questionnaires 4 to 6 days post-MI and again 3 months later.

It was found that higher patients' distress levels at the time of the MI predicted patients' anxiety and depression scores 3 months later. Wives' anxiety and depression scores at the time of the MI were also predictive of their anxiety and depression scores 3 months later. Patients' perceptions of their wives' overprotectiveness were measured 3 months post-MI using the Influential Relationships Questionnaire. Higher levels of perceived overprotectiveness at 3 months after the MI were correlated with wives' predictions of the patients' 3 month functional abilities and by the patients' satisfaction with family functioning both measured while the patient was still in the hospital. Patients who perceived a high degree of overprotectiveness from their wives reported higher depression scores, more perceived criticism from their wives, and a poorer quality of life three months after the MI. The perception of overprotectiveness was not found to be related to the wives' anxiety levels as had been predicted.

The Psychosocial Adaptation to Illness Scale, a measure indicating

quality-of-life, was also predicted by patients' and wives' predictions of 3 month functional ability and patients' distress, both measured while the patient was still in hospital. Three month correlates of quality-of-life were patients' depression scores, anxiety scores, and self-efficacy scores. Also correlating with patients' quality-of-life were wives' anxiety scores and wives' estimates of patients' functioning. Patients who reported poorer quality-of-life were less satisfied with their family's functioning.

The only variables found to correlate with cardiac functional capacity at 3 months were patients' self-efficacy and wives' estimates of function. No variables measured at the time of the MI were found to predict 3 month cardiac functioning.

EMOTIONAL RECOVERY IN MALE PATIENTS AND THEIR WIVES
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The diagnosis of a life-threatening illness presents a family with a crisis. Families, depending upon their resources, experiences, and dynamics, adopt different ways of coping with and adapting to such a crisis. When the life-threatening illness is myocardial infarction (MI), both the individual and the family are faced with the uncertainty of, at best, life with a chronic illness to, at worst, the possibility of future sudden death. Thus, an MI can have a tremendous emotional impact on both the individual and the family, quite apart from the physiological problems and consequent life-style adjustments that are required (Hackett & Cassem, 1973). This investigation examined emotional responses to the MI in both the patient and the wife and the relationship between these responses and the recovery and adaptation process.

MYOCARDIAL INFARCTION -- THE EVENT

A myocardial infarction (MI) is defined as the deprivation of the blood supply (ischemia) to the heart for a period of time sufficient to produce structural damage to the heart muscle (Karliner & Gregoratis, 1983). Because MI can cause functional or electrical conduction problems that interfere with the efficient pumping action of the heart, it is a life-threatening event (Karliner & Gregoratis, 1983). The principle cause of MI is occlusion of one or more major vessels of the heart muscle (myocardium) by arteriosclerotic plaques. The development of these plaques is associated with coronary artery disease (CAD).

Both physiological and psychological risk factors can predispose an

individual to the development of coronary artery disease. Some physiological variables, such as smoking, are totally within the individual's realm of control while others, such as age and family history of cardiac disease, may be completely outside of it. Yet others, such as presence of diabetes mellitus and hypertension may be amenable to treatment, thus modifying the risk.

A number of psychological risk factors are also associated with the development of CAD. Stress and life changes have been shown to correlate with CAD even when conventional, physical risk factors are controlled (e.g., Krantz, Baum, & Singer, 1983; Orth-Gomar & Ahlbom, 1980; Rosengren, Tibblin, & Wilhelmson, 1991; Syme, 1975). It has also been suggested that an imminent MI can be predicted based on an individual's reaction to stressful situations (Appels & Mulder, 1984). The Type A Behavior Pattern (TABP), a concept based on the findings of two large scale epidemiologic studies in the United States (American Heart Association [AHA], 1981; Brand et al., 1976), also appears to be associated with a higher risk of CAD.

Research evidence for the role of social isolation (or conversely a lack of social support) in the etiology of cardiovascular disease has resulted in the American Heart Association (AHA, 1987) adding this to its list of psychosocial risk factors. In an examination of psychosocial risk factors in heart disease, Cooper, Faragher, Bray, and Ramsdale (1985) found that reports of MI, positive EKG evidence of MI and hypertensive history correlated with low social support scores. In a similar vein, Ruberman, Weinblatt, Goldberg, and Chaudhary (1984) found that social isolation independently and significantly contributed to risk of death over three years post-MI. Seeman and Syme (1987) further found that both the lack of emotional support and

instrumental aid correlated highly with the incidence of CAD in both males and females.

Acute myocardial infarction

For some individuals, the occurrence of an acute infarction may be the first indication of CAD. For others, it may have been foreshadowed by the symptoms of transient ischemia (angina pectoris) (Williams & Wallace, 1983). Symptoms of acute MI usually include severe, crushing chest pain, shortness of breath, nausea, and diaphoresis (Karliner & Gregoratis, 1983). Differential diagnosis includes other diseases of the heart and lungs as well as of the gastrointestinal system (Karliner & Gregoratis, 1983).

Diagnosis of acute MI begins with a clinical history of chest pain not relieved by nitroglycerin. Typically, abnormalities in electrical conductivity as seen on electrocardiogram (EKG) and serum enzymes which change in response to muscle damange are considered diagnostic while angiography, an invasive x-ray procedure, helps determine the degree of vascular blockage.

The death rate of individuals suffering acute MI is as high as 20-25% with most deaths occurring within the first two hours after onset of symptoms (Karliner & Gregoratis, 1983). Survival is dependent upon the duration of the obstruction and the number of recurrent infarcts within a short period of time, the severity of the obstruction, the degree of collateral vascularization available, and the myocardial oxygen demand at the time of occlusion (Pepine, 1989).

The Peel Index (Peel, Semple, Wang, & Dall, 1962) was developed as a prognostic index for grading the severity of infarction and estimating the likelihood of mortality resulting from the MI. On the basis of scores

assigned to the patient in the categories of sex and age, previous cardiac history, shock, degree of heart failure, and EKG changes, an overall probability of mortality could be determined (Appendix J).

Physical recovery

Coronary artery disease is not reversible and is considered a chronic illness. Therefore, the notion of recovery is not one of cure, but rather one of successful adaptation and symptom management. Medical treatment revolves around drug therapy and includes the use of vasodilators, calcium-channel blockers, and anticoagulants (Arensberg, 1981; Bennett, 1981). Treatment also emphasizes the importance of physical activity (Wenger, 1981) although its benefits in terms of mortality and morbidity have not been demonstrated (e.g., Blumenthal & Levenson, 1987; Kavanaugh, Chisholm, Querski, & Kennedy, 1979; Rechnitzel, Pickard, Paivis, Yuhasz, & Cunningham, 1972). Finally, when symptoms are not adequately controlled by medical means, surgical intervention such as coronary artery bypass grafting (CABG) may be necessary (Hindle & Wallace, 1983).

Physical recovery is most commonly measured along two dimensions: physiologic recovery and functional recovery. Within both these dimensions are a number of both subjective and objective measures of varying validity and reliability.

Physical measures

Physiologically, there are there are a number of indicators of myocardial recovery. The first is the monitoring of EKG which shows changes in the electrical conductivity of the myocardium resulting from the presence of electrically inert scar tissue. Secondly, left ventricular ejection fraction

(LVEF) refers to the amount of blood pumped out of the left ventricle with each heart beat (Bigger et al., 1984). When the heart muscle has been damaged, the muscle wall will move in an abnormal fashion and thus will not pump as efficiently. Research has shown that LVEF as determined by angiography is the most powerful physiological predictor of reduced survival post-MI (Hammerstein, Timothy, & Dodge, 1979; Pfeffer & Braunwald, 1990).

Subjectively, patients' report of angina and frequency of use of antianginal medications is often used as an indicator of whether or not myocardial ischemia is occurring. However, subjective reports have not always been found to be a reliable measure of ischemia. For example, Costa, Zonderman, Engel, Baile, and Brinker (1985) showed that reports of chest pain correlated more strongly with the patients' neuroticism scores than with objective evidence of CAD. Chest pain indistinguishable from angina has also been reported in patients with panic disorder but with no evidence of coronary artery disease (Beck, Berisford, Taegtmeyer, & Bennett, 1990). Other researchers studying coronary heart disease patients have shown that, unless a behavioural analysis of antecedents and consequences of chest pain was carefully done, reports of pain made in the physician's office were usually overestimated (Engel, Baile, Costa, Brimlow, & Brinker, 1985). Conversely, patients who practised denial post-MI were found to report less angina during hospitalization than those who used less denial as a coping mechanism (Levenson, Mishra, Hamer, & Hastillo, 1989; Levine, Warrenberg, Kerns, & Schwartz, 1987). Finally, potentially dangerous ischemia has, in many cases, been found to be asymptomatic ("silent ischemia": Freeman, Nixon, Sallabank, & Reavely, 1987). Thus, report of angina may give the physician much valuable information but its absence should not be used alone as a reliable indicator

of recovery.

<u>Functional measures</u>

Metabolic equivalencies (METs) are used to describe resting oxygen intake and are an overall measure of cardiovascular endurance and physical work capacity (Naughton & Haider, 1973). One MET is equivalent to the metabolic cost to the body at rest (Blumenthal & McCubbin, 1987). Function is typically measured by the individual's performance on a graded treadmill or a bicycle ergometer. Post-MI, an individual with an uncomplicated MI should typically have a performance capacity of five to eight METs which, with good recovery and regular exercise, should increase to upwards of nine to ten METs within one year (Naughton, 1973).

Use of METs is frequently recommended to clinicians as an indicator of individual functional capacity (e.g., Teo & Kappagoda, 1984; Wagner & Williams, 1983) and has been shown to provide evidence of improvement in exercise tolerance on an individual basis (e.g., Clarke, 1989; Ewart, Taylor, Reese, & DeBusk, 1983; Rovario, Holmes, & Holmsten, 1984). METs for cardiac patients are based on results of symptom-limited testing and there are a number of reasons, other than cardiac, why the patient may choose to terminate the test. Symptoms such as shortness of breath, leg cramps, fear of angina, and fear of reinfarction may lead to early termination while a sense of competitiveness (commonly found in Type A individuals) may result in a patient prolonging the test past a tolerable or, in some cases, safe point (AHA, 1972). Thus, while serial treadmill tests will indicate improvement in individual functional capacity, so many factors can influence MET levels that they alone may not be a sufficiently pure or sensitive measure upon which to base measurement of recovery.

A psychosocial measure often used in research as an objective functional indicator of recovery is return to work (e.g., Degre-Coustry & Grevisse, 1983; Jenkins et al., 1983; Smith & O'Rourke, 1988; Trelawny-Ross & Russell, 1989; Winefield & Cormack, 1986). Although a number of patients are prevented from resuming employment because of persistent physical disabilities such as unstable angina or dangerous arrhythmias (Smith & O'Rourke, 1988), there are many psychological factors that will also influence the decision to return to work. For example, Wishnie, Hackett, and Cassem (1971) found, in their study of 24 post-MI patients, that 9 of the 11 who did not return to work, did so for primarily psychological reasons. Anxiety (Havik & Maeland, 1990; Wishnie et al., 1971), level of education (Bar-On & Cristal, 1987; Maeland & Havik, 1987; Smith & O'Rourke, 1988), a sense of control over fate (Garrity, 1973) and type of work performed (Naughton, 1978) have all been shown to influence the rate of return to work. Additionally, it has been argued that, although a patient may have returned to work, that statistic alone says nothing about how the patient feels about or is coping with that return to work (Levine & Croog, 1984). Thus, it can be argued that return to work is not so much a measure of physiological recovery as it is measure of psychosocial adaptation. Indeed, in a review of the literature, psychiatric disorders, particularly affective disorders, have been found to be better predictors of return to work than physical symptoms (Shanfield, 1990).

A number of scales have been developed that base a measure of recovery on the patient's ability to perform activities of daily living and whether or not that changes between evaluations. Because they measure the impact of disease on the patient, they bear many similarities to quality of life scales. Thus, functional classification measures make the transition between purely physical

and psychosocial recovery.

Two scales that measure functional ability directly through a series of questions are the Karnofsky Performance Status Scale (Karnofsky, Abelmann, Craver, & Burchenal, 1948; Mor, Laliberte, Morris, & Wiemann, 1984), originally developed for use with cancer patients, and the Specific Activity Scale for assessing cardiovascular functional class (Goldman et al., 1981). The Specific Activity Scale is based on the metabolic equivalency requirements of activities commonly included in routine assessments of cardiac patients and has been found to address satisfactorily the short-comings of the earlier cardiac functional classifications (Goldman et al., 1981; Kazis, 1991). Recent research using the Karnofsky Scale with MI patients has shown it to be as effective as LVEF and exercise test performance in the prediction of subsequent mortality rates (Brezinski, Stone, Muller, Tofler, Davis, Parker et al., 1991).

PSYCHOLOGICAL SEQUELAE TO MI

The Patient

Authors writing about emotional reactions to MI based on clinical observations (e.g., Blumenthal & Mau, 1983; Cassem & Hackett, 1973; Doehrman, 1977; Havik & Maeland, 1990; Johnston, 1985; Tessar & Hackett, 1985) consistently describe a typical course that begins when the patient is still in the coronary care unit (CCU). The patient immediately experiences a period of intense anxiety related to the life-threatening severity of the situation. As most deaths from MI occur within the first 24 hours, this is an understandable and realistic source of anxiety and fear.

Once the immediate period of life-threatening crisis is over by the

second day in the CCU, many patients employ their own brand of anxiety management -- the denial that anything serious has happened (Cassem & Hackett, 1973). Part of this is a natural reaction after the crisis. The clinical picture shows a patient whose pain has subsided, who states that he is feeling better, and who suggests that perhaps the doctors made a mistake in diagnosis. This denial can be very beneficial in the short-term, leading to faster mobilization and initial recovery (Stern, Pascale, & Ackerman, 1977). If persistent, however, it can create long-term difficulties in the areas of treatment compliance and risk factor modification (Bar-On, 1985; Hackett & Cassem, 1973; Tessar & Hackett, 1985).

Anxiety can be a more persistent problem for some patients, however. Kutz, Garb, and David (1988) found that 15% of a sample of post-MI patients exhibited chronic symptoms of post traumatic stress disorder (PTSD) one year post-MI while a futher 5-10% of patients suffered from an acute form of PTSD which subsided within the first year.

Depression is estimated to be present to a greater or lesser degree in almost all patients post-MI and may, for some, persist for a period lasting from weeks to years (Doehrman, 1977; Hackett & Cassem, 1973). The major reason postulated for the onset of depression is the abrupt return to reality after the period of denial that occurred while the patient was feeling reasonably well in hospital. Hackett and Cassem (1973) described, based on clinical impressions, a "homecoming depression" that results from feelings of extreme fatigue and exhaustion that can occur after an activity that previously require minimal effort. At this point, the MI patient may begin to question whether or not he is getting better or if he'll ever be able to return to his former level of functioning or resume his former roles. This

can be especially distressing to a Type A individual who will react adversely to his perceived lack of control over life events. Outbursts of anger related to extreme frustration are not uncommon.

Thus, much of the depression that occurs after an MI takes the form of what was formerly referred to as exogenous or reactive depression (Hackett & Cassem, 1973) resulting from a clearly identifiable external stimulus. In some ways, the early depression approximates a grief reaction to the loss of health (Havik & Maeland, 1990; Hackett & Cassem, 1973) and is consistent with the Diagnostic and Statistical Manual-III Revised (DSM-III-R) diagnosis of uncomplicated bereavement (American Psychiatric Association [APA], 1987). As with the diagnosis of bereavement however, morbid preoccupation with worthlessness and marked functional impairment of a prolonged duration can lead to a diagnosis of a major depressive episode (APA, 1987). Lloyd and Cawley (1978) suggest that a significant number of patients who show depressive symptoms (especially those who become depressed early after the MI) may have had a premorbid depression and accompanying psychopathology.

The occurrence of psychological distress in the post-MI patient is of clinical concern because a number of studies have demonstrated a relationship between distress and poor outcome. Patients reporting high levels of stress as measured in hospital by a self-report questionnaire (General Health Questionnaire) and receiving routine post-MI care were found by Frasure-Smith (1991) to experience a three-fold increase in MI recurrence and mortality over 5 years. In this study, highly stressed patients did not differ in severity of cardiac disease from less stressed patients. Fontana, Kerns, Rosenberg, and Colonese (1989) found that patients experiencing depression reported more cardiac symptoms three months post-MI, while Coombs, Roberts, Crist, and

Miller (1989) showed similar results 12 months post-MI. Using structured clinical interviews to diagnose depression, Carney, Rich, Freedland, Saini, TeVelde, Simeone, and Clark (1988) found that major depressive disorder was the best predictor of major cardiac events in patients with CAD as determined by angiography. Similarly, Silverstone (1987) found that patients who had a "poor" outcome after MI (i.e., those who died, had a cardiac arrest or a further infarction) were more likely to have been diagnosed as significantly depressed within 48 hours post-MI. Further, a meta-analysis of studies examining the relationship between CAD and depression concluded that there was a significant association between the two (Friedman & Booth-Kewley, 1987).

The patient's premorbid personality and coping skills have been shown to be the best indicators of whether or not the patient will have psychological difficulties in adjusting to the chronicity of cardiovascular disease (Mayou, 1984; Wicklund, Sanne, Vedin, & Wilhelmsson, 1984). Furthermore, it can be determined early in the course of hospitalization which patients will have difficulty adjusting (Blumenthal, 1985; Mayou, 1984; Stern et al., 1977). Havik and Maeland (1990) identified two groups of patients "at risk" for long-term emotional difficulties. One group experienced a high level of anxiety throughout hospitalization while the second group experienced a sudden, sharp increase in reported distress immediately post-discharge. In an earlier study, Stern, Pascale, and Ackerman (1977) also found that patients who were depressed early in recovery were more likely to remain depressed during a one year follow-up and were determined to have poor psychosocial adjustment.

A mediating factor between coping and distress may be the degree of uncertainty related to one's condition. Christman, McConnell, Pfeiffer,

Webster, Schmidt, and Reis (1988) found that patients who expressed a high degree of uncertainty also reported high emotional distress. Uncertainty was also determined to be a factor influencing distress in Havik and Maeland's (1990) subjects. In an effort to explain this relationship in patients with chronic illnesses, Braden (1990) examined the hypothesis that patients who worked actively to reduce uncertainty were less dependent and had a better quality of life. She found strong relationships between enabling skill, self-help, and life quality. In support of this, the Christman et al. (1988) study also showed that coping behaviours correlated negatively with distress.

A final factor that may be operative in depression post-MI is pharmacotherapy the patient may be receiving. Some drugs commonly used in the control of hypertension and angina (e.g., beta-adrenergic blockers such as propranolol) have a side-effect of biochemically-induced depression (Canadian Pharmaceutical Association, 1990) and should be considered in a psychiatric assessment.

<u>Quality of life</u>

Because the therapeutic goals of CAD treatment focus on controlling rather than curing the disease process, there is an increasing emphasis in the current literature on the importance of measuring "quality of life" when examining variables of treatment efficacy and recovery post-myocardial infarction (Fletcher, Hunt, & Bulpitt, 1987; Kaplan, 1988; Kazis, 1991; Spitzer, 1987; Wenger, Mattson, Furberg, & Elinson, 1984; Wenger, 1990).

It is generally agreed that the concept of quality of life incorporates three basic components: physical functioning or physiologic state, mental and emotional status, and social functioning (Aaronson, 1989; Kazis, 1991; Levine & Croog, 1984; Spitzer, 1987; Ware, 1984; Wenger et al., 1984), components

that Spitzer (1987) describes as "clinically relevant human attributes" (p. 465). When the effects of an illness on quality of life are being examined, the focus becomes the degree to which that illness influences "normal" or satisfactory functioning (Kaplan, 1988). Most importantly, the evaluation of this functioning should be from the patient's point-of-view (McCullough, 1984; Wenger, 1990), what Huber, Henrich, and Herschbach (1988) refer to as "the relevant reality of the patient" (p. 453). The patient's perceptions and expectations not only frequently differ from the objective observations of the clinician, but they have been shown to be better predictors of mortality risk especially in elderly subjects (Wenger, 1990). Pragmatically, for the clinician and the researcher then, the question is not "how much can the patient do?" but instead becomes "is that an acceptable or satisfactory level for the patient?"

Measurement of Quality of Life

The major debate surrounding quality of life research is concerned with how the concept is operationalized. It is generally well-accepted that separate scales for ostensibly healthy persons on the one hand and definitely ill persons on the other are necessary (Aaronson, 1989; Huber et al., 1988; Spitzer, 1987). Factors contributing to quality of life at opposite ends of the health-illness continuum are very different and must be measured using different criteria (Spitzer, 1987). Scales measuring quality of life in healthy populations examine such factors as material well-being, personal growth, and altruistic behaviour (e.g., Evans & Cope, 1989). In individuals with chronic illness, however, while some of these factors maintain their importance, the nature of the disease process, severity of symptoms, and the patient's perception of the future all distract from the joy of living and

need to be considered when assessing overall quality of life (Taylor, 1987).

There are two major approaches to the development of quality of life scales in research. The first is what is referred to as the "relative frequency" or "psychometric" approach. In this type of instrument, separate measures for the many dimensions of quality of life are provided (Kaplan, 1988). Using the popular "Sickness Impact Profile" (SIP; Bergner, Bobbit, Carter, & Gilson, 1982) as an example, activities that are likely to be affected by the illness are listed. Subjects indicate whether or not they can perform that activity. The total importance of variables is measured according to their frequency, not according to their desirability (Bush, 1984). Opponents of the psychometric method argue that it fails to consider that different health problems are not of equal concern: "one hundred runny noses are not the same as 100 severe abdominal bleeds" (Bush, 1984; Kaplan, 1988, p. 383). Despite arguments against this approach, however, the most psychometrically-sound, "finely tuned" (Spitzer, 1987, p. 469) measurement tools available for researchers today are of this type (e.g., SIP, Index of Well-Being Scale, Psychological Adaptation to Illness Scale, RAND General Health Perceptions Scale).

The second approach to measurement is a "decision theory" or "standardized preference" approach (Bush, 1984; Kaplan, 1988). According to Bush (1984), this approach takes into consideration the following factors: the actual occurrence of an event/attribute, the relative desirability of that event/attribute, the probability of that event/attribute occurring, and the expected utility of the event given its probability. The result is a single number, an index that provides a "single unitary expression of health status...an overall desirability aggregate" (Kaplan, 1988, p. 383).

A final consideration concerns the relative utility of the two approaches. The decision theory approach may give an overall indication of whether or not a therapy or treatment has made a significant difference. However, it gives no indication of the reasons for suboptimal quality of life and thus, no indication of where intervention may be required.

Whether or not scales measuring quality of life in ill persons can be "generic" or whether they need to be illness-specific is also a matter for debate. For example, are separate scales for persons with cardiac disease, bowel disease, arthritis, et cetera, necessary or can a scale for general deviations from physical health be sufficiently sensitive? Proponents of disease-specific scales argue that different clinical disorders present great variations in quality of life concerns (Wenger et al., 1984). For example, pain for an arthritis patient carries with it the fear of progressing disability while pain for a cancer patient may signal metastatic disease and the possibility of impending death.

Finally, there is conflicting evidence as to whether self-report or interviewer-administered tests of quality of life are more reliable. Bergner et al. (1981) found somewhat higher reliability for the SIP when administered by an interviewer than when mail-delivered and self-administered. Part of this was related to a higher response rate for the interviewer-administered method. Bush (1984) further argued that self-administered questionnaires run the risk of missing many reports of dysfunction resulting in an under-reporting. Other authors, however, have found self-administered questionnaires to be more reliable than those administered by interviewers (Storstein, 1987). Differences in interviewing styles and training procedures for interviewers may account for inconsistencies in research findings.

Generally, reviews of the literature in the area have recommended that practical issues such as ease of administration, cost, and the potential for multiple testing periods within the course of a study give self-administered questionnaires the advantage over those that are interviewer-administered (Aaronson, 1989; Wenger et al., 1984).

Self-efficacy

Self-efficacy is the feeling that one has some control over various parts of one's life and the confidence to successfully perform needed activities and tasks (Bandura, 1982). Bandura, a social learning theorist, proposed the notion that post-MI patients may lack self-efficacy in their physical capabilities to resume their customary pre-morbid activities because of limitations imposed on them early in their course of illness (Bandura, 1982). Indeed, a measure of self-efficacy developed for use with cardiac patients has been shown to correlate positively with measures of functional capacity such as METs (Clarke, 1989; Ewart, Taylor, Reese, & DeBusk, 1983; Taylor, Bandura, Ewart, Miller, & DeBusk, 1985). An analagous concept of "mastery" has also been shown to be inversely related to psychological distress post-MI (Ben-Sira & Eliezer, 1990).

Self-efficacy has been shown to improve with intervention. Ewart et al. (1983) examined patients' confidence in their physical abilities before and after performing on a symptom-limited treadmill test. Patients whose tests were stopped for non-cardiac reasons (i.e., they did not experience angina or arrhythmias) demonstrated an increase in confidence after the test for activities simjlar to treadmill walking. While Taylor et al. (1985) found that perceptions of self-efficacy proved to be significant predictors of performance on subsequent treadmill tests in the absence of intervention,

Clarke (1989) demonstrated that, with regular participation in a cardiac rehabilitation program, self-efficacy estimates increased proportionately with functional capacity.

Bandura theorized that spouses can be very influential in development of patients' self-efficacy (1982). In support of this, Clarke (1989) found that wives' estimates of patients' abilities correlated strongly with both patients' own perceptions of self-efficacy and with functional capacity early in the recovery process. Taylor et al. (1985) involved wives in treadmill testing to varying degrees. One group of wives observed their husbands on the treadmill, another group walked on the treadmill, and a third group did not participate in the treadmill testing. The wives had also completed efficacy ratings on their husbands' abilities before and after testing. The findings indicated that the wives who walked on the treadmill themselves increased their ratings of their husbands' abilities to a level comparable to those of their husbands', while the other two groups demonstrated no such increase.

Psychosocial intervention

Studies examining interventions designed to alleviate psychological distress in the post-MI patient have been equivocal. In examining the efficacy of group psychotherapy, neither Adsett and Bruhn (1968) nor Ibrahim, Feldman, Sultz, Staiman, Young, and Dean (1974) found significant differences on measures of psychological well-being between patients who received psychotherapy and those who didn't. On the other hand, Stern, Gorman, and Kaslow (1983) found that subjects who received group counselling experienced a decrease in depressive symptomatology as did subjects who underwent a course of exercise therapy when compared to a control group that received no

intervention. Of concern when conducting group therapy or counselling with post-MI patients, is the observation that these individuals are not psychiatric patients and do not want to be treated as such (Adsett & Bruhn, 1968; Blanchard & Miller, 1977; Ibrahim et al., 1974). Inconsistencies in the focus and content of group therapy or group support in addition to differences in the styles of individual group facilitators and differences in patients' perceptions of and reactions to the therapy may account for differences in empirical findings and make replication of these studies difficult.

Dispelling patients' fears and anxiety with accurate information is frequently considered therapeutic (e.g., Frasure-Smith & Prince, 1985; Thompson & Meddis, 1990a). Following an attempt to provide psychological follow-up for the patients who reported high stress in hospital, Frasure-Smith (1991) reported a three-fold increase in risk of mortality over five years for those subjects who received no follow-up as compared with subjects who received follow-up. Thus, differentiating between studies evaluating individual therapy and education is difficult and can also account for the differences in research findings. For example, Thompson and Meddis (1990a) found that patients who received in-hospital counselling and education reported significantly less anxiety and depression for up to 6 months post-MI than patients who received "routine" care alone. Similar results were reported by Oldenburg, Perkins, and Andrews (1985) who found that subjects receiving post-discharge education and/or counselling experienced better psychological functioning than subjects in exercise programs and subjects receiving no intervention. Mayou, Sleight, MacMahon, and Florencio (1981), however, found no differences on psychological measures between subjects

receiving educational intervention and subjects in exercise groups. Further contradictory evidence was provided by Miller, Wikoff, Garrett, McMahon, and Smith (1990). They found that, 2 years after a structured in-hospital educational program, subjects who received instruction were less likely to be compliant with treatment regimen than subjects who received no formal instruction.

A variable that is very difficult to control in experimental or quasiexperimental research is the amount of education the patient receives from nurses and physicians while in hospital being given what is described as "routine" care. Indeed, what Thompson and Meddis (1990a) describe as their "experimental treatment" is considered routine and minimum criteria for acceptable nursing practice (Canadian Council of Cardiovascular Nurses, 1983), calling into question the ethics of having an untreated control group.

The family

The family is considered to be the primary societal unit and is generally expected to be able to provide support to its members throughout the life-span. When an individual is diagnosed as having a chronic or life-threatening illness, that diagnosis affects not only the patient, but also the family system. Wright and Leahey (1987) visualize the diagnosis of a life-threatening illness as a social contract into which all members of the family enter along with the patient. The "demands of illness" (Haberman, Packard, & Woods, 1985) have the potential to create a crisis that may alter family functioning in general and may lead to disorganization or, in some extreme cases, disintegration of the family system (McCubbin & McCubbin, 1987b; Wright & Leahey, 1987). While the life-threatening illness has a

tremendous impact on the family, the converse is also true. The family can have an impact on the course of the illness (Wright & Leahey, 1987). The degree to which families adjust to changed expectations of each other, the beliefs the family holds about the illness, and the amount of control they feel they may have over the outcome of the illness can all influence how they and the patient will cope (Woods, Yates, & Primomo, 1989; Wright & Leahey, 1987).

The spouse and family of the MI patient are faced, not only with their own feelings of shock, grief, and anxiety (e.g., Adsett & Bruhn, 1968; Skelton & Dominian, 1973), but also with the societal expectation that they be the primary providers of support to the patient (Daltroy & Godin, 1989; Sirles & Selleck, 1989). This can present the spouse and family with a challenge which they may or may not be able to meet.

Immediately post-MI, while the patient is still in hospital, the spouse's focus of coping has been shown to be primarily illness-related (Nyamathi, 1987). As with the patient, grief and anxiety are the primary emotions at this time (Langeluddecke, Tennant, Fulcher, Barid, & Hughes, 1989; Michela, 1987; Nyamathi, 1987; Skelton & Dominian, 1973) with the highest levels of anxiety found, understandably, in wives who perceived their husbands as sicker (Waltz, Badura, Pfaff, & Schott, 1988). Indeed, Michela (1987) reported, albeit retrospectively, that in most instances, the wives admitted to higher levels of anxiety than the patients themselves. In a sample consisting 80% of female spouses, younger spouses reported more emotional distress as measured by feelings of depression, irritability, and anger than older spouses (Nyamathi, Jacoby, Constancia, & Ruvevich, 1992). Furthermore, emotional distress was significantly related to what the authors described as "emotion-

focused" coping (Nyamathi et al., 1992).

While the patient's anxiety has been reported to abate and be replaced by depression, the literature generally reports, based on interviews and clinical impressions, that the wives continue to experience anxiety which, in some cases, increases in intensity (Michela, 1987; Skelton & Dominian, 1973). There are two hypothesized reasons for this anxiety which have been investigated. The first is the fear and uncertainty associated with the diagnosis (Bramwell & Whall, 1986; Christman et al., 1988; Croog, 1983; Langeluddecke et al., 1989). All of these studies found a strongly positive relationship between the degree of uncertainty regarding the future and the reported emotional distress experienced by the spouse at multiple testing periods up to 1 year post-MI.

The second reason posited for the wives' anxiety is the reported sense of responsibility they feel for their husbands' survival and well-being and the intense pressure that this creates (Adsett & Bruhn, 1968; Bramwell & Whall, 1986; Gilliss, 1984; Nyamathi, 1987). Some of this sense of responsibility may emanate from feelings of guilt surrounding the development of CAD and the infarction episode as observed by Adsett and Bruhn (1968). Other authors report a perceived need on the part of the wives to "protect (the patient) from trying to do too much too soon" thereby risking reinfarction (Bramwell & Whall, 1986, p. 284; Croog & Levine, 1977; Gilliss, 1984; Rankin & Gilliss, 1987; Wicklund, Sanne, Vedin, & Wilhelmsson, 1984a). There is some evidence to suggest that, when the MI patient is the wife, the husbands may even been more prone towards overprotectiveness (Stern et al., 1977) although this has not been followed up with further research, possibly due to the lower numbers of female MI patients.

As with the patient's psychological recovery, the family's ability to cope in a crisis often depends on its premorbid level of functioning and previous history of coping with crises. Positive family attributes which seem to be consistent across developmental stages include open communication, satisfaction with roles, personal compatibility, a shared sense of family values and activities, and opportunities for social exchange outside the family (McCubbin & McCubbin, 1987; Woods et al., 1989).

Families who do not function in an adaptive way, whether on a daily basis or in times of crisis, have been extensively studied in the literature. Minuchin, Rosman, and Baker (1978) have used the term "dysfunctional families" to denote these families with problematic coping. They have described these families as having three principle characteristics: enmeshment and blurring of individual boundaries, overprotectiveness of the family unit and of individual members, and rigidity in crisis management.

Enmeshment is described by Minuchin et al. (1978) as an extreme form of proximity and overinvolvement amongst family members. In such a dysfunctional system, ego boundaries are poorly defined and easily crossed. The individual gets "lost in the system" (Minuchin et al., 1978, p, 30; Wood, Watkins, Boyle, Noguira, Zimand, & Carrol, 1989).

A concept that goes hand-in-hand with enmeshment is overprotectiveness. Minuchin et al. (1978) describe overprotective families as having a high degree of concern for both the individual members' welfare as well as the welfare of the family as an entity. This high degree of concern, however, is considered dysfunctional because it can retard development of autonomy and competence and discourage interests or activities "outside the safety of the family" (Minuchin et al., 1978, p. 31). In situations where there is an

illness in the family, the overprotectiveness is not necessarily limited to the illness nor is it necessarily directed towards the patient. Frequently the patient may feel a need to reciprocally protect the family, particularly if there is a family-related psychosomatic component to the illness (Minuchin et al., 1978).

Overprotectiveness in families of patients with cardiovascular disease has been extensively described in qualitative and exploratory studies. Although Wicklund et al. (1984) presented some evidence that a degree of overprotectiveness in the family may lead to a prolongation of the sick-role post-MI, there is a paucity of empirical investigation concerning the possible influence of overprotectiveness on physical and psychological recovery post-MI (Bramwell, 1990). Most authors who have reported overprotectiveness have speculated or assumed that it is harmful and will prevent normal resumption of pre-morbid activities and responsibilities (e.g., Bandura, 1982; Nyamathi, 1987) but have provided only theoretical reasoning. Other authors have provided anecdotal evidence of psychological distress on the part of individual patients (e.g., "...wife's worries...make me feel worthless"; Kaufman, Pasacreta, Cheney, & Arcuni, 1985-6, p. 377).

To date, the literature consists of mainly descriptive and qualitative studies. Very few studies have been conducted that attempt to provide intervention for the spouses' concerns. When intervention has been provided, the outcome measures have been mainly concerned with the effect on the MI patient and not necessarily on the spouse (e.g., Adsett & Bruhn, 1968). One recent study (Thompson & Meddis, 1990b) included spouses in patient teaching and support post-MI. They demonstrated that the wives who had been included reported significantly less anxiety concerning various aspects of the

patients' lives (e.g., recurrence of MI, expectations of the future, relations with the patient) for a period of up to 6 months compared with wives who had not been included. Although this study provided some empirical evidence that intervention with wives is helpful, more studies regarding the emotional functioning of spouses post-MI are needed.

Some research has been conducted examining the effect that an MI can have on a marriage. Generally, it has been concluded that in healthy, functional marriages an MI has little detrimental effect on the marital dyad and, in some cases, may result in some improvement in the relationship (Badger, 1990; Croog & Levine, 1977; Michela, 1987). For example, Michela (1987) found that couples whose marriages were satisfying pre-morbidly reported more intimacy (not necessarily sexual) and enhanced appreciation of each other post-MI.

Important components of successful marital adjustment to chronic illness are flexibility and collaboration in terms of role reallocation, family decision-making, and mutual communication (Ben-Zira & Eliezer, 1990; Bramwell, 1990). Ben-Zira and Eliezer (1990) referred to spousal support as a "primary environmental resource" for the patient and visualized the spouse's role as enhancing and facilitating access to support rather than as primarily a provider. According to Bramwell (1990), couples who were seen as collaborative were found to be able to accept the illness, its limitations, and consequent changes in lifestyle. They were willing to make a commitment to the relationship and work at its success but were also able to take a periodic respite from illness-related work. Collaborating couples maintained open communication and were willing to provide support to each other. In Bramwell's words, the couples "saw themselves as facing the chronic illness together" (p. 8).

The focus of marital conflict may be issues such as roles and responsibility within the family. Depending partly on the degree of disability experienced by the patient post-MI, previously-held roles and responsibilities may no longer be available, resulting in issues of control. For example, with an anxious, overprotective wife, the MI patient may feel a loss of control over his health (Nyamathi, 1987). He may feel he is not only prevented from doing things for himself, but is physically unable to do them, thus creating a "vicious circle" of lowered self-esteem and self-efficacy (Bandura, 1982). Clarke (1989) provided some evidence for this with the finding that patients whose wives accompanied them to rehabilitation classes expressed lower self-efficacy. The direction of causality, (i.e., whether the wives accompanied their husbands because they had low self-efficacy or whether the wives' attention resulted in lowered self-efficacy), however, could not be determined.

On the other hand, the patient may attempt to reassert himself in an attempt to gain or regain control. Support for this was provided in a study evaluating the effects of education on treatment compliance. Dracup, Meleis, Clark, Clayburn, Shields, and Staley (1984) found that patients who participated in the educational sessions without their wives actually became more compliant with treatment regimens than those who attended with their wives.

HYPOTHESES

After myocardial infarction, the patient and his family face a period of recovery and adaptation to life with a chronic illness. This descriptive, correlational study examined the emotional responses to the MI at the time of

the MI and 3 months later. Furthermore, the relationship between overprotectiveness and long-term recovery was examined within the context of the patient's actual functional abilities, perception of being overprotected, and the degree of psychological distress experienced by the patient. It was also necessary to consider the spouse's degree of emotional distress within the context of overall family functioning.

1. A number of variables at T1 were hypothesized to be predictive of the perception of overprotectiveness at T2. It was hypothesized that:

a. Patients whose wives experience more anxiety at T1 would report higher levels of perceived overprotectiveness at T2.

b. Patients whose wives gave lower prediction of their husbands' functioning at T1 would perceive themselves as being overprotected at T2.

c. Ratings of family functioning as reported by both the patient and the wife at T1 would be correlated with the patient's perception of being overprotected at T2.

2. It was also predicted that a number of T2 variables would correlate with the patient's sense of being overprotected at T2.

a. Patients who perceived themselves as being overprotected at T2 would experience a lower level of family functioning as reported by both themselves and their wives at T2.

b. Patients who perceived themselves as being overprotected at T2 would report higher levels of depression and lower prediction of function at T2.

c. Patients who perceived themselves as being overprotected at T2 would demonstrate a lower cardiac functional capacity at T2.

d. Patients who perceived themselves as being overprotected at T2 would report a lower quality of life at T2.

3. It was predicted that a number of variables measured in hospital (T1) would be related to the outcome measures quality of life and cardiac functional capacity 3 months after the MI (T2). It was hypothesized that:

a. Lower quality of life at T2 would be predicted by lower prediction of function (self-efficacy) by the patient and higher anxiety and lower prediction of the patient's function by the wife at T1.

b. Lower cardiac functional capacity at T2 would be predicted by lower prediction of function by the patient and lower prediction of function by the wife at T1.

METHODS

Subjects

The subjects were 52 male patients suffering a first MI admitted to either St. Boniface General Hospital, Grace General Hospial, Victoria General Hospital, or Health Sciences Centre and their wives. Only male patients were recruited into the study as most males experience MIs more frequently and at an earlier age than females and the pattern of interpersonal dynamics between females MI patients and male spouses could not be assumed to be the same as those between male patients and female spouses. Futhermore, recent research suggests that the pathophysiology of MI may be different in males and females (Cochrane, 1992). Subjects were included in the study if they had suffered a first MI, were married or living in a common-law relationship, were fluent in English, younger than 70 years of age, and had no other major illnesses that would make participation difficult. For example, one patient who had invasive cancer was excluded. Patients who had pending coronary artery bypass grafting were also excluded. Patients who had bypass surgery after being enrolled in the study were terminated from the study at that point. Three subjects were excluded from follow-up for this reason although their in-hospital data were included in the analysis. Informed consent was obtained from all participants (see Appendix A and B).

Subjects enrolled in the study ranged in age from 28 to 70. All but one couple were legally married. The one unmarried couple was engaged and had been living together. At the time of the MI, 37 subjects were employed, 12 were retired, and two were on disability. One subject had become unemployed just prior to the MI.

All subjects met the criteria for a diagnosis of myocardial infarction:

displaced QT segments and ST elevation on electrocardiogram and typical

abnormalities found on serial examination of enzymes creatinine phosphokinase,

lactate dehydrogenase, and serum glutamic oxaloacetic transaminase. For 43

subjects the MI was the first documented cardiac event, while the remainder

had previously experienced angina or other non-specific cardiac symptoms. One

subject required resuscitation because he experienced cardiac arrest after

reaching hospital. Peel indices for the patients ranged from 1 to 13 with a

mean of 5.6 $\pm$ 3.3. Because the Peel index considers age, not surprisingly

older patients received significantly higher Peels (r=.38, p=.007). Of

interest, 22 subjects were smokers prior to the MI with a further five former

smokers.

Thirteen potential subjects who were approached regarding participation

refused outright. A common reason for refusal was feelings of being

"overwhelmed" and unable to cope with anything more. Two of these men denied

having had heart attacks and discharged themselves against medical advice.

Patient who refused ranged in age from 31 to 62 and were assigned Peel Indices

of 4 to 18 with a mean of 6, not significantly different from the study group.

Distress scores ranged from 4 to 9, with a mean of 5.6, somewhat higher than

the mean for the study group which was 3.9 $\pm$ 2.0.

Procedure

The schedule of the administration of psychological measures can be found

in Table 1. All measures are described in detail in the next section. Data

collection was initiated while the patient was still in hospital at a mean of

5 days post-MI. Subsequent data collection was at 3 months after the MI. The

rationale for the choice of this time was that by 3 months the crisis of MI

could be considered to be over for most patients and they were well into the

process of psychological reintegration and adaptation (Donaldson, McCorkle, Georgiadou, & Benoliel, 1986).

MI patients. Upon recruitment into the study, subjects were given an information sheet which explained the details of the study and a copy of their signed Consent Form. While still in hospital (T1), they completed the Family APGAR. They were also asked to predict, using a self-efficacy scale for cardiac patients, what they believed their functional capacity may be in 3 months. A 15 to 20 minute semi-structured interview designed to obtain qualitative data about the patients' level of psychological distress was also performed (Appendix C). Ratings of the subjects' levels of anxiety and depression were subsequently provided by the interviewer.

At 3 months after discharge from hospital (T2), subjects were telephoned at home and interviewed briefly by the investigator. Many life-style issues introduced in the hospital interview such as changes in exercise patterns, success with smoking cessation, and success with dietary changes were discussed. The Specific Activity Scale, a determination of the subject's functional status, was also completed over the telephone. Subsequent to this, follow-up questionnaire packages were mailed to subjects and their wives. These packages included: the Influential Relationships Questionnaire (IRQ), the family APGAR, the self-efficacy scale, the Zung anxiety and depression inventories, and the Psychological Adaptation to Illness Scale (PAIS).

Wives. While the patient was still in hospital, the wives or partners were asked to complete the Zung inventories, the APGAR, and a prediction of their husbands' functional capacity in three months using the same scale as completed by the husbands. The same procedure for administration of the questionnaire packages was followed.

Table 1

Temporal sequencing of psychological and physical measurements

MEASURE	TIME	
Patient:	In-hospital (T1)	3 months (T2)
Overprotectiveness (IRQ)		x
Family function (APGAR)	x	x
Prediction of function (Self-efficacy)	x	x
Anxiety (Zung scale)		x
Depression (Zung scale)		x
Cardiac function (Specific Activity Scale)		x
Cardiac damage (Peel Index)	x	
Quality of Life (PAIS)		x
Spouse:		
Family function (APGAR)	x	x
Anxiety (Zung scale)	x	x
Depression (Zung scale)	x	x
Prediction of husband's functional capacity	x	x

Psychological, functional, and physical measures

Influential Relationships Questionnaire (IRQ)

The IRQ (Baker, Helmes, & Kazarian, 1984) is a 34 item scale designed to measure perceived interpersonal characteristics of care, overprotection, and criticism in families of schizophrenics (see Appendix D). The IRQ consists of three sub-scales -- a 12 item criticism scale, an 11 item scale measuring the amount of caring in the relationship, and an 11 item overprotectiveness scale. For each item, the respondents indicate whether the item describes an activity or attribute that is "very like" to "very unlike" (on a four point scale) their experience in relation to the most influential person in their lives. For this study, the designated person was the spouse. Internal consistency of the scale has been found to range from .77 on the criticism scale to .87 on the overprotectiveness scale (Kazarian, Baker, & Helmes, 1987). A study by Baker et al. (1984) found moderate test-retest reliability ranging from .53 on the overprotectiveness subscale to .78 on the criticism subscale. Norms have been established for schizophrenic and depressed psychiatric populations, as well as for non-clinical Canadian and Australian populations (Baker et al., 1984; Kazarian & Baker, 1987; Parker, Tupling, & Brown, 1979). A score of 12 was used as an indication of clinical significance as 12 was just outside the upper range one standard deviation from the mean and there was a natural cut-off at 12 in the bimodal distribution of the responses for this subject population.

Self-efficacy (Prediction of function)

The prediction of cardiac functional capacity and ability at T1 and at T2 was measured using the self-efficacy scale devised for cardiac patients (Bandura, 1982; Taylor et al., 1985). It consists of 12 subscales each of

which describe different levels of abilities to perform common activities that may stress the heart (see Appendix E). Subscales include seven measures of physical ability, four measures of ability to withstand emotional stressors, and a rating of cardiac capability (heart rate). The scales are scored by averaging the summed confidence levels of each task. For each activity, the participant rates, on a 100 point scale, how likely he feels he is to perform that activity -- from very uncertain (0) to completely certain (100). The wives were asked to rate how likely they felt their husbands were to perform that activity. While in hospital, the scale was used as a predictor of future functioning, asking both patients and wives how confident they were that the patient would be able to perform the activities three months post-MI. Self-efficacy estimates on all subscales have not been found to change with repeated testing in the absence of intervention (Ewart et al., 1983; Taylor et al., 1985).

Family APGAR

The family APGAR (see Appendix F), an acronym for Adaptability, Partnership, Growth, Affection, Resolve, is a brief clinical questionnaire that samples these five major dimensions of family functioning (McCubbin & McCubbin, 1987a; Smilkstein, 1978). It consists of five closed-ended questions to which the respondent answers either "always", "sometimes" or "never'. It was designed to be used as a screening test to give a rapid overview of family functioning in primary care settings. A score of seven to ten suggests a highly functional family, four to six suggests a moderately dysfunctional family, while a score of zero to three suggests a severely dysfunctional family (Smilkstein, 1978).

Concurrent validity has been demonstrated between the family APGAR and

other psychometric measures of family functioning as well as with clinical evaluations of family functioning by therapists in both clinical and nonclinical populations (Good, Smilkstein, Good, Shaffer, & Arons, 1979). Interspouse correlation in the Good et al. (1979) study was found to be .67.

Specific Activity Scale

The Specific Activity Scale (see Appendix G) was developed to assess the degree of functional cardiovascular disability within and across patients (Goldman et al., 1981). It consists of five main categories of questions based on activities of daily living and their corresponding metabolic equivalency (MET) levels. The patient answers "yes" or "no" to each question and is placed in Class I through IV depending on the numbers of "yes" responses in each category. A difference of 1 is deemed to have clinical significance (Goldman et al., 1985).

The Specific Activity Scale has been compared with more traditional functional classification systems such as the New York Heart Association Scale (NYHA, 1979) and the Canadian Cardiovascular Society Scale (Campeau, 1975). In comparison to these scales, it has been found to demonstrate stability across repeated measurements (73%) and correlates well with treadmill performance (.68). It has been found to be equally valid whether administered by a trained cardiologist or by an individual untrained in patient interviewing techniques (Goldman et al., 1981).

Psychosocial Adaptation to Illness Scale

The Psychosocial Adaptation to Illness Scale Self-Report (PAIS-SR: Derogatis & Derogatis, 1990) is a "relative frequency" (Kaplan, 1988) measure of quality of life for individuals personally affected by illness. It is a 46 item scale that examines psychosocial adjustment to illness in seven primary

domains of illness functioning: Health Care Orientation, Vocational Environment, Domestic Environment, Sexual Relationships, Extended Family Relationships, Social Environment, and Psychological Distress (see Appendix H). Its intent is to facilitate identification of "...patients who might benefit from increased attention to the psychosocial elements of their illnesses" (Derogatis et al., 1990, p. 33). A four-point scale of distress (0-3) is used for each item with scale direction alternated on even numbered items to reduce position response biases (Derogatis et al., 1990). For the purposes of this study, only six domains were examined. Health Care Orientation shows poor test-retest reliability for cardiac patients, is wordy and difficult to understand, and was of no relevance to the present study. Although the authors of the PAIS have suggested that a total score of 62 or above is positive for clinical levels of psychosocial maladjustment (Derogatis & Derogatis, 1990), a cut-off score of 50 was employed in this study after examining the distribution of the scores of this group of subjects.

Norms have been established for each subscale of the PAIS for subjects with a variety of illnesses including cardiac. Reliability coefficients of the various scales of the PAIS range from a low of .62 on the Extended Family subscale to a high of .85 for the Psychological Distress subscale using cardiac patients (Derogatis & Derogatis, 1990). The scale has been shown to correlate well with other instruments that measure quality of life in illness such as the Global Adjustment to Illness Scale and the SCL-90-R as well as with independent clinical ratings of patients' functioning. The Sexual functioning subscale has been shown to correlate well with both the Zung depression scale and the CES-D in predicting depression post-cardiac surgery (Folks, Baker, Freeman, Govier, Reves, & Sokol, 1988).

Zung Depression Scale

The Zung Self-rating Depression Scale is a 20 item scale (see Appendix I) originally designed to provide a simple assessment of psychiatrically defined depression (Zung, 1965). Symptoms commonly seen in a diagnosis of depression were matched with self-statements that the subject would rate on a four-point scale as present "A little of the time" to "Most of the time". The higher the score, the more likely was a diagnosis of depression (Zung, 1965). The Zung depression scale classifies non-depressed subjects as those achieving an index of less than .50, subjects with low to moderate levels of depression will achieve an index of .50-.59, subjects with moderate levels will score .60-.69, subjects with severe depression will score above .70 (Gabrys & Peters, 1985).

The scale has been found to be useful in identifying depression in a variety of age groups and a variety of cultures (Gabrys & Peters, 1985; Hickie & Snowdon, 1987; Kozeny, 1987; Zung & Zung, 1986). The scale correlates well with DSM-III-R diagnosis of depression (Griffin & Kogut, 1988), with clinician ratings (Schaefer et al., 1985), and with Beck Depression Inventory scores (Kerner & Jacobs, 1983; Schaefer et al., 1985).

Zung Anxiety Status Inventory (ASI)

The Anxiety Status Inventory (Appendix J) is a 20 item scale that rates subjects on 5 affective and 15 somatic symptoms of anxiety (Zung, 1971). As with the depression scale, it is rated on a four-point scale. The ASI is able to differentiate between subjects diagnosed as having an anxiety disorder and non-clinical subjects and correlates well with other accepted measures of anxiety such as the Taylor Manifest Anxiety Scale (Zung, 1971). The range of scores which indicate mild to moderate to severe levels of anxiety are identical with those in the Zung depression inventory (Zung, 1971).

Peel Prognostic Index

The Peel Prognostic Index (Peel et al., 1962) was developed as a tool to hdetermine the relative severity of a MI in terms of factors such as age, sex, previous history, degree and severity of shock, presence and severity of heart failure, cardiac rhythm, and the nature and extent of cardiographic signs (see Appendix K). The higher the score, the less likely was the patient to survive the 28 days following the infarct. Although the scale is 30 years old and the technology of critical cardiac care has advanced to a point where many more patients are surviving more severe infarcts, the index remains useful in establishing relative severity and has been found to predict recurrent cardiac events (Powell & Thoresen, 1985).

Data analysis

Statistical methods utilized in this study were primarily descriptive in nature and were employed to examine correlations between variables and combinations of variables. To evaluate appropriateness of tests, univariate analyses of variables for normality and homogeneity of variance were performed.

Relationships between variables were examined using Pearson's product moment correlation (r) where both variables were normally distributed. Where either one or both variables were non-normally distributed, as in the case of APGAR which was skewed to the high end of the satisfaction scale, the non-parametric Kendall's τ was used. To validate the presence of a truly linear relationship between significantly correlated variables, bivariate scatterplots were examined. All tests of significance for correlations were set at an alpha level of .05. Computer data analysis was performed using SAS,

Version 5 (SAS Institute, 1985) and Version 6 (SAS Institute, 1992).

Stepwise multiple regression was used to determine which variables were important indicators, which carried only a little information, and which were redundant with other variables (Younger, 1985). Where two variables were highly correlated, only the one with the most theoretical significance was tested in the regression equation. The significance level for entry of variables into the regression equation was set at the automatic SAS default of .15. For models which were found to explain a significant amount of variance, residual scatterplots were employed to check for errors of prediction.

Finally, cut-off points for the testing of clinical significance were determined using methods proposed by Jacobsen, Follette, and Revenstorf (1986) and Jacobsen, Wilson, and Tupper (1988). Mean scores sorted along lines of clinically significant differences on variables of interest are presented as illustrations. However, because of the increased possibility of Type II errors resulting from small numbers of subjects, t-test determinations of statistically significant differences are not presented.

RESULTS

Emotional recovery

<u>Patients</u>

Patients' distress levels in hospital were determined by the interviewer based on in-hospital interviews. Distress levels ranged from a low of 1 to a high of 9 out of 10 with a mean of 3.9 (Table 2).

Three months after the MI, 7 of 46 men (15%) had anxiety scores which exceeded the .50 level of clinically significant anxiety as determined by Zung (1975) with a further two on the borderline (i.e., scores of .48 or .49). Anxiety scores were found to correlate positively with distress ratings in hospital ($r=.31$, $p=.04$).

Eleven of 46 subjects (24%) had depression scores at T2 which exceeded .50 with a further three on the borderline. Depression scores also correlated with distress ratings in hospital ($r=.37$, $p=.02$). The mean of depression scores at .43 $\pm$ .11 (Table 3) was significantly outside the range of the mean for the non-clinical population as defined by Zung (1965). Anxiety scores and depression scores in patients were highly correlated ($r=.79$, $p=.0001$).

<u>Wives</u>

While their husbands were in hospital at the time of the MI, eleven of 52 wives (21%) had anxiety scores that exceeded .50 with four more on the borderline. At T2, ten of 48 wives (21%) scored above .50 with two more on the borderline. Five of these women had also scored above .50 at T1. T1 and T2 scores were found to be correlated ($r=.59$, $p=.0001$). Anxiety scores in wives at T2 were also correlated with anxiety scores in patients at T2 ($r=.79$, $p=.0001$).

Seventeen of 52 wives (33%) scored above .50 on the Zung Depression

Table 2

Descriptive statistics at T1

	Mean (S.D.)	Range
Patients:		
Age	54.5 (9.1)	28-70
Peel	5.6 (3.3)	1-13
APGAR	8.2 (2.1)	2-10
Distress	3.9 (2.0)	1-9
Prediction of function	61.5 (15.0)	21-87
Wives:		
APGAR	7.5 (2.6)	1-10
Anxiety	.42 (.11)	.25-.70
Depression	.46 (.11)	.25-.69
Prediction of function	57.9 (15.4)	25-84

Table 3

Descriptive statistics at T2

	Mean (S.D.)	Range
Patients:		
APGAR	8.2 (2.1)	0-10
Anxiety	.39 (.09)	.26-.55
Depression	.43 (.11)	.25-.69
Self-efficacy	68.0 (14.7)	19-86
Overprotectiveness	7.3 (5.9)	0-21
Criticism	7.6 (5.5)	0-18
Quality-of-life	44.6 (6.8)	34-67
Cardiac function	1.8 (0.9)	1-4
Wives:		
APGAR	7.0 (2.8)	0-10
Anxiety	.42 (.08)	.28-.60
Depression	.46 (.10)	.25-.68
Estimate of function	62.8 (14.6)	30-94

Scale at Tl with an additional seven on the borderline. At T2, sixteen of 48 (33%) scored above .50 with five on the borderline. Again, depression scores at T1 and T2 were correlated (r=.56, p=.0002). Anxiety scores were also correlated with depression scores both at T1 and T2 (Tables 4 & 5). Wives' and patients' depression scores were correlated at T2 (see Table 5).

Overprotectiveness

A major purpose of this study was to describe the phenemenon of overprotectiveness, to examine its psychological correlates for both the patient and the wife, and to determine if its appearance can be predicted. Wives' and patients' prediction of three month post-MI functioning made at T1, the Peel Index, wives' anxiety scores at T1, and patients' and wives' T1 APGAR scores were examined in an equation to predict perceived overprotectiveness. Wives' prediction of function and patients' APGAR scores were found to contribute significantly to the equation accounting for 38.8% of the variance (Table 2). Correlations between overprotectiveness and T1 variables can be seen in Table 4.

The regression to determine T2 correlates of perceived overprotectiveness employed the predictor variables of patients' depression, wives' anxiety, wives' estimates of function, patients' self-efficacy and the patients' perception of criticism. Neither patients' anxiety nor wives' depression scores were examined in the equation because patients' depression scores were strongly correlated with patients' anxiety scores (r=.79, p=.0001) and wives' anxiety scores were strongly correlated with wives' depression scores (r=.75, p=.0001). It was decided to include patients' depression because of the higher prevalence of clinically significant scores while wives'

Table 4

Correlation matrix for overprotectiveness and variables at T1

	OP	WP1	PP1	ANW1	APP1	APW1	PEEL	DIS
Overprotectiveness (OP)	1.0	-.54***	-.33*	.11	-.29**	-.11	-.14	.27
Wife's prediction of function (WP1)		1.0	.39**	-.13	-.10	-.18	.02	-.03
Patient's prediction of function (PP1)			1.0	.02	.07	-.16	-.17	-.02
Wife's anxiety (ANW1)				1.0	-.10	-.18	-.03	.11
Patient's APGAR (APP1)					1.0	.21	-.01	-.17
Wife's APGAR (APW1)						1.0	.09	-.14
Peel index (PEEL)							1.0	-.06
Patient's distress (DIS)								1.0

* Significant at p<.05
** Significant at p<.01
*** Significant at p<.001

Note: Nonparametric correlations (Kendall's τ) were used with APP1 and APW1 due to their skewed distributions. All others are Pearson product-moment correlations.

Table 5

Correlation matrix for overprotectiveness and variables at T2

	OP	WP2	PP2	ANW2	ANP2	CR	DEP2	APP2	APW2
Overprotectiveness (OP)	1.0	-.14	-.25	.12	.56***	.63***	.51***	-.33**	-.12
Wives' estimate of function (WP2)		1.0	-.40**	-.43**	-.35*	-.40**	-.36*	.04	.14
Patients' self-efficacy (PP2)			1.0	-.25	-.54***	-.28	-.48**	.23	.05
Wives' anxiety (ANW2)				1.0	.23*	.75***	.47**	-.18	-.25*
Patients' anxiety (ANP2)					1.0	.40**	.79***	-.18	-.09
Perceived criticism (CR)						1.0	.31*	-.43**	-.19
Patients' depression (DEP2)							1.0	-.26*	-.30**
Patients' APGAR (APP2)								1.0	.36**
Wives' APGAR (APW2)									1.0

* Significant at p<.05
** Significant at p<.01
*** Significant at p<.001

Note: Nonparametric correlations (Kendall's τ) were used with APP2 and APW2 due to their skewed distributions. All others are Pearson product-moment correlations.

Table 6

Stepwise regression for dependent variable overprotectiveness using

T1 variables

Variable:	D.F.	Partial R^2	Model R^2	Prob>F
Function est. (wife)	1,39	.2884	.2884	.0005
APGAR (patient)	2,38	.1000	.3884	.0017

No other variables met the significance level for entry into the
equation.

Table 7

Regression analysis for dependent variable overprotectiveness with T1

variables

Variable:	D.F.	Partial R^2	Model R^2	Prob>F
Criticism	1,39	.3949	.3949	.0001
Depression (Pt.)	2,38	.1110	.5059	.005

No other variables met the significance level for entry into the equation.

anxiety was employed because of its theoretical importance. Patients' anxiety scores and perceived criticism were the only variables to significantly contribute to the regression equation, accounted for 50.6% of the variance (Table 7). A correlation matrix of overprotectiveness with T2 variables can be seen in Table 5.

From these results, hypotheses regarding the perception of overprotectiveness were examined. First, it was predicted that patients whose wives gave lower predictions of their husbands' three month functional abilities would perceive themselves as being overprotected at T2. This hypothesis was supported. A high overprotectiveness score was correlated with lower predictions of function at T1 made by both patients and by wives. However, wives' estimates of function at T2 were not correlated with perceived overprotectiveness.

The second hypothesis stated that patients who perceived themselves as being overprotected at T2 would experience a lower level of family functioning as reported by themselves and their wives at T2. This hypothesis was partly supported in that patients with higher APGAR scores at T2 reported lower overprotectiveness scores ($r=-.33$, $p=.01$). However, there was no relationship between wives' APGAR scores and husbands' report of perceived overprotectiveness.

A third hypothesis speculated that patients who perceived themselves to be overprotected would report higher levels of depression. Overprotectiveness was found to be correlated with patients' depression at T2 ($r=.51$, $p=.006$). Overprotectiveness was also correlated with perceived criticism ($r=.55$, $p=.003$) and inversely correlated with caring ($r=-.46$, $p=.002$) as measured by the other two subscales of the IRQ.

Table 8

Means of T1 and T2 variables based on overprotectiveness scores

	Overprotectiveness score		
MEASURE	OP<12 n=35	OP>12 n=8	Overall n=43
T1 Patient variables:			
Distress	3.8 (1.9)	4.5 (2.5)	3.9 (2.0)
Age	54.7 (9.1)	53.3 (9.2)	54.5 (9.1)
Prediction of function	63.0 (15.3)	52.9 (10.6)	61.8 (15.0)
Peel	5.8 (3.3)	5.2 (3.5)	5.6 (3.3)
APGAR	8.4 (2.6)	6.9 (2.6)	8.2 (2.1)
T1 Wife variables:			
Anxiety	.41 (.10)	.46 (.12)	.42 (.11)
Depression	.46 (.11)	.49 (.10)	.46 (.11)
Prediction of function	60.9 (15.3)	43.1 (12.9)	57.9 (15.5)

(Continued)

Table 8 (Continued)

Overprotectiveness scores

MEASURE	OP<12 n=35	OP>12 n=8	Overall n=43
T2 Patient variables:			
Anxiety	.37 (.07)	.48 (.07)	.39 (.09)
Depression	.40 (.11)	.54 (.09)	.43 (.11)
Self-efficacy	70.1 (12.2)	59.6 (21.3)	68.0 (14.7)
Quality-of-Life	42.8 (5.4)	52.5 (6.7)	44.6 (6.8)
T2 Wife variables:			
Anxiety	.41 (.06)	.44 (.12)	.42 (.08)
Depression	.46 (.10)	.47 (.13)	.46 (.10)
Estimates of function	63.7 (13.6)	59.5 (18.2)	62.8 (14.7)

Note: Standard deviations are in parentheses

It was further hypothesized that patients whose wives experienced more anxiety at T1 would report higher levels of perceived overprotectiveness. Contrary to expectations, perceived overprotectiveness was not related to anxiety experienced by the wives at either T1 or T2. Partial correlations were examined to determine whether or not wives' anxiety may be a component of predictions of function. This was not found to be the case.

It was also predicted that patients who perceived themselves as being overprotected would report a poorer quality-of-life at T2. Overprotectiveness scores and quality-of-life scores were found to be significantly correlated (r=.60, p=.0001) thus supporting the hypothesis.

In an examination of clinically significant differences, patients' scores on variables of interest were sorted by those scoring high (>12) and low (<12) on the measure of overprotectiveness. These results can be seen in Table 8.

Quality of Life

Multiple regression analysis was performed to determine which T1 and T2 variables would predict problems with psychosocial adaptation (quality-of-life) 3 months post-MI. In a stepwise procedure (see Table 9) the T1 predictor variables age, Peel index, wives' prediction of function, wives' anxiety, patients' distress, and patients' prediction of function were tested. Wives' prediction of function and patients' distress were added to the equation as significant contributors accounting for 26.4% of the variance.

Multiple regression analysis of a model with quality-of-life as the dependent variable and the T2 variables of patients' self-efficacy, patients' depression and APGAR scores, wives' prediction of function, depression, and

APGAR scores as the predictor variables was then performed (see Table 10). As before, the variables patients' and wives' anxiety were not included due to their high correlation with patients' and wives' depression scores (Table 5). Patients' depression was by far the most significant contributor to the equation with 56% of the variance explained by that variable alone. Patients' self-efficacy was also found to be a significant contributor. In total, those variables accounted for 64.5% of the variance.

It was predicted that higher distress ratings and lower self-efficacy estimates by the patient and higher anxiety and lower prediction of the patient's function by the wife, all at T1, would predict a poorer quality-of-life 3 months post-MI. This hypothesis was supported as wives' prediction of function and patients' distress and patients' prediction of function were all correlated with quality-of-life. An illustration of differences between those scoring above the cut-off of a PAIS score of 50 and those scoring below 50 can be seen in Table 13.

Cardiac functional capacity

Subjects' cardiac recovery scores at follow-up showed a group that was generally recovering well. Twenty-two subjects were experiencing no limitation of their usual activities and thus were placed in the cardiac functional category of "1". A further 16 were in the category "2", experiencing some but minimal limitations. Eleven subjects were in category "3" or "4", moderate to severe limitation of functioning related to the cardiac condition. One of these subjects had suffered a reinfarction 6 weeks after the original event. A further two of these subjects had undergone additional angioplasties in an effort to treat recurrent, disabling angina.

Table 9

Stepwise regression for dependent variable quality-of-life with T1 variables

Variable:	D.F.	Partial R^2	Model R^2	Prob>F
Prediction (Pt.)	1,35	0.1668	0.1668	.01
Distress (Pt.)	2,34	0.0968	0.2636	.04

No other variables met the significance level for entry into the equation.

Table 10

Stepwise regression for dependent variable QOL with T2 variables

Variable:	D.F.	Partial R^2	Model R^2	Prob>F
Depression (Pt.)	1,39	0.5602	0.5602	.0001
Self-efficacy (Pt.)	2,37	0.0851	0.6452	.005

No other variable met the significance level for entry into the equation.

Table 11

Correlation matrix of quality-of-life with T1 variables

	QOL	WP1	DIS	PP1	PEEL	APP1	APW1	ANW1
Quality of Life (QOL)	1.0	-.39**	.39*	-.33*	-.01	.00	-.12	-.18
Wife's prediction of function(WP1)		1.0	-.03	.39**	.02	.13	.11	-.04
Patient's distress (DIS)			1.0	-.03	-.07	-.17	-.14	.07
Patient's prediction of function (PP1)				1.0	-.17	.07	-.17	.02
Peel index (PEEL)					1.0	-.01	.07	-.04
Patient's APGAR (APP1)						1.0	.21	-.10
Wife's APGAR (APW1)							1.0	-.18
Wife's anxiety (ANW1)								1.0

* Significant at p<.05
** Significant at p<.01
*** Significant at p<.001

Note: Nonparametric correlations (Kendall's τ) were used with APP1 and APW1 due to their skewed distributions. All others are Pearson product-moment correlations.

Table 12

Correlation matrix of quality-of-life with T2 variables

	QOL	ANW2	APP2	ANP2	SE2	WE2	DEP2	OP
Quality of Life (QOL)	1.0	-.39**	.39*	.79***	-.61***	-.46**	.74***	.60***
Wife's anxiety (ANW2)		1.0	-.08	.40**	-.25	-.43**	-.36*	.12
Patient's APGAR (APP2)			1.0	-.18	.23*	.04	-.26*	-.33**
Patient's anxiety (ANP2)				1.0	-.54**	-.35*	.78***	.56***
Patient's self-efficacy (SE2)					1.0	.40**	-.47**	-.25
Wife's estimate of function (WE2)						1.0	-.36**	-.14
Patient's depression (DEP2)							1.0	.51***
Oveprotectiveness (OP)								1.0

* Significant at p<.05
** Significant at p<.01
*** Significant at p<.001

Note: Nonparametric correlation (Kendall's τ) was used with APP2 due to its skewed distributions. All others are Pearson product-moment correlations.

Table 13

Means of T1 and T2 variables categorized by PAIS scores (Quality-of-Life)

Psychological Adaptation to Illness

MEASURE	PAIS score <50[a] n=34	PAIS score >50 n=8	Overall n=42
T1 Patient variables:			
Distress	3.7 (1.7)[b]	5.5 (2.9)	3.9 (2.0)
Age	54.8 (9.0)	54.0 (11.9)	54.5 (9.1)
Prediction of function	62.1 (15.6)	57.3 (13.4)	61.8 (15.0)
Peel index	5.6 (3.5)	6.2 (1.2)	5.6 (3.3)
T1 Wife variables:			
Anxiety	.41 (.10)	.42 (.09)	.42 (.11)
Depression	.46 (.10)	.42 (.12)	.46 (.11)
Prediction of function	59.6 (15.7)	51.0 (14.5)	57.9 (15.5)
T2 Patient variables:			
Anxiety	.36 (.06)	.54 (.02)	.39 (.09)
Depression	.40 (.09)	.60 (.08)	.43 (.11)
Self-efficacy	70.1 (11.9)	52.5 (21.7)	68.0 (14.7)
Overprotectiveness	5.5 (4.6)	14.2 (5.9)	7.2 (5.9)

(Continued)

Table 13 (Continued)

Psychological Adaptation to Illness

Measure	PAIS score <50[a] n=34	PAIS score ≥50 n=8	Overall n=42
T2 Wife variables:			
Anxiety	.41 (.08)	.46 (.10)	.42 (.08)
Depression	.44 (.05)	.49 (.13)	.46 (.10)
Estimates of function	65.6 (13.0)	49.7 (18.0)	62.8 (14.6)

[a] Note: Higher PAIS scores indicate more adaptational problems.

[b] Note: Standard deviations are listed in parentheses.

One of these, a man who was being assessed as a possible candidate for CABG, had two additional angioplasties each 6 weeks apart. He stated that he would begin to feel confident of recovery when he could go more than 6 weeks without a major cardiac event.

Due to the categorical nature of the Specific Activity Scale scores and the uneven distribution in the groups, subjects were divided into two categories -- those having no or minimal impairment (i.e., those in Functional Classification groups 1 and 2) and those having moderate to severe impairment (i.e., those in groups 3 and 4). Mean scores of variables of interest divided on that basis can be found in Table 14.

It was hypothesized that poorer cardiac functional capacity would be predicted by lower prediction of function by both the patient and by the wife at T1. This hypothesis was not supported by the data. Correlations between cardiac functional capacity and prediction of function at T1 by the patients and prediction of function at T1 by the wives were not significant (Table 14). Indeed, none of the T1 variables was correlated with cardiac functional capacity at T2. However, at T2 cardiac function was found to be significantly inversely correlated with patients' self-efficacy as well as with wives' estimation of function.

Table 14

Means of T1 and T2 variables based on Cardiac Function (CF) Scores

Category of cardiac functioning

MEASURE	no or minimal impairment n=38	moderate to severe impairment n=11	Correlation with cardiac functioning (τ)
T1 Patient variables:			
Distress	3.8 (1.9)	4.5 (2.5)	.06
Age	54.3 (8.5)	55.0 (11.4)	.09
Prediction of function	61.2 (15.5)	62.6 (13.9)	.02
Peel index	4.6 (1.7)	5.8 (3.5)	.14
T1 Wife variables:			
Anxiety	.41 (.11)	.46 (.12)	.10
Depression	.46 (.11)	.49 (.10)	.11
Prediction of function	58.3 (15.8)	56.6 (15.3)	-.03

(Continued)

Table 14 (Continued)

Category of cardiac functioning

MEASURE	no or minimal impairment n=38	moderate to severe impairment n=11	Correlation with cardiac functioning (τ)
T2 Patient variables:			
Anxiety	.38 (.08)	.43 (.08)	.24
Depression	.42 (.11)	.48 (.12)	.19
Self-efficacy	70.3 (12.9)	58.3 (19.0)	-.25*
Overprotectiveness	5.8 (6.8)	9.3 (6.3)	.15
Quality of Life	44.1 (5.8)	46.9 (10.1)	.10
T2 Wife variables:			
Anxiety	.41 (.08)	.44 (.05)	.20
Depression	.45 (.10)	.50 (.12)	.08
Estimates of function	67.7 (13.4)	51.0 (13.2)	-.32**

* Significant at p<.05
** Significant at p<.01

Note: Standard deviations are in parentheses.

Qualitative Data

Interviews with patients in hospital

All subjects were interviewed while in hospital or very shortly after discharge. Although it was preferred that the patient be alone during the interview, on a few occasions the patient's wife was present. In these situations, an attempt was made to see the patient alone at another time as well. Ten potential subjects consented to study participation and were interviewed but failed to return the questionnaires. Although there were no quantitative data for these men, their interview data will be included here.

Interview data was transcribed, coded, and analyzed for common themes. Although interview data was elicited by a number of semi-structured questions, there was sufficient freedom for the subject to talk about what was important to them at the time. Some subjects wanted very much to talk and answered all of the questions before they had even been asked! The first question asked patients to describe their emotions since the heart attack. Some patients described the actual event of the MI in great detail, including thoughts and emotions. A number of subjects admitted to marked relief when they arrived at the hospital stating "...I felt I was in good hands", "...I knew I was going to be all right." After the initial diagnosis though, many subjects described what some termed "an emotional roller coaster." Subjective anxiety seemed to increase with anticipation of tests (e.g., angiograms, exercise tests) and again with anticipation of the results. This anxiety was noted by the interviewer as well as being reported verbally by the patient. For example, if the patient was initially interviewed while waiting for a test or result, his affect was often noticeably changed when the interviewer would return to collect the questionnaires 24 to 48 hours later. Statements about

the loss of control over events in the hospital were not uncommon.

Ambivalent statements were common in almost all interviews. For example, one subject stated that he thought the doctors "made a mistake (in diagnosis)" but shortly thereafter was fighting tears while he talked about his pain and fear during the infarction. Yet another stated he was optimistic about a full recovery but that he was glad that he had sufficient insurance to care for his family should "anything happen." Although a majority of subjects denied thinking about death, a common response to being told that this study would follow them up in three months was "..if I'm still here in three months." For some subjects, there was incongruence between their statements and their behaviour. For example, some subjects who said they were feeling "fine" were visibly distressed and easily irritated while one who stated he was "...more depressed than (he's) ever been" was busy making plans for discharge and his vacation. A number of subjects also attempted to minimize the event stating "...(a heart attack) is not the end of the world these days."

The most daunting anticipated lifestyle changes were smoking cessation for the smokers and dietary changes for smokers and non-smokers alike. Quitting smoking was particularly troublesome for those who smoked in response to stress. One subject, a week after discharge, was caught in a vicious circle. He related to the investigator that he smoked to relieve the stress he felt from not smoking but would feel guilty and selfish and experience conflict situations with family members. This would leave him needing to smoke all the more.

A number of patients stated that they were concerned about how their family was going to cope with the heart attack. Financial concerns, conflict

with teen-age children, and other illnesses in the family (whether the spouse, a child, or a parent) were added burdens that the patients freely discussed.

Refusals and non-responders

Eleven patients who were approached regarding participation in the study refused to complete the questionnaires but did consent to be interviewed. The majority of this group made attributional statements about their MI. Three of these men were unemployed at the time of the MI and felt that their distress over this may have caused the MI. Others talked about stresses at work or in the family as a causative factor. "Why me?" statements seemed more prominent in this group than in the subject group.

Three month follow-up

Telephone contact was made with all subjects 3 months after the MI. The majority of patients reported feeling well with few, if any, cardiac symptoms. Indeed, some patients admitted to feeling better than before the MI. They had started exercising, quit smoking, and were trying to reduce the stressors in their lives. For many, the 3 month post-MI exercise/stress test had been a kind of symbolic mile-stone. Once they "passed" it and had been given a "go ahead" from their physician to, for example, return to work or join the Reh-Fit programme, they reported "...the worst (being) over".

In patients who were reporting significant limitation of function due to angina, there was a mixture of emotions from anger to sadness to frustration to fear of the future. Some patients who were unable to return to work seemed content with the decision and were able to make plans while others were quite distressed. Financial concerns seemed paramount in the latter subjects.

DISCUSSION

Recovery from myocardial infarction may be related to many factors, only one of which is the severity of the myocardial damage. For example, two people of the same age and with the same prognostic indices may, 3 months later, demonstrate very different outcomes in terms of functional abilities, reports of chest pain, and general adjustment. The bench-marks of recovery from MI are how much can the patient do physically without cardiac symptoms (cardiac functional capacity) and how well he has adapted to the changes in his life as a result of the MI (quality-of-life). This study has examined these bench-marks in an attempt to understand the differences in recovery so that clinicians can learn how to assist patients to achieve the best outcome possible.

Emotional Impact of the MI

A major purpose of this study was to examine the emotional impact of the MI on both patients and their wives at the time of the MI and 3 months later. The distress score assigned to patients in the hospital was not found to be correlated with any T1 variables such as age, severity of the MI, confidence regarding recovery, or wives' emotional reaction to the MI. It did, however, correlate with patients' anxiety and depression scores 3 months later, suggesting that it may be possible to identify patients who may have difficulties with adjustment based on in-hospital assessment alone. It also suggests that, in light of the findings that distress was not related to the situational variables assessed in this study, the patients' reactions to the MI at the time of the MI and their longer term adaptation may be more related to patients' longer term coping styles. Additional study would be needed in

order to address this conjecture.

Wives' emotional variables (both anxiety and depression scores) measured while the patient was in hospital were also predictive of emotional variables 3 months later. This supports the findings of other studies (e.g., Langeluddecke et al., 1989; Michela, 1987) which found that wives' anxiety was persistent. Whether the wives' emotional states are related to coping styles rather than situational variables, however, again needs to be examined in more depth.

Wives' depression and anxiety scores were related to patients' depression and anxiety scores suggesting that both the husband and the wife may have been experiencing similar emotions. This is compatible with the notion of the couple as a family system, responding to events in similar ways. If the co-existence of problems with anxiety and depression in both husband and wife can be replicated clinically, this finding will have implications for assessing and intervening with the couple and not just with the indentified patient.

For patients at T2 and wives at both T1 and T2, the correlations between Zung anxiety and depression scores were found to be high. It may be argued that a self-report paper and pencil questionnaire may not be distinguishing between clinical anxiety and depression *per se* but may instead be measuring a more global state of distress. A clinical evaluation would be helpful in, either making a distinction between the two states or confirming the presence of both. The salient point, for this study, is that it can be concluded that distress levels are higher than the population means as determined by Zung (1965, 1975). A further area for future investigation would be the notion of mixed anxiety-depression, a syndrome in which the patient does not meet full

criteria for either anxiety or depression but has enough symptoms of each to be significantly distressed.

Overprotectiveness

Another purpose of this study was to examine more closely the phenomenon of overprotectiveness. This study provided some empirical support for the speculation the overprotectiveness is a negative experience for the patient. It was found that patients who perceived themselves to be overprotected by their wives had higher scores on measures of anxiety and depression and a poorer quality-of-life at 3 months post-MI. Furthermore, the patients who perceived more overprotectiveness also perceived more criticism and less of a sense of caring from their wives.

Anecdotal reports of wives feeling the need to protect their husbands' from further cardiac damage highlight the wife's attempt to regain some control in a climate of anxiety and of helplessness (e.g., Levine, 1987). It was therefore hypothesized that the patients' sense of being overprotected would be correlated with the wives' anxiety scores. This hypothesis was not supported by the data from this study. Although the patients' anxiety scores correlated with a perception of being overprotected, neither wives' anxiety at the time of the MI nor at 3 months post-MI was found to correlate with the patients' perceptions of being overprotected.

However, wives' predictions of function at the time of the MI was correlated with the perception of being overprotected 3 months later. A possible explanation for this is that the wives who engaged in overprotective behaviour had less confidence in their husband's recovery or were less optimistic about their husband's recovery but did not necessarily act out of a

sense of their own anxiety. This was reinforced by the finding that, in examining partial correlations, wives' anxiety was not operative in the correlation between wives' estimates of function at the time of the MI and overprotectiveness.

Another explanation may be related to the correlations between a perception of overprotectiveness and high patient scores on measures of anxiety and depression. Clinically, it is known that patients who are emotionally distressed may be more sensitive to and more easily irritated by stimuli in the environment. The instrument used in this study was measuring, not the wife's overprotective behaviour, but the patient's perception (or possibly misperception) of the wife's behaviour. Therefore, it may not be the wife's behaviour *per se* but rather the patient's interpretation of it that is operative here. Furthermore, overprotectiveness was found to be related to the patient's perception of criticism from the wife and inversely related to satisfaction with family relationships, further strengthening the notion that the patient is unhappy about aspects of the relationship which may also colour his perceptions. In support of this, Baker, Kazarian, and Marquez-Julio (in press) found that hypertensive subjects with psychiatric complaints perceived their social environment differently and perceived more overprotectiveness than did hypertensive subjects without psychiatric complaints.

Finally, the wife may be responding in some way to the patient's distress. In order to plan interventions in this area, it would be helpful to clarify whether the operative factor is the wife's behaviour or the patient's perception of the wife's behaviour or a combination of both. For example, should treatment be aimed at modifying the wife's behaviour or the patient's perception of his environment? Future research on overprotectiveness should

focus on an actual measurement or description of the wives' behaviours, an explanation of why the wives are engaging in them, and how the husbands are perceiving those behaviours.

Cardiac functional capacity

The distribution of this variable was skewed due to the fact that most of the subjects in this study were experiencing little or no functional limitation as a result of the MI. Therefore, results should be interpreted cautiously. Further research with a larger pool of subjects with more severe functional limitation is necessary.

The hypothesis that patients' and wives' predictions of function made at the time of the MI would predict cardiac functional abilities 3 months later was not supported. At the time of the MI, patients and wives do not have any realistic information on which to base their estimations other than optimism and hope. However, correlations between patients' predictions at T1 and estimations at T2 and wives' predictions at T1 and estimations at T2 were significant suggesting that predictions at T1 do have some basis. In support of this, in a study of patients who had undergone cardiac surgery, Ruiz, Dibble, Gilliss and Gortner (1992) found that self-efficacy beliefs at the time of hospitalization predicted recovery 8 weeks later. Whether this relationship takes the form of a self-fulfilling prophecy related to optimism and confidence or a realistic assessment of capacity for recovery requires futher research.

Patients' self-efficacy and wives' estimation of their husbands' functioning at T2 were found to be related to cardiac functional capacity suggesting that the patients and wives had a realistic sense of the patients'

abilities. A study by Clarke (1989) found that self-efficacy estimates made by patients correlated significantly with actual exercise tolerance on a treadmill test further suggesting that self-efficacy is a valid estimation of a patient's abilities.

Quality-of-Life

Predictions of 3 month post-MI functioning made by both the patients and the wives at the time of the MI were found to predict quality of life 3 months after the MI. The relationships continued and strengthened by 3 months. One of the reasons for this may be that there are a number of similarities in item categories between the PAIS and the self-efficacy questionnaire. For example, both scales measure performance in social situations and sexual functioning. Indeed, the self-efficacy scale measures confidence in all the areas that Spitzer (1986) states should be assessed in a good quality of life measure -- physical functioning, mental status or emotional state, and the ability to engage in normative social interactions.

Patients' quality of life was also found to be related to the wives' anxiety scores at T2. This provides further support for the notion that patients' and wives' emotional states co-exist. There was also a significant correlation between overprotectiveness and quality of life suggesting that wives' coping may be related to the patients' overall adjustment.

Quality of life was also found to be related to the emotional variables of patients' distress at T1 and the patients' anxiety and depression scores at T2. It has been argued that a quality-of-life measure should include a measure of psychological adaptation. However, although the Psychological Adaptation to Illness Scale does include items related to psychological distress, these comprise only one of the 6 sub-scales considered in this

study. Because the PAIS is a relative frequency measure of quality of life, total scores on the scale give an indication of how the illness interferes with activities of daily living and usual functioning but does not give an indication of whether or not that is satisfactory for the patient.

Identification of patients and spouses at risk

The pure science of Behavioural Medicine examines how emotional and psychosocial adaptation to an illness can influence the course of that illness. The applied science of Behavioural Medicine operationalizes that information and determines if and how health care providers can assist patients and their families in this adaptation.

The majority of patients and their families seem to recover emotionally from an MI without the need for psychosocial intervention. However, it is the patients and their families who are in severe distress that remain most salient in clinicians' memories.

One subject from this study has been chosen for a brief case example. Mr. P. was a 44 year old auto mechanic who became disabled as a result of intractable angina. Although he had a 2 year history of recurrent angina and numerous visits to hospital, myocardial infarction had never been diagnosed. At the time of the MI, he had been in the process of starting his own business and had been under a significant amount of stress. Upon interview in the hospital, Mr. P. appeared very angry. He admitted to this anger and stated that he felt like a "prisoner". Helplessness and hopelessness were recurrent themes of the conversation as he stated "My future doesn't depend on me...I have no options...I'm not sure there is a future." He was resistant to instructions regarding lifestyle changes stating "..I don't like the

restrictions...I don't intend to follow them." "They say I should quit smoking but I probably won't even cut back. I may even smoke more." The distress rating assigned to this patient was 9 out of 10. The nurse who interviewed this patient reported feeling very uncomfortable with the anger being expressed.

The MI was uncomplicated with no signs of shock, heart failure, or rhythm disturbances and the patient was assigned a relatively low Peel index of 5 mostly based on his previous history of angina. His family history of heart disease was positive on both maternal and paternal sides. The patient smoked approximately one package of cigarettes every 2 weeks.

The patient's wife was present during the interview. She appeared supportive of her husband and agreed that he was experiencing a lot of hopelessness and anger. Questionnaire scores for this couple can be found in Table 13. Although Mrs. P.'s depression score was high, the other scores were all within one standard deviation of the mean for this study.

At the 3 month follow-up, it was found that Mr. P. had recently undergone an angioplasty for recurrent angina. His activity was limited due to the pain which classified him at Specific Activity Scale level 3. Although he admitted to feeling somewhat better after the angioplasty, both he and his wife expressed hopelessness regarding any return to premorbid functioning. Mrs. P. stated that Mr. P. really didn't remember much of what happened in the hospital at the time of the MI and didn't remember the study at all.

Most interesting at T2, however, was the deterioration in scores on the self-report questionnaires (Table 13). Mr. P.'s self-efficacy and Mrs. P.'s estimation of her husband's function had dropped dramatically. The wife's APGAR score fell from 10 to 0, while her scores on the Zung anxiety and

depression scales remained high but stable. The patient's PAIS score was 67, indicating severe problems with adaptation to the illness.

The diagnostic psychiatric interview with this patient showed significant symptoms in the areas of current PTSD, generalized anxiety disorder, and major depressive order. Mr. P. denied suicidal ideation but admitted to being depressed all the time. The patient attributed much of his symptomatology to the MI. Premorbid history of any psychiatric illness was unclear although he stated he had been depressed since the angina began two years previously.

Mrs. P. had some symptoms of PTSD and generalized anxiety disorder although she did not meet the full criteria for a either disorder. She admitted to fleeting thoughts of suicide. Mr. and Mrs.P. denied experiencing any other concommitant stressors. Finances were a concern for both. Neither Mr. nor Mrs. P. were receiving any mental health treatment nor had they discussed any of the PTSD symptoms with their health care providers.

This couple was the most severely distressed of those contacted in the study and the patient was experiencing significant incapacitation for both psychological and physical reasons. Indeed, it is difficult to determine whether the angina or the depression was the most disabling. Furthermore, there were a number of indicators while the patient was still in hospital at the time of the MI that there might be problems with adaptation to the illness.

Although Blumenthal (1985) recommended that all MI patients be psychologically screened while in hospital, this is neither practical nor necessary as a majority of patients will adapt to the MI without need for psychological intervention. However, as demonstrated here, an initial nursing

Table 15

Questionnaire scores at T1 and T2 for the Case study subjects

MEASURE	TIME	
Patient:	In hospital	At 3 months
Overprotectiveness	x	16
Family function (APGAR)	6	5
Prediction of function	42	19
Anxiety (Zung scale)	x	.55
Depression (Zung scale)	x	.69
Quality of Life	x	67
Wife:		
Family function (APGAR)	10	0
Anxiety (Zung scale)	.54	.50
Depression (Zung scale)	.63	.68
Prediction of husband's functional capacity	50	35

assessment could provide a indication of which patients may require further psychological assessment.

Although treatment must always be based on an individual patient's needs, this study suggests that there are a number of areas where targeted MI patients may benefit from some intervention. Furthermore, it is necessary to determine on what bases patients will be targeted. Quality-of-life at three months was predicted by patients' distress scores in hospital. It is possible that screening for anxiety and depression while the patient is in hospital could identify those patients who should be further assessed.

Based on this study and on Clarke (1989), another indicators of possible problems with physical and psychological adaptation could be patients' and wives' prediction of function. Whether low predictions are a self-fulfilling prophecy or an accurate assessment of the patient's abilities, they are none-the-less related to anxiety, depression, and the perception of being overprotected in the patient and can be used as a "red flag" for further assessment and possible treatment.

Limitations

A limitation of this study was the relatively small sample size and, consequently, the small number of patients and wives who were having adjustment and/or cardiac difficulties. Statistical analyses concerning the cardiac functional classifications lacked power because of the limited range of scores.

Although subjects were recruited from four different city hospitals (both teaching and community hospitals), all subjects were white and a majority of subjects were middle-class or working-class. Only three subjects

were from rural areas. Thus, generalizability of results must be limited to similar populations.

Some subjects and their wives voluntarily undertook various sorts of rehabilitation and self-help interventions that could not ethically be controlled. There were a variety of interventions that included such activities as self-help reading, attendance at a local cardiac rehabilitation program, attendance at couple-focussed (Heartmates[R]) psychoeducational sessions at the Grace Hospital, and private counselling that may or may not have been related to the cardiac event. Although all of these activities were documented by the investigator, it was difficult to control for these activities statistically because of the diversity and the differential benefits.

Finally, some subjects and their wives had multiple psychosocial traumas around the time of the MI which may have contributed to their feelings of depression and anxiety. For example, one wife lost both her parents within months after her husband's MI. Another wife suffered an MI herself within six weeks of her husband. Loss of employment for a number of subjects, whether related to the MI or not, was another significant stressor that contributed to feelings of worthlessness and depression. Other subjects and their wives stated that the MI reawakened dormant post-traumatic stress from previous life events. These factors, a normal part of people's lives, make control of emotional variables like anxiety, depression, and quality-of-life difficult and reinforce the need for individualized assessment and treatment planning. Future research could include a comparison group of matched age couples to control for typical psychosocial stressors and developmental tasks.

As a follow-up to this study, structured psychiatric interviews at 3 and

12 months post-MI are being conducted. The data from these interviews will provide more detailed information about the problems experienced by the couples. Additionally, questions about the availability and helpfulness of resources will assist in planning appropriate interventions.

REFERENCES

Aaronson, N.K. (1989). Quality of Life assessment in clinical trials: Methological issues. Controlled Clinical Trials, 10, 195S-208S.

Adsett, C.A., & Bruhn, J.G. (1968). Short-term psychotherapy for post-MI patients and their wives. Canadian Medical Association Journal, 99 (12), 577-584.

American Heart Association. (1972). Exercise testing and training of apparently healthy individuals: A handbook for physicians. New York: Author.

American Heart Association Review Panel on Coronary-prone Behavior (1981). Coronary-prone behavior and coronary heart disease: A critical review. Circulation, 63 (6), 1199-1215.

American Psychiatric Association (1987). Diagnostic and Statistical Manual of Mental Disorders - Third Edition - Revised. Washington, D.C.: Author.

Appels, A., & Mulder, P. (1984). Imminent myocardial infarction: A psychological study. Journal of Human Stress, 10, 129-134.

Arensberg, D. (1981). The role of beta adrenergic blocking agents in the management of patients with acute myocardial infarction. Primary Care, 8 (3), 461-466.

Badger, T.A. (1990). Men with cardiovascular disease and their spouses: Coping, health, and marital adjustment. Archives of Psychiatric Nursing, 4 (5), 319-324.

Baker, B., Helmes, E., & Kazarian, S.S. (1984). Past and present perceived attitudes of schizophrenics in relation to rehospitalization. British Journal of Psychiatry, 144, 263-269.

Baker, B., Kazarian, S.S., Helmes, E., Ruckman, M., & Tower, N. (1987). Perceived attitudes of schizophrenic inpatients in relation to rehospitalization. Journal of Consulting and Clinical Psychology, 55 (5), 775-777.

Baker, B., Kazarian, S., & Marquez-Julio, A. Perceived interpersonal attitudes and psychiatric complaints in patients with essential hypertension. In press.

Bandura, A. (1982). Self-efficacy mechanism in human agency. American Psychologist, 37 (2), 122-147.

Beck, A.T., Ward, C.H., & Mendelson, M. (1961). An inventory for measuring depression. Archives of General Psychiatry, 4, 561-571.

Beck, J.G., Berisford, M.A., Taegtmeyer, H., & Bennett, A. (1990). Panic symptoms in chest pain without coronary artery disease: A comparison with panic disorder. Behaviour Therapy, 21, 241-252.

Ben-Zira, Z., & Eleizer, R. (1990). The structure of readjustment after heart attack. Social Science and Medicine, 30 (5), 523-536.

Bergner, M., Bobbit, R.A., Carter, W.B., & Gilson, B.S. (1981). The Sickness Impact Profile: Development and final revision of a health status measure. Medical Care, 19 (8), 787-805.

Bigger, J.T., Fleiss, J.T., Kleiger, R., Miller, J.P., & Rolnitzky, L.M. (1984). The relationship among ventricular arrhythmias, left ventricular dysfunction and mortality in the two years after myocardial infarction. Circulation, 69 (2), 250-258.

Blanchard, E.B., & Miller, S.T. (1977). Psychological treatment of cardiovascular disease. Archives of General Psychiatry, 34, 1402-1413.

Blumenthal, J.A., & Levenson, R.M. (1987). Behavioral approaches to secondary

prevention of coronary heart disease. <u>Circulation</u>, <u>76</u> (suppl. I),
I130-I137.

Braden, C.J. (1990). Learned self-help response to chronic illness
experience: A test of three alternative learning theories. <u>Scholarly
Inquiry for Nursing Practice</u>, <u>4</u> (1), 23-41.

Bramwell, L. (1990). Social support in cardiac rehabilitation. <u>Canadian
Journal of Cardiovascular Nursing</u>, <u>1</u> (4), 7-13.

Bramwell, L., & Whall, A.I. (1986). Effect of role clarity and empathy on
support role performance and anxiety. <u>Nursing Research</u>, <u>35</u> (5),
282-287.

Brand, R.J., Rosenman, R.H., Scholtz, R.I., & Friedman, M, (1976).
Multivariate prediction of coronary heart disease in the Western
Collaborative Group Study compared to the findings of the Framingham
Study. <u>Circulation</u>, <u>53</u> (2), 348-355.

Brezinski, D., Stone, P.H., Muller, J.E., Tofler, G.H., Davis, V., Parker, C.,
Hartley, L.H., Braunwald, E., & the MILIS Study Group. (1991).
Prognostic significance of the Karnofsky Performance Status score in
patients with acute myocardial infarction: Comparison with the left
ventricular ejection fraction and the exercise treadmill test
performance. <u>American Heart Journal</u>, <u>121</u>, 1374-1361.

Bush, J.W. (1984). Relative preferences versus relative frequencies in
health-related quality of life evaluations. In N.K. Wenger, M.E.
Mattson, C.D. Furberg, & J. Elinson (Eds.), <u>Assessment of quality of
life in clinical trials of cardiovascular therapies</u> (pp. 118-139).
LeJacq Publishing Company.

Campeau, L. (1975). Grading of angina pectoris. <u>Circulation</u>, <u>54</u>, 522.

Canadian Council of Cardiovascular Nurses (1983). Standards of

cardiovascular nursing practice. Ottawa: Canadian Nurses Association.

Canadian Pharmaceutical Association (1990). Compendium of Pharmaceuticals and

Specialties. Ottawa: Author.

Carney, R.M., Rich, M.S., Friedland, K.E., Saini, J., TeVelde, A., Simeone,

C., & Clark, K. (1988). Major depressive disorder predicts cardiac

events in patients with coronary heart disease. Psychosomatic Medicine,

104, 627-633.

Cassem, N.H., & Hackett, T.P. (1973). Psychological rehabilitation of

myocardial infarction patients in the acute phase. Heart and Lung, 2,

382-388.

Christman, N.J., McConnell, E.A., Pfeiffer, C., Webster, K.K., Schmitt, M, &

Ries, J. (1988). Uncertainty, coping and distress following myocardial

infarction and transition from hospital to home. Research in Nursing

and Health, 2 (2), 71-82.

Clarke, D.E. (1989). The influence of self-efficacy and social support on

recovery post-myocardial infarction. Unpublished masters thesis.

Winnipeg: University of Manitoba.

Cochrane, B.L. (1992). Acute myocardial infarction in women. Critical Care

Nursing Clinics of North America, 4 (2), 279-289.

Cooper, C.L., Faragher, E.G., Bray, G.L., & Ramsdale, D.R. (1985). The

significance of psychosocial factors in predicting coronary disease in

patients with valvular heart disease. Social Science and Medicine, 20

(4), 315-318.

Costa, P.T., Zonderman, A.B., Engel, B.T., Baile, W.F., Brimlow, D.L., &

Brinker, J. (1985). The relation of chest pain symptoms to angiographic

evidence of coronary arterial stenosis and neuroticism. Psychosomatic Medicine, 47 (3), 285-293.

Croog, S.H. (1983). Recovery and rehabilitation of heart patients: Psychosocial aspects. In D.S. Krantz, A. Baum & J.E. Singer (Eds.), Handbook of psychology and health (Vol. 3) (pp. 295-334). Hillsdale, N.J.: Lawrence Erlbaum Associates.

Croog, S.H., & Levine, S. (1977). The heart patient recovers: Social and psychological factors. New York: Human Sciences Press.

Daltroy, L.H., & Godin, G. (1989a). Spouse intention to encourage cardiac patient participation in exercise. American Journal of Health Promotion, 4 (1), 12-17.

Daltroy, L.H., & Godin, G. (1989b). The influence of spousal approval and patient perception of spousal approval on cardiac patient participation in exercise programs. Journal of Cardiopulmonary Rehabilitation, 9, 363-367.

Degre-Coustry, D., & Grevise, M. (1982). Psychological problems in rehabilitation after myocardial infarction: Non-institutional approach. Advances in Cardiology, 29, 126-131.

Derogatis, L.R. (1977). Manual for the Symptom Checklist-90 Revised. Baltimore: Johns Hopkins University School of Medicine.

Derogatis, L.R. (1986). The Psychosocial Adjustment to Illness Scale (PAIS). Journal of Psychosomatic Research,30 (1), 77-91.

Derogatis, L.R., & Derogatis, M.F. (1990). PAIS and PAIS-SR: Administration, scoring and procedures manual: II. Towson, Maryland: Clinical Psychometric Research, Inc.

Doehrman, S.R. (1977). Psychosocial aspects of recovery from coronary heart

disease: A review. <u>Social Science and Medicine</u>, <u>11</u>, 199-218.

Donaldson, G., McCorkle, R., Georgiadou, F., & Benoleil, J.Q. (1986). Distress, dependency, and threat in newly diagnosed cancer and heart disease patients. <u>Multivariate Behavioral Research</u>, <u>21</u>, 267-298.

Dracup, K., Meleis, A., Baker, K., & Edlefson, P. (1984). Family-focused cardiac rehabilitation: A role supplementation program for cardiac patients and spouses. <u>Nursing Clinics of North America</u>, <u>19</u> (1), 113-123.

Dracup, K., Meleis, A., Clark, S., Clyburn, A., Shields, L., & Staley, M. (1984). Group counselling in cardiac rehabilitation: Effect on patient compliance. <u>Patient Education and Counselling</u>, <u>6</u> (4), 169-177.

Engel, B.T., Baile, W.F., Costa, P.T., Brimlow, L.D., & Brinker, J. (1985). A behavioral analysis of chest pain in patients suspected of having coronary artery disease. <u>Psychosomatic Medicine</u>, <u>47</u> (3), 274-279.

Evans, D.R., & Cope, W.E. (1989). <u>Manual for the Quality of Life Questionnaire</u>. Toronto: Multi-Health Systems, Inc.

Ewart, C.K., Taylor, C.B., Reese, L.B., & DeBusk, R.F. (1983). Effects of early post-myocardial infarction exercise training on self-perception and subsequent physical activity. <u>American Journal of Cardiology</u>, <u>51</u>, 1076-1080.

Findlayson, A. (1976). Social networks as coping resources. <u>Social Science and Medicine</u>, <u>10</u>, 97-103.

Fletcher, A.E., Hunt, B.M., & Bulpitt, C.J. (1987). Evaluation of quality of life in clinical trials of cardiovascular disease. <u>Journal of Chronic Diseases</u>, <u>40</u> (6), 557-566.

Fontana, A.F., Kerns, R.D., Rosenberg, R.L., & Colonese, K.D. (1989). Support, stress, and recovery from coronary heart disease: A

longitudinal causal model. Health Psychology, 8 (2), 175-193.

Frasure-Smith, N. (1991). In-hospital symptoms of psychological stress as predictors of long-term outcome after acute myocardial infarction in men. American Journal of Cardiology, 67, 121-127.

Frasure-Smith, N., & Prince, R. (1985). The ischemic heart disease stress monitoring program: Impact on mortality. Psychosomatic Medicine, 47 (5), 431-445.

Freeland, K.E., Carney, R.M., Lustman, P.J., Rich, R.M., & Jaffe, A.S. (1992). Major depression in coronary artery disease patients with vs. without a prior history of depression. Psychosomatic Medicine, 54, 416-421.

Freeman, L.J., Nixon, P.G.F., Sallabank, P., & Reavely, D. (1987). Psychological stress and silent myocardial ischemia. American Heart Journal, 114, 447-482.

Friedman, H., & Booth-Kewley, S. (1987). Disease-prone personality: A meta-analysis view of the construct. Psychosomatics, 114 (42), 539-555.

Gabrys, J.B., & Peters, K. (1985). Reliability, discriminant and predictive validity of the Zung Self-rating Depression Scale. Psychological Reports, 57, 1091-1096.

Garrity, T.F. (1975). Morbidity, mortality, and rehabilitation. In W.D. Gentry and R.B. Williams (Eds.), Psychological aspects of myocardial infarction and cardiac care. St. Louis: Mosby.

Gilliss, C.L. (1984). Reducing family stress during and after coronary artery bypass surgery. Nursing Clinics of North America, 19 (1), 103-111.

Goldman, L., Hashimoto, B., Cook, E.F., & Loscalzo, A. (1981). Comparative reproducibility and validity of systems for assessing cardiovascular functional class: Advantages of a new Specific Activity Scale.

Circulation, 64 (6), 1227-1234.

Good, M.D., Smilkstein, G., Good, B.J., Schaffer, T., & Arons, T. (1979). The Family APGAR Index: A study of construct validity. Journal of Family Practice, 8 (3), 577-582.

Gottleib, S.O., Weisfeldt, M.L., Ouyang, P., Mellits, E.D., & Gostenblith, G. (1986). Silent ischemia as a marker for early unfavorable outcomes in patients with unstable angina. New England Journal of Medicine, 314 (10), 1214-1219.

Griffin, P.R., & Kogut, D. (1988). Validity of orally administered Beck and Zung depression scales in a state hospital. Journal of Clinical Psychology, 44 (5), 756-759.

Hackett, T.P., & Cassem, N.J. (1973). Psychological adaptation to convalescence in myocardial infarction patients. In J.P. Naughton & H.K. Hellerstein (Eds.), Exercise testing and exercise training in coronary heart disease (pp. 253-262). New York: Academic Press.

Hammerstein, K.E., Timothy, T.A., & Dodge, H.T. (1979). Variables predictive of survival in patients with coronary disease. Circulation, 59 (3), 421-430.

Havik, O.E., & Maeland, J.G. (1990). Patterns of emotional reactions after a myocardial infarction. Journal of Psychosomatic Research, 34 (3), 271-285.

Helmer, D.C., Ragland, D.R., & Syme, S.L. (1991). Hostility and coronary artery disease. American Journal of Epidemiology, 133 (2), 112-122.

Hickie, C., & Snowdon, J. (1987). Depression scales for the elderly. Clinical Gerontologist, 6 (3), 51-53.

Huber, D., Henrich, G., & Herschbach, P. (1988). Measuring the Quality of

Life: A comparison between physicially and mentally chronically ill patients and healthy persons. Pharmacopsychiatry, 21, 543-455.

Ibrahim, M.A., Feldman, J.G., Sultz, H.A., Staiman, M.G., Young, L.J., Dean, D. (1974). Management after myocardial infarction: A controlled trial of the effects of group psychotherapy. International Journal of Psychiatry in Medicine, 5 (3), 253-268.

Jacobsen, N.S., Follette, W.C., & Revenstorf, D. (1984). Psychotherapy outcome research: Methods for reporting variability and evaluating clinical significance. Behavior Therapy, 15, 336-352.

Jacobsen, N.S., Wilson, L., & Tupper, C. (1988). The clinical significance of treatment gains resulting from exposure-based interventions for agoraphobia: A reanalysis of outcome data. Behavior Therapy, 19, 539-554.

Jenkins, C.D., Stanton, B.A., Savageau, J.A., Denlinger, P., & Klein, M.D. (1983). Coronary artery bypass surgery: Physical, psychological, social and economic outcomes six months later. Journal of the American Medical Association, 250 (6), 782-788.

Johnson, J.L., & Morse, J.M. (1990). Regaining control: The process of adjustment after myocardial infarction. Heart and Lung, 19 (2), 126-135.

Johnston, D.W. (1985). Psychological interventions in cardiovascular disease. Journal of Psychosomatic Research, 29 (5), 447-456.

Julian, D.G. (1987). Quality of life after myocardial infarction. American Heart Journal, 114 (1), 241-244.

Kaplan, R.M. (1988). Health-related quality of life in cardiovascular disease. Journal of Consulting and Clinical Psychology, 56 (3),

382-392.

Karliner, J.S., & Gregoratis, G. (1983). The cardiovascular system. In C.A.

Guenter (Ed.), Internal Medicine (pp. 609-698). New York: Churchill

Livingston.

Karnofsky, D.A., Abelmann, W.H., Craver, L.F., & Burchenal, J.H. (1948). The

use of nitrogen mustards in the palliative treatment of carcinoma.

Cancer, 1, 634-656.

Kaufmann, M.W., Pasacreta, J., Cheney, R., & Arcuni, O. (1985-86).

Psychosomatic aspects of myocardial infarction and implications for

treatment. International Journal of Psychiatry in Medicine, 15 (4),

371-379.

Kavanaugh, T., Shepherd, R.H., Chisholm, A.W., Querski, S., & Kennedy, J.

(1979). Prognostic indexes for patients with ischemic heart disease

enrolled in an exercise-centred rehabilitation program. American

Journal of Cardiology, 44, 1230-1236.

Kazarian, S.S., & Baker, B. (1987). Influential relationships questionnaire:

Data from a nonclinical population. Psychological Reports, 61, 511-514.

Kazarian, S.S., Baker, B., & Helmes, E. (1987). The Parental Bonding

Instrument: Factorial structure. British Journal of Clinical

Psychology, 26, 231-232.

Kazarian, S.S., Malla, A.K., Cole, J.D., & Baker, B. (1990). Comparisons of

two expressed emotion scales with the Camberwell Family Interview.

Journal of Clinical Psychology, 46 (3), 306-309.

Kazis, L.E. (1991). Health outcome assessments in medicine: History,

applications, and new directions. Advances in Internal Medicine, 36,

109-130.

Kozeny, J. (1987). Psychometric properties of the Zung Self-rating Depression
Scale. Activitas Nervosa Superior, 29 (4), 279-284.

Krantz, D.S., Gabbay, F.H., Hedges, S.M., Leach, S.G., Gottdiener, J.S., &
Rozanski, A. (1993). Mental and physical triggers of silent myocardial
ischemia: Ambulatory studies using self-monitoring diary methodology.
Annals of Behavioral Medicine, 15 (1), 33-40.

Kutz, I., Garb, R., & David, D. (1988). Post-traumatic stress disorder
following myocardial infarction. General Hospital Psychiatry, 10, 169-
176.

Langeluddecke, P., Tennant, C., Fulcher, G., Barid, D., & Hughes, C. (1989).
Coronary artery bypass surgery: Impact upon the patient's spouse.
Journal of Psychosomatic Research, 33 (2), 155-159.

Leahey, M., & Wright, L.M. (1987). Families and chronic illness: Assumptions,
assessment, and intervention. In L.M. Wright & M. Leahey (Eds.),
Families and chronic illness (pp. 55-76). Springhouse, Pennsylvania:
Springhouse Corporation.

Legault, S.E., Joffe, R.T., & Armstrong, P.W. (1992). Psychiatric morbidity
during the early phase of coronary care for myocardial infarction:
Association with cardiac diagnosis and outcome. Canadian Journal of
Psychiatry, 37, 316-325.

Levenson, J.L., Mishra, A., Hamer, R.M., & Hastillo, A. (1989). Denial and
medical outcome in unstable angina. Psychosomatic Medicine, 51 (1),
27-35.

Levine, J., Warrenberg, S., Kerns, R., & Schwartz, G.E. (1987). The role of
denial in recovery from coronary heart disease. Psychosomatic Medicine,
49 (2),109-117.

Levine, R.F. (1987). <u>Heartmates: A survival guide for the cardiac spouse</u>. New York: Pocket Books.

Levine, S., & Croog, S.H. (1984). What constitutes quality of life? A conceptualization of the dimension of life quality in healthy populations and patients with cardiovascular disease. In N.K. Wenger, M.E. Mattson, C.D. Furberg, & J. Elinson (Eds.), <u>Assessment of quality of life in clinical trials of cardiovascular therapies</u> (pp. 46-66). LeJacq Publishing Company.

Lloyd, G.G., & Cawley, R.H. (1978). Psychiatric morbidity in men one week after the first myocardial infarction. <u>British Medical Journal, ii,</u> 1453-1454.

Lloyd, G.G., & Cawley, R.H. (1982). Psychiatric morbidity after myocardial infarction. <u>Quarterly Journal of Medicine, 201</u>, 33-42.

Maelund, J.G., & Havik, O.E. (1987). Psychological predictors for return to work after a myocardial infarction. <u>Journal of Psychosomatic Research, 31</u> (4), 471-481.

Manuck, S.B., & Krantz, D.S. (1984). Psychophysiologic reactivity in coronary heart disease. <u>Behavioral Medicine Update, 6</u> (3), 11-15.

Mayou, R.A. (1983). A controlled trial of early rehabilitation after myocardial infarction. <u>Journal of Cardiac Rehabilitation, 3</u>, 397-402.

Mayou, R. (1984). Prediction of emotional and social outcome after a heart attack. <u>Journal of Psychosomatic Research, 28</u> (1), 17-25.

Mayou, R., Sleight, P., MacMachon, D., & Florencio, M.J. (1981). Early rehabilitation after myocardial infarction. <u>Lancet, 2</u>, 1399-1401.

McCubbin, H.I., & McCubbin, M.A. (1987a). Family system assessment in health care. In H.I. McCubbin & A.I. McCubbin (Eds.), <u>Family assessment</u>

inventories for research and practice (pp. 51-25). Madison, Wisconsin: University of Wisconsin Press.

McCullough, L.B. (1984). Concept of the quality of life: A philosophical analysis. In N.K. Wenger, M.E. Mattson, C.D. Furberg, & J. Elinson (Eds.), Assessment of quality of life in clinical trials of cardiovascular therapies (pp. 25-36). LeJacq Publishing Company.

Meyers, J.K., & Weissman, M.M. (1980). Use of a self-report symptom scale to detect depression in a community sample. American Journal of Psychiatry, 138, 1081-1084.

Michela, J.L. (1987). Interpersonal and individual impacts of a husband's heart attack. In A. Baum & J.E. Singer (Eds.), Handbook of Psychology and Health (Vol. 5) (pp. 255-301). Hillsdale, N.J.: L. Erlbaum & Associates.

Miklowitz, D.J., Goldstein, M.J., Neuchterlein, K.H., Snyder, K.S., & Mintz, J. (1988). Family factors and the course of bipolar affective disorder. Archives of General Psychiatry, 45 (3), 225-231.

Miller, P., Wickoff, R., Garrett, M.J., McMahon, M., & Smith, T. (1990). Regimen compliance two years after myocardial infarction. Nursing Research, 39 (6), 333-336.

Minuchin, S., Rosman, B.L., & Baker, L. (1978). Psychosomatic families: Anorexia nervosa in context. Cambridge, Massachusetts: Harvard University Press.

Mishel, M.H., & Braden, C.J. (1987). Uncertainty: A mediator between support and adjustment. Western Journal of Nursing Research, 9 (1), 43-57.

Mor, V., Laliberte, L., Morris, J.N., & Wiemann, M. (1984). The Karnofsky Performance Status Scale: An examination of its reliability and

validity in a research setting. <u>Cancer</u>, <u>53</u>, 2002-2007.

Naughton, J. (1973). The effects of acute and chronic exercise on cardiac patients. In J.P. Naughton & H.K. Heller (Eds.). <u>Exercise testing and training in coronary heart disease</u> (pp. 337-346). New York: Academic Press.

Naughton, J., & Haider, R. (1973). Methods of exercise testing. In J.P. Naughton & H.K. Heller (Eds.). <u>Exercise testing and training in coronary heart disease</u> (pp. 79-91). New York: Academic Press.

New York Heart Association. (1979). <u>Nomenclature and criteria for diagnosis of diseases of the heart and blood vessels</u>. New York: Peter F. Mellon Inc.

Nir, Z., & Neumann, L. (1990). Motivation patterns, self-esteem, and depression of patients after first myocardial infarction. <u>Behavioral Medicine</u>, <u>1</u>, 62-66.

Nyamathi, A.M. (1987). The coping responses of female spouses of patients with MI. <u>Heart and Lung</u>, <u>16</u> (1), 86-91.

Nyamathi, A.M. (1990). Assessing the coping status of critically ill cardiac patients: A theoretically based approach. <u>Journal of Cardiovascular Nursing</u>, <u>5</u> (1), 1-12.

Nyamathi, A., Jacoby, A., Constancia, P., & Ruvevich, S. (1992). Coping and adjustment of spouses of critically ill patients with cardiac disease. <u>Heart and Lung</u>, <u>21</u> (2), 160-166.

Oldenberg, B., Perkins, R.J., & Andrews, G. (1985). Controlled trial of psychological intervention in myocardial infarction. <u>Journal of Consulting and Clinical Psychology</u>, <u>53</u> (6), 852-859.

Parker, G., Tupling, H., & Brown, L.B. (1979). A parental bonding instrument.

British Journal of Medical Psychology, 52, 1-10.

Peel, A.A., Semple, T., Wang, J., Lancaster, W.M., & Dall, J.L.G. (1962). A coronary prognostic index for grading the severity of infarction. British Heart Journal, 24, 745-760.

Pepine, C.J. (1989). New concepts in the pathophysiology of acute myocardial infarction. American Journal of Cardiology, 64, 2B-8B.

Pfeffer, M.A., & Braunwald, E. (1990). Ventricular remodeling after myocardial infarction: Experimental observations and clinical implications. Circulation, 81 (4), 1161-1172.

Powell, L.H., & Thoresen, C.E. (1985). Behavioral and physiologic determinants of long-term prognosis after myocardial infarction. Journal of Chronic Diseases, 38, 253-263.

Rankin, S.H., & Gilliss, C.L. (1987). Intervening with middle-aged families recovering from cardiac surgery. In L.M. Wright & M. Leahey (Eds.), Families and chronic illnesses (pp. 367-380). Springhouse, Pennsylvania: Springhouse Corporation.

Rechnitzer, P,A., Pickard, H.A., Paivio, A.U., Yuhas, M.S., & Cunningham, D. (1972). Longterm followup study of survival and recurrence rates following myocardial infarction in exercising and control subjects. Circulation, 45, 853-857.

Reiss, D., Gonzalez, S., & Kramer, N. (1986). Family process, chronic illness, and death: On the weakness of strong bonds. Archives of General Psychiatry, 43, 795-804.

Riegel, B.J., & Dracup, K.A. (1992). Does overprotection cause cardiac invalidism after acute myocardial infarction? Heart and Lung, 21 (6), 529-535.

Rolland, J.S. (1987). Chronic illness and the family: An overview. In L.M.

Wright & M. Leahey (Eds.), Families and chronic illness (pp. 33-54).

Springhouse, Pennsylvania: Springhouse Corporation.

Rosenman, R. (1983). Type A behavior in ischemic heart disease. In T.M.

Dembroski, F.H. Schmidt, & G. Blumchen (Eds.), Biobehavioral bases of

coronary heart diseases (pp. 5-17). Basel: Karger.

Rosengren, A., Tibblin, G., & Wilhelmsen, L. (1991). Self-perceived

psychological stress and incidence of coronary artery disease in middle-

aged men. American Journal of Cardiology, 68, 1171.

Rovario, S., Holmes, D.S., & Holmsten, R.D. (1984). Influence of a cardiac

rehabilitation program on the cardiovascular, physiological and social

functioning of cardiac patients. Journal of Behavioral Medicine, 7 (1),

61-81.

Ruberman, W., Weinblatt, E., Goldberg, J.D., & Chaudhary, B.S. (1984).

Psychosocial influences on mortality after myocardial infarction. New

England Journal of Medicine, 311 (9), 552-356.

Ruiz, B.A., Dibble, S.L., Gilliss, C.L., & Gortner, S.R. (1992). Predictors

of general activity eight weeks after cardiac surgery. Applied Nursing

Research, 5 (2), 59-65.

Schaefer, A. (1985). Comparison of the validities of the Beck, Zung, and MMPI

Depression scales. Journal of Consulting and Clinical Psychology, 53

(3), 415-418.

Seeman, T.E., & Syme, S.L. (1987). Social networks and coronary artery

disease: A comparison of the structure and functionof social relations

as predictors of disease. Psychosomatic Medicine, 49, 341-354.

Shanfield, S.B. (1990). Return to work after an acute myocardial infarction.

Heart and Lung, <u>19</u> (2), 109-117.

Silverstone, P.H. (1987). Depression and outcome in acute myocardial infarction. _British Medical Journal_, <u>294</u>, 219- 220.

Skelton, M., & Dominian, J. (1973). Psychological stress in wives of patients with myocardial infarction. _British Medical Journal_, <u>2</u>, 101-103.

Smilkstein, G. (1978). The family APGAR: A proposal for a family function test and its use by physicians. _Journal of Family Practice_, <u>6</u> (6), 1231-1239.

Smith, G.R., & O'Rourke, D.F. (1988). Return to work after a first MI. _Journal of the American Medical Association_, <u>259</u> (11), 1673-1677.

Spitzer, W.O. (1987). State of Science 1986: Quality of life and functional status as target variables for research. _Journal of Chronic Diseases_, <u>40</u> (6), 465-471.

Stern, M.J., Pascale, L, & Ackerman, A. (1977). Life adjustment postmyocardial infarction. _Archives of Internal Medicine_, <u>137</u>, 1680-1685.

Stewart, A.L. (1983). _Measuring the ability to cope with serious illness_. Santa Monica: The Rand Corporation.

Storstein, L. (1987). How should changes in lifestyle be measured in cardiovascular disease? _American Heart Journal_, <u>114</u> (1), 210-212.

Teo, K.K., & Kappagoda, C.T. (1984). An approach to the rehabilitation of patients after myocardial infarction. _Modern Medicine of Canada_, <u>39</u> (8), 11-26.

Tessar, G.E., & Hackett, T.P. (1985). Psychiatric management of the hospitalized cardiac patient. _Journal of Cardiopulmonary Rehabilitation_, <u>5</u>, 219-225.

Thompson, D., Cordle, C., & Sutton, T. (1982). Anxiety in coronary patients. International Rehabilitation Medicine, 4, 161-163.

Thompson, D.R., & Meddis, R. (1990a). A prospective evaluation of in-hospital counselling for first time myocardial infarction men. Journal of Psychosomatic Research, 34 (3), 237-248.

Thompson, D.R., & Meddis, R. (1990b). Wives' responses to counselling early after myocardial infarction. Journal of Psychosomatic Research, 34 (3), 249-258.

Waltz, M., Badura, B., & Schott, T. (1988). Marriage and the psychological consequences of a heart attack: A longitudinal study of adapatation to chronic illness after three years. Social Science and Medicine, 2, 149-158.

Ware, J.E. (1984). Methodological considerations in the selection of health status assessment procedures. In N.K. Wenger, M.E. Mattson, C.D. Furberg, & J. Elinson (Eds.). Assessment of quality of life in clinical trials of cardiovascular therapies (pp. 87-111). LeJacq Publishing Company.

Weissman, M.M., Sholomskas, D., Pottenger, M., Prusoff, B. A., & Locke, B.Z. (1977). Assessing depressive symptoms in five psychiatric populations: A validation study. American Journal of Epidemiology, 106, 203-214.

Wenger, N.K. (1990). Quality of life in chronic cardiovascular illness (editorial). Journal of Cardiopulmonary Rehabilitation, 88-91.

Wenger, N.K. (1981). Rehabilitation of the patient with myocardial infarction: Responsibility of the primary care physician. Primary Care, 8 (3), 491-507.

Wenger, N.K., Mattson, M.E., Furberg, C.D., & Elinson, J. (1984). Assessment

of quality of life in clinical trials of cardiovascular therapies. LeJacq Publishing Company.

White, J., Ferris, R.M., Brown, M.A., Brandt, P.W.T., Whitlock, R.M.L., & Wild, C.J. (1987). Left ventricular end-systolic volume as the major determinant of survival after recovery from myocardial infarction. Circulation, 76 (1), 44-51.

Wicklund, I., Sanne, H., Vedin, A., & Wilhelmsson, C. (1984a). Sick-role and attitude towards disease and working life two months after a myocardial infarction. Scandinavian Journal of Rehabilitative Medicine, 16, 57-64.

Williams, J., & Wallace, W.G. (1983). Coronary artery disease. In K.G. Andreoli, V.K. Fowkes, D.P Zipes & A.G. Wallace (Eds.). Comprehensive Cardiac Care (pp. 10-17). St Louis: C.V. Mosby.

Wishie, H.A., Hackett, T.P., & Cassem, N.H. (1971). Psychological hazards of convalescence following myocardial infarction. Journal of the American Medical Association, 214, 1292-1296.

Wood, B., Watkins, J.B., Boyle, J.T., Noguira, J., Zimand, E., & Carroll, L. (1989). The "psychosomatic family" model: An empirical and theoretical analysis. Family Process, 28, 399-417.

Wright, L.M., & Leahey, M. (1987). Families and life-threatening illness: Assumptions, assessment, and intervention. In M. Leahey & L.M. Wright (Eds.). Families and life-threatening illness (pp. 45-58). Springhouse, Pennsylvania: Springhouse Corporation.

Younger, M.S. (1985). A first course in linear regression (second edition). Boston: Duxbury Press.

Zung, W.W.K. (1965). A self-rating depression scale. Archives of General Psychiatry, 12, 60-63.

Zung, W.W.K. (1971). A rating instrument for anxiety disorders.

    Psychosomatics, 12 (6), 371-379.

Zung, W.W.K., & Zung, E.M. (1986). Use of the Zung Self-rating Depression

    Scale in the elderly. Clinical Gerontologist, 5 (1-2), 137-148.

APPENDIX A

CONSENT FORM - PATIENT

I have read and understand the above information about the study of post-MI recovery. I understand the study procedure, including interview and questionnaires while in the hospital and questionnaires at three and twelve months post-MI. I also understand the home interview procedure at three and twelve months post-MI.

I understand and agree that my spouse will be approached for her consent to participate in the study.

I agree that the primary researcher, Ms Diana Clarke, will inform my attending physician of my participation in the study. I also agree that Ms Clarke may have access to my medical records while in the hospital and that she may contact my physician for information concerning my recovery.

I understand that my participation is voluntary and that I may withdraw from the study at any time, for any reason, with no penalty. Withdrawal from the study will not in any affect my usual treatment. I also understand that I may refuse to answer any questions if I so wish.

I understand that all information collected in the course of the study is confidential and may only be shared with the staff involved directly with the study. The information gathered during the study will be used for research purposes; however, any details that my reveal my identity will be excluded from research reports.

I, _____, have read the above

information sheet and have been informed about the nature

of the study by _____ and consent to

participate in it. A copy of this agreement has been

provided to me.

_____   _____
SIGNATURE   DATE

_____
WITNESS

APPENDIX B

CONSENT FORM - SPOUSE

I have read and understand the above information about the study of post-MI recovery. I understand the study procedure, including questionnaires while my spouse is still in the hosptial and questionnaires at three and twelve months post-MI. I also understand the home interview procedure at three and twelve months post-MI.

I understand that my participation is voluntary and that I may withdraw from the study at any time, for any reason, with no penalty. I may also refuse to answer any questions should I wish to do so. Withdrawal from the study will not in any way affect my spouse's usual treatment.

I understand that all information collected in the course of the study is confidential and amy only be shared with the staff involved directly with the study. The information gathered during the study will be used for research purposes; however, any details that may reveal my identity will be excluded from research reports.

I, _____, have read the above

information sheet and have been informed about the nature

of the study by _____ and consent to

participate in it. A copy of this agreement has been

provided to me.

_____   _____
SIGNATURE   DATE

_____
WITNESS

APPENDIX C

SEMI-STRUCTURED IN-HOSPITAL INTERVIEW

(Approached and phrased individually for each patient)

1. How are you feeling today?

2. How have your feelings changed since the heart attack?

3. What are your thoughts about the future?

4. Have you been worried about your health in the past?

5. Are you worried about how your family is going to manage? handle this crisis?

6. Will you be worried about your health in the future? worried about another heart attack?

7. Have you thought about/are you worried about death?

8. Have you had feelings of hopelessness/depression/sadness at any time since the heart attack?

9. How do you think you will approach the life-style changes necessary in the future?

Based on these questions, the patient's affect and attitude during the interview, and collateral information from nursing staff, the interviewer rates, on a scale from 1 to 10, how distressed the subject is.

APPENDIX D

<u>Influential Relationships Questionnaire</u>

With reference to your wife, please answer the following
questions by checking the appropriate brackets, indicating
whether the statement is very like her actions and attitudes
towards you, moderately like her, moderately unlike her, or
very unlike her.

		very like	moderately like	moderately unlike	very unlike
1.	Speaks to me with a warm and friendly voice.	( )	( )	( )	( )
2.	Does not help me as much as I need.	( )	( )	( )	( )
3.	Often criticizes me.	( )	( )	( )	( )
4.	Lets me do those things I like doing.	( )	( )	( )	( )
5.	Seems emotionally cold to me.	( )	( )	( )	( )
6.	Appears to understand my problems and worries.	( )	( )	( )	( )
7.	Does not want me to "grow up".	( )	( )	( )	( )
8.	Likes me to make my own decisions.	( )	( )	( )	( )
9.	Is affectionate to me.	( )	( )	( )	( )
10.	Seldom disapproves of my behaviour.	( )	( )	( )	( )
11.	Gets angry at me for no reason.	( )	( )	( )	( )
12.	Does not resent me.	( )	( )	( )	( )
13.	Tries to control everything I do.	( )	( )	( )	( )
14.	Invades my privacy.	( )	( )	( )	( )
15.	Enjoys talking things over with me.	( )	( )	( )	( )

16. Makes me feel rejected. ( )   ( )   ( )   ( )

17. Frequently smiles at me.( )   ( )   ( )   ( )

18. Points out my weakness ( )   ( )   ( )   ( )
    rather than praising
    me.

19. Does not seem to   ( )   ( )   ( )   ( )
    understand what I
    want or need.

20. I seldom feel s/he   ( )   ( )   ( )   ( )
    dislikes me.

21. Lets me decide things ( )   ( )   ( )   ( )
    for myself.

22. Makes me feel I am   ( )   ( )   ( )   ( )
    not wanted.

23. Talks about my illness ( )   ( )   ( )   ( )
    in a way that upsets me.

24. Can make me feel better ( )   ( )   ( )   ( )
    when I am upset.

25. Does not talk with me   ( )   ( )   ( )   ( )
    very much.

26. Puts me down.   ( )   ( )   ( )   ( )

27. Tries to make me   ( )   ( )   ( )   ( )
    dependent on him/her.

28. Feels I cannot look   ( )   ( )   ( )   ( )
    after myself unless
    s/he is around.

29. Does not make me   ( )   ( )   ( )   ( )
    nervous.

30. Gives me as much   ( )   ( )   ( )   ( )
    freedom as I want.

31. Does not pick on me   ( )   ( )   ( )   ( )
    when I am ill.

32. Lets me go out as   ( )   ( )   ( )   ( )
    often as I want.

33. Is overprotective of   ( )   ( )   ( )   ( )
    me.

34. Tends to "baby" me.   ( )   ( )   ( )   ( )

APPENDIX E

SELF-EFFICACY SCALE

The attached form describes various activities and tasks.
Under the column marked "can do", check the tasks or
activities you expect you can do NOW.

For the tasks you check under "can do", indicate in the
column marked "confidence" how confident you are that you
can do the task NOW. Rate your degree of confidence using a number
from 10 to 100 on the scale below:

```
   10    20    30    40    50    60    70    80    90    100
 quite                   moderately                    certain
uncertain                 certain
```

Remember, rate what you expect you could do and your
confidence you can do it NOW. Even if some of the
activities or situations do not seem to apply to you, try
to imagine them and answer as if they were applicable.

```
LIFTING OBJECTS                        Can do    Confidence

Lift a 10 pound object                 _____    _____
Lift a 20 pound object                 _____    _____
Lift a 30 pound object                 _____    _____
Lift a 40 pound object                 _____    _____
Lift a 50 pound object                 _____    _____
Lift a 60 pound object                 _____    _____
Lift a 70 pound object                 _____    _____
Lift a 80 pound object                 _____    _____
Lift a 100 pound object                _____    _____
Lift a 150 pound object                _____    _____
Lift a 175 pound object                _____    _____
```

GENERAL EXERTION

```
Capable of very light exertion         _____    _____
Capable of light exertion              _____    _____
Capable of moderate exertion           _____    _____
Capable of hard exertion               _____    _____
Capable of very hard exertion          _____    _____
Capable of extreme exertion            _____    _____
```

HEART RATE: The following are the usual beats per minute (BPM) for d
              levels of activity.
              Resting: 70 BPM
              Moderate activity: 115 BPM
              Strenuous activity: 160 BPM

```
                                       Can do    Confidence
Tolerate a HR of 90-110 BPM for:
     5 minutes                         _____    _____
    10 minutes                         _____    _____
    15 minutes                         _____    _____
    20 minutes                         _____    _____

Tolerate a HR of 110-120 BPM for:
     5 minutes                         _____    _____
    10 minutes                         _____    _____
    15 minutes                         _____    _____
    20 minutes                         _____    _____
```

Tolerate a HR of 121-130 BPM for:
    5 minutes   _____   _____
    10 minutes   _____   _____
    15 minutes   _____   _____
    20 minutes   _____   _____

Tolerate a HR of 131 + BPM for:
    5 minutes   _____   _____
    10 minutes   _____   _____
    15 minutes   _____   _____
    20 minutes   _____   _____

WALKING	Can do	Confidence
Walk 1 block (approx. 5 minutes)	_____	_____
Walk 2 blocks (10 minutes)	_____	_____
Walk 3 blocks (15 minutes)	_____	_____
Walk 4 blocks (20 minutes)	_____	_____
Walk 5 blocks (25 minutes)	_____	_____
Walk 1 mile (30 minutes)	_____	_____
Walk 2 miles (60 minutes)	_____	_____
Walk 3 miles (90 minutes)	_____	_____

JOGGING

Jog 1 block (approx. 2 minutes)	_____	_____
Jog 2 blocks (4 minutes)	_____	_____
Jog 3 blocks (6 minutes)	_____	_____
Jog 4 blocks (8 minutes)	_____	_____
Jog 5 blocks (10 minutes)	_____	_____
Jog 1 mile (12 minutes)	_____	_____
Jog 1.5 miles (18 minutes)	_____	_____
Jog 2 miles (24 minutes)	_____	_____
Jog 3 miles (36 minutes)	_____	_____

CLIMBING	Can do	Confidence
Walk up several steps	_____	_____
Walk up 1 flight of steps	_____	_____
Walk up 2 flights of steps	_____	_____
Walk up 3 flights of steps	_____	_____
Walk up 4 flights of steps	_____	_____

PUSHING/MOVING THINGS

Move a light object (kitchen chair)	_____	_____
Move a medium weight object (coffee table)	_____	_____
Move a fairly heavy object (arm chair)	_____	_____
Move a heavy object (sofa, bed)	_____	_____

SEX *

	Can do	Confidence
1-5 minutes	_____	_____
6-10 minutes	_____	_____
11-15 minutes	_____	_____
16-20 minutes	_____	_____
More than 20 minutes	_____	_____

*This item does not mean that any given length of intercourse is desirable from a psychological or physical standpoint. The time spans mentioned do not take account of the quality of a sexual experience and are not meant as prescriptions.

DRIVING

	Can do	Confidence
Drive a few blocks in neighborhood	_____	_____
Drive around in residential areas	_____	_____
Drive on a downtown business street	_____	_____
Drive on a main arterial road	_____	_____
Drive on a freeway	_____	_____
Drive on narrow mountain roads	_____	_____

TOLERANCE OF EMOTIONAL TENSION AND STRESS

Can tolerate mild tension	_____	_____
Can tolerate some tension	_____	_____
Can tolerate moderate tension	_____	_____
Can tolerate substantial tension	_____	_____
Can tolerate much tension	_____	_____

TOLERANCE OF ANGER AROUSAL

Can tolerate mild anger	_____	_____
Can tolerate some anger	_____	_____
Can tolerate moderate anger	_____	_____
Can tolerate substantial anger	_____	_____
Can tolerate a great deal of anger	_____	_____

EMOTIONAL STRAIN

Listed below are situations that can arouse anxiety, annoyance and anger. Imagine the feelings you might have in each situation, such as your heart beats faster and your muscles tense. Indicate whether you could tolerate now the emotional strain caused by each of the situations.

	Can do	Confidence
Attend a social gathering at which there is no one you know	____	____
At a social gathering, approach a group of strangers, introduce yourself, and join in the conversation	____	____
Be served by a salesperson, receptionist, waiter whose behavior you find irritating	____	____
In a public place, ask a stranger to stop doing something that annoys you, such as cutting in line, smoking	____	____
In a meeting at work, respond to a colleague who tries to make you look bad	____	____
When very angry let yourself "fly off the handle"	____	____

FAMILY DISAGREEMENTS

Disagreement with one's spouse can produce emotional strain. Indicate whether you can tolerate the stress caused by a clash of views in each of the areas listed.

	Can do	Confidence
Friends	____	____
Work or outside activities	____	____
Family finances	____	____
Child care and parenting	____	____
Sex relations	____	____
Diet	____	____

APPENDIX F

Family APGAR

Please check the appropriate space after each statement.

	Almost always	Some of the time	Hardly ever
I am satisfied with the help I receive from my family when something is troubling me	___	___	___
I am satisfied with the way my family discusses items of common interests and shares problem-solving with me	___	___	___
I find that my family accepts my wishes to take on new activities or make changes in my life-style	___	___	___
I am satisfied with the way my family expresses affection and responds to my feelings such as anger, sorrow, and love	___	___	___
I am satisfied with the amount of time my family and I spend together	___	___	___

APPENDIX G
SPECIFIC ACTIVITY SCALE

Please circle the most appropriate response and then
follow the instructions after your chosen response.

1. Can you walk down a flight of steps without stopping?

        a) Yes --> Go to #2

        b) No   --> Go to #4

2. Can you carry anything up a flight of 8 steps <u>without
stopping</u>?

        a) Yes --> Go to #3

        b) No   --> Can you:

  i) Have sexual intercourse without stopping?

        a) Yes --> Go to #3

        b) No   --> Can you:

  ii) Garden, rake, or weed?

        a) Yes --> Go to #3

        b) No   --> Can you:

  iii) Roller skate, dance foxtrot?

        a) Yes --> Go to #3

        b) No   --> Can you:

  iv) Walk at 4 miles per hour on level ground?

        a) Yes --> Go to #3

        b) No   --> Go to #4

3. Can you carry at least 24 pounds up 8 steps?

        a) Yes --> Thank you. You've finished!

        b) No   --> Can you:

  i) Carry objects that are at least 80 pounds?

        a) Yes --> Thank you. You've finished!

        b) No   --> Can you:

ii) Do outdoor work: Shovel snow, spade soil?

    a) Yes --> Thank you. You've finished!

    b) No   --> Can you:

iii) Do recreational activities such as skiing, basket ball, squash?

    a) Yes --> Thank you. You've finished!

    b) No   --> Can you:

iv) Jog/walk 5 miles per hour?

    a) Yes --> Thank you. You've finished!

    b) No   --> Go to #4

4. Can you shower without stopping?

    a) Yes --> Thank you. You've finished!

    b) No   --> Can you:

i) Strip and make a bed?

    a) Yes --> Thank you. You've finished!

    b) No   --> Can you:

ii) Walk 2.5 miles per hour?

    a) Yes --> Thank you. You've finished!

    b) No   --> Can you:

iii) Bowl?

    a) Yes --> Thank you. You've finished!

    b) No   --> Can you:

iv) Play golf (walk and carry clubs)?

    a) Yes --> Thank you. You've finished!

    b) No   --> Can you:

v) Push power lawn mower?

    a) Yes --> Thank you. You've finished!

5. Can you dress without stopping because of symptoms?

      a) Yes

      b) No

Thank you. You've finished! Thank you for your help!

APPENDIX H

PSYCHOSOCIAL ADAPTATION TO ILLNESS SCALE

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APPENDIX I
ZUNG ANXIETY SCALE

Instructions: Put a check-mark in the space next to each item to show how often you have had this feeling during the last week.

Your feelings

		None of the time	some of the time	good part of the time	All of the time
1.	I feel more nervous and anxious than usual.	___	___	___	___
2.	I feel afraid for no reason at all.	___	___	___	___
3.	I get upset easily or feel panicky.	___	___	___	___
4.	I feel like I'm falling apart and going to pieces.	___	___	___	___
5.	I feel that everything is all right and nothing bad will happen.	___	___	___	___
6.	My arms and legs shake and tremble.	___	___	___	___
7.	I am bothered by headaches, neck and back pains.	___	___	___	___
8.	I feel weak and get tired easily.	___	___	___	___
9.	I feel calm and can sit still easily.	___	___	___	___
10.	I can feel my heart beating fast.	___	___	___	___
11.	I am bothered by dizzy spells	___	___	___	___
12.	I have fainting spells or feel like it.	___	___	___	___
13.	I can breathe in and out easily.	___	___	___	___
14.	I get feelings of numbness and tingling in my fingers, toes.	___	___	___	___
15.	I am bothered by stomache aches or indigestion.	___	___	___	___
16.	I have to empty my bladder often.	___	___	___	___
17.	My hands are usually dry and warm.	___	___	___	___
18.	My face gets hot and blushes.	___	___	___	___
19.	I fall asleep easily and get a good night's sleep.	___	___	___	___
20.	I have nightmares.	___	___	___	___

APPENDIX J
ZUNG DEPRESSION SCALE

	Your feelings	None of the time	Some of the time	Good part of the time	All of the time
1.	I feel downhearted, blue, and sad.	___	___	___	___
2.	Morning is when I feel the best.	___	___	___	___
3.	I have crying spells or feel like it.	___	___	___	___
4.	I have trouble sleeping through the night.	___	___	___	___
5.	I eat as much as I used to.	___	___	___	___
6.	I enjoy looking at, talking to, and being with attractive men/women.	___	___	___	___
7.	I notice that I am losing weight.	___	___	___	___
8.	I have trouble with constipation.	___	___	___	___
9.	My heart beats faster than usual.	___	___	___	___
10.	I get tired for no reason.	___	___	___	___
11.	My mind is as clear as it used to be.	___	___	___	___
12.	I find it easy to do the things I used to.	___	___	___	___
13.	I am restless and can't sleep.	___	___	___	___
14.	I feel hopeful about the future.	___	___	___	___
15.	I am more irritable than usual.	___	___	___	___
16.	I find it easy to make decisions.	___	___	___	___
17.	I feel that I am useful and needed.	___	___	___	___
18.	My life is pretty full.	___	___	___	___
19.	I feel that others would be better off if I were dead.	___	___	___	___
20.	I still enjoy the things I used to.	___	___	___	___

APPENDIX K

A CORONARY PROGNOSTIC INDEX

	Score			Score

Sex and Age:

Men:	54 or under 0	Women:	64 or under 2
	55-59 1		65 or over 3
	60-64 2		
	65 or over 3		

Previous history:

Previous cardiac infarct 6
Other cardiovascular diseases or history of exertional
       dyspnea   3
Angina only   1
No cardiovascular disease 0

Shock:

Absent 0
Mild - transient at onset 1
Moderate - prsent on admission but subsiding with rest
       and sedation 5
Severe - persisting despite rest and sedation 7

Failure:

Absent 0
Few basal rales only 1
Any one or more of the following: breathlessness, acute
       pulmonary oedema, orthopnea or dyspnea, gallop
       rhythm, liver enlargement, jugular vein distention 4

Electrocardiogram:

Normal QRS. Changes confined to R-T segment or T wave .. 1
QR complexes 3
QS complexes of bundle-branch block 4

Rhythm:

Sinus.. 0
Any one or more of the following: A.F., paroxy.tachycardia,
       persisting simple tachycardia, frequent E.S., nodal
       rhythm, or heart block 4

Total patient score = Prognostic index