Promoting the Inclusion of Psychosocial Factors in Cardiac Rehabilitation

Dawn Elizabeth Newberg
Loyola University Chicago

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PROMOTING THE INCLUSION OF PSYCHOSOCIAL FACTORS IN CARDIAC REHABILITATION

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DAWN ELIZABETH NEWBERG

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# TABLE OF CONTENTS

ACKNOWLEDGMENTS .......................................................... iii

Chapter

I. INTRODUCTION .............................................................. 1

II. REVIEW OF THE LITERATURE ......................................... 5

   Discussion of CHD Risk Factors ...................................... 5
   Type A Personality Pattern ........................................... 5
   Smoking Behavior ...................................................... 10
   Sedentary Lifestyle .................................................... 12
   Poor Dietary Behavior ................................................... 15
   Negative Affect ........................................................... 16
   Discussion of Compliance Issues ..................................... 19

III. DISCUSSION OF FINDINGS AND IMPLICATIONS .................... 23

   Present Cardiac Rehabilitation Program Format ................. 24
   Creating a Wellness Program ......................................... 26
   Wellness Program: Phase I ............................................. 31
   Wellness Program: Phase II ............................................. 33
   Wellness Program: Phase III .......................................... 34

IV. SUMMARY ..................................................................... 36

BIBLIOGRAPHY ............................................................... 39

VITA ................................................................................. 52
CHAPTER I
INTRODUCTION

Coronary heart disease (CHD) remains one of the most prominent and preventable causes of death today due the psychosocial nature of many of its etiologic agents. Current treatment for cardiac patients operates on a primarily physical level, often failing to sufficiently address vital psychosocial cardiovascular risk factors in cardiac rehabilitation programs. The review of literature concerning current cardiac rehabilitation issues suggests that cognitive-behavioral changes used in multi-component, individualized cardiac rehabilitation programs may enable CHD patients to decrease secondary coronary events by lowering susceptibility to dangerous psychosocial cardiovascular risk factors.

CHD can be seen as a "disorder of lifestyle," and many of its etiologic agents are potentially modifiable (Krantz, Contrada, Hill & Friedler, 1988). Controlling alterable (read: psychosocial) CHD risk factors may well be the most effective way to maintain and promote long-term cardiac health. Although a growing body of research shows that although long-term cardiac rehabilitation outcome depends to a great deal on psychosocial determinants which are often more important than medical variables, the current practice in cardiac rehabilitation does not sufficiently recognize that fact (Myrtek & Welsch, 1990). The purpose of cardiac rehabilitation is, after all, to "facilitate readaptation to normal life through the achievement of maximal functional capability and to reduce heart disease risk factors" (Pashkow, 1993). Why, then, is the inclusion of psychosocial factors in cardiac rehabilitation, which
are obviously consistent with the primary goals of cardiac rehabilitation, often overlooked or devalued in current cardiac rehabilitation programs?

Although voluminous medical journals contain an extraordinary amount of articles about cardiac rehabilitation, few articles focus solely on the importance of integrating psychosocial components in cardiac rehabilitation programs. This is not to dispute the fact that most medical articles do, in fact, include some mention of one or more psychosocial components, especially certain psychosomatic-based journals. These articles will acknowledge the importance of the inclusion of certain psychosocial factors in cardiac rehabilitation and may even recommend treatment. However, it is apparent that the majority of medical doctors and researchers do not take the initiative to seriously venture into the potential benefits of psychosocial risk factors in cardiac rehabilitation and fail to implement appropriate treatment programs. This is significant because the innate physical nature of heart disease results in the development of cardiac rehabilitation programs by physical health professionals, not mental health professionals. Yet, mental health professionals, and some enlightened health professionals have continued to produce increasingly convincing studies that support the view that behaviorally modifiable psychosocial components contribute to heart disease. Taken together, these studies strongly advocate the inclusion of psychosocial factors in cardiac rehabilitation programs.

The literature has however tended to stay in its own domain. For instance, articles focusing on developing cardiac rehabilitation programs will tend to be found in medical, not psychological journals. Likewise, detailed review of psychosocial factors that contribute or are thought to contribute to heart disease generally do not venture into medical journals. Literature that
does combine medical knowledge with psychological interventions generally turns up in the growing fields of Behavioral Medicine, Health Psychology and Psychosomatic Medicine. Though these articles discuss the importance of incorporating psychosocial factors into physical health recovery systems in cardiac rehabilitation programs, few bother to expand on this concept in any practical format. Further, due to the wide range of factors which contribute to heart disease, there are few articles that detail any cardiac rehabilitation program model in a comprehensive scope. As a result, current cardiac programs lack the necessary support and funding to evolve to the basic level of care essential for improving and maintaining cardiac health.

Historically, research concerning cardiac rehabilitation focused on the importance of exercise following a cardiac event. Only the level or type of exercise came into question. Eventually, the medical community discovered that high cholesterol and high blood pressure played a significant role in contributing to CHD, and cardiac programs offered classes that taught patients how to eat healthy foods, and how to properly administer high blood pressure medications. The importance of implementing psychosocial components in cardiac rehabilitation programs first gained recognition from the early Type A Behavior Pattern (TABP) studies by cardiologists Friedman and Rosenman. Friedman and Rosenman used the TABP construct to describe a type of individual overrepresented in their clinical practice (Evans, 1990). Studies using the TABP construct soon claimed to show a strong connection between Type A behavior patterns and cardiac patients. Since that time, various other psychosocial factors have emerged which demand the attention of the medical and psychological fields.
In light of these findings, a bridge between the medical community and psychological community must be built in order to connect the extreme positions taken in the overwhelming research base pertaining to general cardiac health. Literature taken from psychological, medical and behavioral medicine fields is reviewed and surmised in this work to create a basis for a theoretical model of a comprehensive cardiac rehabilitation program. Several psychosocial factors related to CHD are presented. These factors are qualified as risk factors for CHD with a detailed summary. In turn, particular psychological interventions are recommended which are theorized to counter the psychosocial risk factors thereby lowering risk for heart disease. In addition, problematic compliance and motivational issues common among cardiac rehabilitation patients are addressed. The resulting model of a comprehensive cardiac rehabilitation program is an idealized prototype which is intended to promote further research in the design and implementation of cardiac rehabilitation programs.
CHAPTER II

REVIEW OF THE LITERATURE

Discussion of CHD Risk Factors

Several psychosocial factors have been identified among commonly accepted risk factors for coronary heart disease. Unlike many physical risk factors, such as age and health histories, behavioral factors are alterable. Research can evidence that the reduction of risk factors decrease the overall risk of heart disease for cardiac patients (Dolbery, 1987). Addressing behavioral risk factors, therefore, can be vital to preventive cardiology (Pearson, 1987). The study of numerous epidemiological studies produced groupings of the following psychosocial risk factor categories: Type A personality behavior pattern (TABP), smoking behavior, sedentary lifestyle, poor dietary behavior, stress, and negative affect. These are all behaviorally modifiable risk factors that have continually shown a strong association with increased incidence of CHD. The effects of these psychosocial risk factors with respect to heart disease and the behavioral modification of these factors warrant further investigation by health professionals participating in the development and execution of cardiac rehabilitation programs.

Type A Personality Pattern

The original concept of Type A behavior proposed a global pattern of behaviors (hostility, aggressiveness, time urgency, and competitive achievement striving) that predispose individuals to coronary heart disease (Friedman & Rosenman, 1974). The Type A personality pattern concept has
since produced a flurry of articles resulting in contradictory findings regarding
the involvement of TABP as a CHD risk factor. The controversial findings of
the TABP studies and the heuristic nature of the TABP research resulted in
further studies of specific TABP components (such as degree of social
integration, hostility and anger) to assess their status as independent CHD risk
factors. Type B is the terminology used to distinguish persons with a noted
absence of Type A characteristics (Kaplan, 1992). Type B persons comprise a
population which is generally not prone to heart disease (Kaplan, 1992).
Although excessive studies have failed to prove that the presence of global
TABP results in CHD, it is clear that certain TABP characteristics in certain
populations offer support for Type A personality and its components to be
included among psychosocial risk factors for CHD. The general characteristics
of TABP are grouped under "Type A Behavior Pattern" risk factor category for
the sake of clarity only, and is not intended to imply a causal link between the
theorized global TABP and CHD.

Early studies, such as the Framingham Heart Study and the Belgian-
French Cooperative Heart Study, showed global TABP to be a good predictor
of CHD events among those adults not selected on the basis of CHD risk or
prior CHD exposure (Williams, 1987). The Framingham study used key
ratings from several psychosocial rating scales completed by males and females
which were grouped to form a Framingham Type A measure (Evans, 1990).
The Belgian-French Cooperative Heart Study used the Type-A scores from
the Bortner rating scale (Evans, 1990). The Western Collaborative Group
Study (WCGS) used a structured interview (SI) on a sample of over 3,000
Californian males initially free of CHD to assess the risk factor status of global
TABP (Jenkins, Zyzanksi & Rosenman, 1976). Although the WCGS found a
postive relationship between global TABP and CHD, a reanalysis of the SI data failed to reproduce that finding (Williams, 1987). No multivariate statistical analyses was done on these data, but when the first 62 cases of CHD in men were compared with a sample of 124 matched controls, the reanalysis showed higher scores, especially those related to hostility and anger on a number of measures of the SI (Williams, 1987). The WCGS prompted the development of the Jenkins Activity Survey (JAS), a questionnaire developed to assess TABP (Shekelle, Gale, & Norusis, 1985). The JAS Type A score measured in the last 4 years of the WCGS study showed that the JAS Type A mean score for 67 men with recurrent coronary events was significantly greater than that for 220 men with a single coronary event (4.34 vs. 0.55, respectively, p = .005). The results of the longitudinal Aspirin Myocardial Infarction Study which administered the JAS to over 2,000 post-myocardial subjects did not show any association with the Type A traits and increased risk of recurrent major coronary events no matter how the data were analyzed (Shekelle, Gale & Norusis, 1985). Studies using a high risk CHD population such as the Recurrent Coronary Prevention Project (RCCPP) and the Multiple Risk Factor Intervention Trial (MRFIT) also failed to qualify global TABP as a predictor for CHD. Interestingly, the RCCPP nevertheless succeeded in significant reductions in Type A behavior and a 44% reduction in reinfarction in post-myocardial infarction patients when a cognitive social learning model of behavior was applied (Mendes de Leon, Powell & Kaplan, 1991). Specifically, the Type A/Cardiac Counseling group in the RCCP study reported a significantly greater increase in self-efficacy scores (4.60 vs. 1.94, F = 27.44, p < .001), decrease in anger scores (0.62 vs. 0.13, F = 92.34, p < .001 and a
significantly larger reduction in self-reported depression scores than the control group (2.41 vs. 1.34, F = 13.10, p < .001).

A smattering of views concerning the components of hostility and anger in the TABP definition are inherent in most arguments regarding the TABP's status as a CHD risk factor. The hostility factor in global Type A/B designation may, in fact, account for the variation in the strength of association between TABP and CHD among various studies. (Dembroski, MacDougall, William, Haney & Blumenthal, 1985). The Type A Cognitive Questionnaire (TACQ) scores showed a significant association between Type A belief with anger/hostility (r = .58, p < .0001) for both men and woman combined (Watkins, Fisher, Southard, Ward & Schechtman, 1989). There is some evidence that anger and aggression may also act as risk factors for CHD (Matsumoto, Uyama, Shimizu, Michishita, Mori, Owada & Sugita, 1993). Scores of the Cook-Medley Hostility (Ho) scale from the Minnesota Mutiphasic Personality Inventory (MMPI) have been positively associated as a significant factor for predicting the development of CHD in several studies (Williams, 1987). The status of the Ho score as an independent risk factor have since been disputed by a 20-year follow-up study of over 600 general medical patients who had completed the MMPI when the other risk factors were also considered (p = .038 for the Ho score alone, p = .339 when adjusted for age and sex, and p = .360 when adjusted for age, sex, hypertension and relative weight) (Maruta, Hamburgen, Jennings, Offord, Colligan, Frye & Malinchoc, 1993). Because preceding studies using the Ho scale have predicted CHD when controlled for risk factors such as age, cigarette smoking, blood pressure and serum cholestrol level, the Maruta, et al study remains controversial. Further, the univariate Ho score in the study
was in fact a significant factor in predicting CHD and CHD-related mortality (Maruta, et al, 1993).

Orth-Gomer & Unden (1990) found that social support (degree of social integration) proved to be the best psychosocial discriminator between Type A survivors and nonsurvivors of CHD. The results of a longitudinal study of Type A and Type B cardiac patients by Orth-Gomer & Unden (1990) suggested that only if hostile and impatient attitudes are accompanied by social disintegration and social isolation does a negative effect on a Type A person's prognosis and survival become clinically manifest. The 10-year mortality experience of socially isolated Type A men was 69% and that of socially integrated Type A men was 17% (p < 0.05) (Orth-Gomer & Unden, 1990). Type A persons report fewer close friends which may have a heightening effect on Type A traits such as anger and hopelessness. Based on these findings, it appears that the main effects of Type A behavior modification programs on cardiovascular disease may be related to increased availability of social support. It could be argued that the Type A behavior characteristics were predecessors to the lack of social integration in the first place, and strong Type A personalities incapacitate the ability to make and enjoy personal relationships to such a degree that this social impairment jeopardizes a Type A person's physical health and well-being.

Berenberg (1987) found support for a type-similarity hypothesis which theorized that Type A affiliations intensify and maintain Type A traits, and Type B affiliations intensify and maintain Type B traits. The means of this study showed that the Type A stimulus person was rated more positively by Type A participants (4.7, SD = 1.2) than by Type B participants (3.9, SD = 1.0), whereas the Type B stimulus person was rated more positively by Type B
participants (4.3, SD = .91) than by Type A participants (3.5, SD = .96) (Berenberg, 1987). This finding suggests that an individual's social milieu, then, may play a significant role in reducing or increasing CHD risk. Type A behavior trait modification may enable persons with TABP to increase the quantity and quality of their social relationships by reducing such barriers as hostility, aggression and competitiveness. This suggestion would be consistent with Orth-Gormer & Unden (1990) findings that social isolation is more detrimental in Type A than in Type B persons.

In the final analysis, whether or not TABP is a verifiable global risk factor for CHD, it certainly deserves consideration because it encompasses some measurable characteristics that are closely related to other potential risk factors (i.e. social isolation and hostility) that may clue future research into more definitive causes of CHD. Multimodal assessment over time seems to be the most productive route to this end. This research will enable future programs to include directive treatment strategies in cardiac rehabilitation programs.

Smoking Behavior

Cigarette smoking has been identified as the single most important preventable cause of CHD. The Surgeon General of the United States documented smoking as a powerful and independent cause of CHD (Richmond, 1981). The smoking habit, however, can be behaviorally modified, and the physical effects of smoking can reverse to bring a former smoker almost to a health level of a nonsmoker over time (Orleans & Slade, 1993). The effects of smokeless tobacco and cigar smoking are also associated with high cardiac risk and can be treated with similar treatment methods used for cigarette smokers (Orleans & Slade, 1993).
Eysenck (1988) claimed smoking and personality affect disease synergically. The relationship of smoking to psychological and physiological risk factors for such diseases as CHD spurred much interest. Research showed that smoking may not be an independent risk factor to CHD, and any contribution smoking may have on CHD could be a result of the interaction of several background psychological and physiological risk factors for CHD (Grossarth-Maticek, Eysenck, & Vetter, 1988; Kreitler, Weissler, Kreitler & Brunner, 1991). Specifically, stress (Epstein & Perkins, 1988) and depression (Hall, Munoz, Reus & Sees, 1993) have been cited as preludes to smoking behavior or relapse from smoking cessation. Taken further, the idea that smoking is synergically linked to psychosocial and physical factors suggests that the frequency of relapse in smoking cessation programs is due to the general disregard in characterizing smokers by psychological and physiological dimensions. Other researchers have supported this notion. Smokers who relapsed within 6 months or later of a heart attack may have a tendency to experience increased anxiety, depression and decreased knowledge and understanding of smoking as a CHD risk factor. Early relapsers in a study conducted by Havik & Maeland (1988) had less cardiac health knowledge than short-term quitters and the main group effect of short-term smoking status was statistically significant for scales of Basic Cardiac Knowledge (F(1, 199) = 4.97, p = .02), Cardiac Lifestyle, (F(1, 199) = 8.78, p = .004), and Cardiac Misconceptions (F(1,199) = 9.73, p = .002). Havik and Maeland (1988) suggested that training in coping with negative affects without smoking may be valuable in promoting smoking cessation.

The American Psychiatric Association (1996) practice guidelines for treating nicotine dependent patients support the use of multi-modal behavior
therapies for those smokers who are unsuccessful in quitting due to reasons other than nicotine withdrawal symptoms. The effects of smoking are reversible, and current studies in smoking cessation have shown that cardiac rehabilitation patients who quit smoking can reduce the risk of another myocardial infarction by as much as 50% (Orleans & Slade, 1993).

Unfortunately, although most cardiac patients quit smoking for a time following a myocardial infarction, more than half resume smoking within just three months. Behavior modification, then, should be implemented to produce better rates of long-term quitters of smoking and therefore a reduction in smokers' risks for CHD (Kreitler, Weissler, Kreitler & Brunner, 1991).

The necessity of quitting smoking behavior is well documented. The APA (1996) has stated that smoking cessation is much more important than changing diet, weight or exercise for persons at risk for CHD. There are several approaches to treatment of smoking behavior. Overall, the use of several pharmacological therapies such as nicotine gum plus a nicotine patch combined with appropriate cognitive behavioral based programs or therapies seem to be the most effective path towards long-term cessation and maintenance (APA, 1996). Social support is also indicated as beneficial but lacks evidence as an independent predictor of successful smoking cessation (APA, 1996). Smoking cessation should focus on the development of behavioral modification approaches for increased success in helping smokers quit and remain nonsmokers.

Sedentary Lifestyle

The term "sedentary lifestyle" is used in this work to globally identify physically and/or socially inactive cardiac patients. The lack of exercise and
general social activity associated with a sedentary lifestyle have been shown to be significant CHD risk factors. This type of lifestyle can lead to obesity (resulting from poor dietary behavior) and negative affect (resulting from a lack of social integration).

Epidemiologic literature fails to clearly disconfirm or confirm whether or not exercise will prevent CHD (Kaplan, 1988). However, the effects of exercise on cardiac health are generally very favorably accepted by the medical community, and various studies continue to show support for exercise components in effective cardiac rehabilitation programs. The basis for this support is well-grounded. Exercise is generally associated with lower death rates from all causes, and incidence of serious complications in supervised exercise programs are extremely rare (Kaplan, 1988).

In one 3 year overview of 36 randomized trials of cardiac rehabilitation programs with exercise components, O'Connor, Buring, Yusuf, Goldhaber, Olmstead, Paffenbarger & Hennekens (1989) reported a reduction of about 20% in total and cardiovascular-related mortality over programs lacking exercise components. Odds ratios (OR) and a 95% confidence interval were used in the O'Connor study for endpoints of total mortality for combined trials. After the 3 years of follow up, rehabilitation ORs were significantly lower than those of the comparison group for measures of total mortality (OR = .80 [.66, .96]), cardiovascular mortality (OR = .78 [.63, .96]) and fatal reinfarction (OR = .75 [.59, .95]). Hertanu, Davis, Focseneanu & Lahman (1986) found that postexercise results of a 3 month rehabilitation exercise program produced improved exercise and work tolerance and earlier return to work. In addition, 87% of the patients reported a decrease in frequency and severity of angina and improved tolerance of daily activities (Hertanu, et al., 1986).
Promoting exercise seems to be an obvious method of combating physical inactivity in a cardiac rehabilitation program, but the debate over its benefits to cardiac patients continues. The physiological effects of exercise may be secondary to the psychological effects in improving health (Martin & Dubbert, 1982). Although uncontrolled studies often describe substantial improvements in psychological well-being in relation to cardiac exercise programs designed to improve physical health, randomized, controlled studies report that the effect of exercise on psychological well-being has been unimpressive (Greenland & Chu, 1988). There is research that suggests relaxation techniques for cardiac patients may be more important and effective than exercise. Van Dixhoorn, Duivenvoorden, Staal, & Pool (1989) found that while exercise training was not beneficial in all myocardial infarction patients, relaxation therapy produced higher compliance to cardiac rehabilitation programs and enhanced overall training benefit. Fitts & Howe (1987) found that leisure time was comprised of a narrower range of activities and a less balanced relationship between relaxation and active pursuits in cardiac patients compared to noncardiac patients. Noncardiac groups had higher means for participation in relaxation activities (17.6, SD = 4.55 vs. 16.46, SD = 6.84), physical activities (6.27, SD = 3.41 vs. 5.47, SD = 4.16), social activities (6.38, SD = 2.52 vs. 4.50, SD = 4.18) and other leisure activities (2.34, SD = 2.92 vs. 1.27, SD = 3.55) when compared to cardiac groups (Fitts & Howe, 1987).

Conflicting and inconclusive studies concerning the effects of exercise on cardiac rehabilitation may result in part from the lack of compliance to exercise programs which make it difficult to interpret or obtain solid data. Predictors of noncompliance to exercise programs include smoking behavior
and incidence of angina (Blumenthal & Emery, 1988). Martin & Dubbert (1982) investigated various studies addressing the benefits of exercise, particularly to patient populations, and the problem of poor adherence to exercise programs, and suggest that our efforts might best be directed to ensuring the successful long-term adherence of those patients who are most likely to remain in treatment.

Fitts & Howe (1987) noted that cardiac patients demonstrated a narrower range of leisure-based activities and a lack of significant social involvement than non-cardiac patients. Further, cardiac patients interpreted their leisure time as highly satisfactory, which could cause obstacles in motivating these patients towards participation in tension reducing activities like physical and social activities (Fitts & Howe, 1987). These findings suggest that appropriate social integration can be an important lifestyle change for cardiac patients.

The special needs of sedentary cardiac patients require additional methods to improve lifestyle habits. Behavioral modifications that focus on nutrition and weight control should be employed in cardiac rehabilitation programs in conjunction with the exercise programs for the sedentary patient. The sedentary patient will also benefit from increased quality social interaction.

Poor Dietary Behavior

Cardiac rehabilitation patients who lead sedentary lifestyles are especially prone to CHD risk factors related to poor dietary habits. Even active persons who neglect a nutritious and appropriately portioned diet are at risk for CHD. Poor dietary behavior contributes to high physical CHD risk factors such as hypertension (linked to diet sodium intake), hypercholesterolemia
(linked to dietary fat and cholesterol) and obesity, which exacerbates both conditions (Jeffrey, 1988). Next to smoking, serum cholesterol and high blood pressure are perhaps the most widely accepted CHD risk factors (Krantz, Contrada, Hill & Friedler, 1988). All of these factors can be controlled or eliminated by diet modification and behavioral changes.

Obesity generally results from excessive eating behavior, a high fat and refined sugar dietary composition, insufficient exercise, or a combination thereof (Jeffrey, 1988). Treatment for obesity is sought more due to its status as a social stigma rather than for health reasons. Weight control, then, has been studied extensively from a mental health perspective while the physical CHD risk factors of hypertension and hypercholesterolemia, largely resulting from elevated dietary risk factors, have traditionally been viewed from a clinical perspective (Jeffrey, 1988). The Coronary Drug Project and the MRFIT have shown that the lowering of cholesterol intake produces long-term benefits in fighting CHD (Gotto, 1991). There are no available drugs to counter high cholesterol intake. Therefore, it is the patient's responsibility to modify eating behavior to lower cholesterol intake. Hypertension has shown in numerous studies to be directly proportional to body weight increases and decreases, and, to a lesser but significant degree, related to sodium intake (Jeffrey, 1988). Medications have proven successful in treating hypertension, but since the patient cannot directly experience concrete, positive health changes, there is a problem of adherence to taking the medications (Jeffrey, 1988).

Clinical and behavioral treatment methods for diet and weight control respectively, share initial success followed by future failure to maintain results (Jeffrey, 1988). Cooperation and participation in a dietary modification
program by familial support systems has been strongly implicated for increased success by the patient in adherence to new eating behaviors (Fletcher, 1992). The need for successful treatment of these risk factors in cardiac rehabilitation programs remains, and research in this area should be directed to improving current behavioral weight control programs, increasing behavioral modification methods in clinical approaches and, most importantly, addressing the need for increased compliance of patients to programs in these high-risk categories.

Negative Affect

Negative affect in this work is loosely used as a general term to include depression and stress. Such emotional problems have been shown to contribute to increased risk of mortality in cardiac patients (Blumenthal & Emery, 1988).

Depression is overrepresented in the smoking population, and smokers who are depressed experience higher failure rates quitting smoking than non-depressed smokers (Hall, et al., 1993). Smokers who report intensified depression with or following cessation may require psychological and/or pharmacotherapy (APA, 1996). Based on this treatment indication, management of depression may also be an integral component in comprehensive cardiac rehabilitation programs. More research is necessary to determine if other CHD risk factors are also partially or wholly based upon the compelling need of CHD patients to manage negative affect or depression.

Stress also seems to play an important role in contributing to CHD. Various animal model studies have demonstrated causal relationship between psychosocial stress on coronary disease pathology (Krantz, et al., 1988). Hypertension, a well-accepted cardiac risk factor, is also linked to stress.
Abnormally high blood pressure and heart rate responses to behavioral stress have been implicated in the etiology of cardiovascular diseases (Matthews, Weiss, Dembroski, Falkner, Manuck & Williams, 1986). Exaggerated blood pressure responses during times of stress are especially common in young adults at risk for hypertension and CHD (McCubbin, Wilson, Bruehl, Ibarra, Carlson, Norton & Colclough, 1996). Yet, there are negligible findings to support stress itself as a CHD predictor. Hendrix, Steel, Leap & Summers (1991) found stress to be a key component in individual health, job satisfaction, organizational commitment, performance and absenteeism, but findings failed to support job or life stress as a CHD risk factor (correlations ranged from . But stressors may promote smoking behavior, which has consistently been found to be a predictor for CHD. Psychological stressors tend to increase smoking behavior in current smokers, and cause relapse in smoking cessation attempts (Epstein & Perkins, 1988). The ubiquitous nature of stress necessitates a focus on a study of possible ways to counteract constant everyday stressors as well as chronic stressors for purposes of formulating successful stress reduction techniques.

There are several ways for the health professional to address stress in cardiac rehabilitation therapy. Stress in cardiac patients can be reduced by employing simple, yet effective coping mechanisms such as relaxation therapy (Van Dixhoorn, et al., 1989). Van Dixhoorn, et al. (1989) found that the risk of failure at exercising was reduced by half when relaxation was added to exercise training (odds of failure for exercise plus relaxation therapy were calculated at .25; odds for failure for exercise only was .51; odds ratio: 2.04; 95% confidence interval, 0.94 to 4.6). Specifically, relaxation training may produce decreased diastolic blood pressure reactivity

Many studies have shown the effects of psychosocial stressors to depend on the demands on the individual and the perception or interpretation of these demands (Krantz, et al., 1988). Therefore, group or individual therapy sessions instructing patients how to utilize cognitive reframing techniques could also prove helpful in stress-reduction.

Discussion of Compliance Issues

The risk factors for CHD are well-documented but treatment plans lack the compliance necessary to secure accurate data and elicit long-term change in participants. Several measures of compliance have been considered, including emotional states such as anxiety and depression and cognitively based factors such as attitudes about health (Lynch, Birk, Weaver, Gohara, Leighton, Repka & Walsh, 1992). The initial level of adherence is also cited as a strong predictor of long-term adherence (Sherbourne, Hays, Ordway, DiMatteo & Kravitz, 1992).

The Health Belief Model hypothesizes that people will seek to avoid illness if they perceive the preventive action to be less negative than the illness itself (Lynch, et al., 1992). The core beliefs of the Health Belief Model include the susceptibility to illness or the negative consequences of illness, the severity of the condition that might result if the prescribed regimen is not followed, the benefits over costs of following the treatment plan, and the efficacy of the treatment. (Sherbourne, et al., 1992) Health beliefs regarding
hypercholesterolemia were found to be associated with adherence to a 26 week exercise program (Lynch, et al., 1992) at end of 26 week exercise program
health beliefs regarding hypercholesterolemia found to be associated with adherence by measures of belief in the seriousness or health risks associated with hypercholesterolemia ($r = .45, p < .02$) and the percentage of exercise sessions attended ($r = .50, p < .01$).

Other forces such as subjective norms and attitudes towards adherence may also impact on intention or commitment to carrying out a specific behavior (Sherbourne, et al., 1992). Attribution of control of health status to others or to chance lessens the likelihood of adherence to programs involving personal commitment or motivation. Lynch, et al., 1992 found that attribution of health status to powerful others or to chance is inversely related to adherence ($r = -.56, p < .01$ and $r = -.43, p < .02$, respectively). The Medical Outcomes Study (MOS) assessed 5 major areas that have consistently demonstrated value in explaining adherence: past behavior or habit, health perceptions, individual characteristics, presence of supports, and the prescribed behavior and quality of the practitioner-patient relationship. The great majority of correlations among variables in the study was weak (less than $r = .20$) (Sherbourne, et al., 1992). The largest correlation ($r = -.61$) between emotional well-being and health distress indicates that health perceptions may affect behavior (Sherbourne, et al., 1992). For instance, a person may believe that a certain action will lead to health, but will only be inclined to carry out that action if they value their health in the first place. The MOS also suggested that social aspects of a person's life can enhance the ability to carry out their intended health actions or make those actions more difficult to achieve. Health knowledge is also a prerequisite to cooperation.
Therefore, communication in the medical care process is widely perceived as important to the patient's understanding of the disease and treatment. (Sherbourne, et al, 1992).

Self-motivation has proven to be a good predictor of behavioral health outcomes. Clifford, Tan & Gorsuch (1991) found that self-motivation consistently correlated with reduced body fat ($r = .33-.45$), reduced health risk, $r = (.31$ to -.67) and reduced diastolic blood pressure ($r = .37$ to -.56).

Emotional support is widely cited as helpful in behavior modification, but generally often fails to predict overall maintenance of health outcomes. Still, quality social support and encouragement continually fosters better emotional status (such as lowered anxiety and depression), improve perceived quality of life, and improved compliance with recommended behaviors (Kulik & Mahler, 1993).

These and various other studies clue in to just a few of the factors impacting compliance. However, the relationship to long-term maintenance of behavior change in most studies is less clear over time. Self-report is one inexpensive and fairly reliable way to monitor behavior change. Morrell, King & Martin (1986) found self-report to be 96% accurate for smoking behavior among inpatients overall. Other studies have confirmed validity of self-reports as well. More data needs to be collected and studied to interpret factors that lead to adherence to health programs. Feedback and personal counseling have also enjoyed some success in promoting compliance towards behavior change. Feuerstein, Papciak, Shapiro & Tannenbaum (1989) found that a group receiving personalized intervention lost significantly more weight than the control group (30 lbs. vs. 11 lbs.) in a weight loss program. Also, retention rates were higher for the intervention group than the control group in the first 10 weeks of the program, even though pretreatment
motivation levels were higher in the control group at program initiation (90.6% and 74.6%, respectively) (Feuerstein, et al., 1989).

Finally, a stage model of behavioral change may be useful in promoting compliance and increasing motivation. Prochaska & DiClemente (Orleans & Slade, 1993) developed a model of cognitive and social learning constructs that has been applied to smoking cessation programs. The sequence of stages include precontemplation (not intending to make changes), contemplation (considering a change), preparation (making small changes), action (actively engaging in a new behavior) and maintenance (sustaining the change over time), and occasionally, relapse (fall back to a previous stage). The model is encouraging because adoption of behavior involves the initiation of a positive behavior for health promotion and disease prevention in general population rather than the elimination of a potentially harmful behavior such as smoking or weight loss (Marcus, Rakowski & Rossi, 1992).
CHAPTER III
DISCUSSION OF FINDINGS & IMPLICATIONS

Each psychosocial risk factor for CHD reviewed in the preceding pages - TABP, smoking behavior, eating behavior, sedentary lifestyle and negative affect - can be damaging to coronary health in its own right. The multiplicity of alterable CHD risk factors increases this danger. Common themes exist in these various risk factors that intensify an individual's susceptibility to several risk factors as well as common themes for treatment indications for reduction of particular risk factors. For instance, Type A individuals are prone to stress; hypertension is worsened with the presence of stressors; smoking behavior is often induced by stress; smoking behavior often occurs as a habitual response to stress; social isolation is often a component of sedentary lifestyle; Type A persons tend to be introverted; obesity exacerbates hypertension and hypercholesterolemia. Treatment indications overlap as well: Stress management techniques rely heavily on relaxation therapies; the latest smoking cessation techniques use cognitive-behavioral methods; smoking cessation often produces or increases an individual's negative affect; weight control is largely dependent on education and behavioral therapies; exercise is encouraged in weight control and management of stress; compliance and motivation are major barriers to treatment methods in smoking cessation, eating behavior and exercise. These risk factors are terribly interconnected, and require multicomponent treatment programs.
An adequate cardiac rehabilitation program should uphold a standard of care that is consistent with the multi-faceted needs of cardiac rehabilitation patients. A superior cardiac rehabilitation should not only meet these needs, but extend to accommodate a "wellness" program that will benefit cardiac rehabilitation patients and concerned at-risk populations as well. Further, the issues of compliance and motivation deserve consideration. Such a "wellness" program is introduced in this chapter, and effects the findings and implications of this research.

**Present Cardiac Rehabilitation Program Format**

Present cardiac rehabilitation programs are primarily physically and educationally based. The typical modern cardiac rehabilitation program is divided into three distinct phases. Phase I begins during hospitalization due to an acute coronary event. At this time, the patient is carefully monitored by an electrocardiogram (ECG) machine and a nurse or an exercise physiologist. The patient is educated about CHD and given light exercise activities such as low-level walking, and light calisthenic exercises. Information about the patients' percent body fat, cholesterol levels and other risk factors is reviewed for Phase II. Phase II begins about four to six weeks after the patient is discharged from the hospital. Cardiovascular fitness, ECG and blood pressure response to increasing physical exertion is evaluated through an exercise stress test. Nurses and/or exercise physiologists supervise various 50- to 60-minute exercise sessions about three times a week. Phase III serves as a health maintenance outpatient exercise program. Exercise programs are continued, often in supervised group settings. Many hospitals complement Phase II and Phase III programs with offerings of various classes which range from how to recognize angina to understanding cardiac medications. Often
times, a dietitian is available for participants who require diet modification. Some hospitals offer lectures on issues such as risk modification, exercise, nutrition, label reading, heart disease education and sexuality. In addition, some hospitals offer support groups for the participant which are often open to family members and friends. Phase I is invariably covered by insurance; Phase II may or may not be covered, and Phase III is rarely if ever covered by most health insurance plans.

Educational components in current cardiac rehabilitation programs are not sufficiently meeting the needs of cardiac patients. An attempt to assist CHD patients through provision of angioplasty educational booklets failed to alter behavior for fat-controlled diet, exercise habits, and smoking habits (Fletcher, 1986). Many times, patients are so overwhelmed by the pain, confusion and anxiety of a coronary event that even when information is dispersed, not much of the information is retained (Pashkow, 1993).

The exercise component is currently the strongest dimension of the current cardiac rehabilitation program. There are several problems inherent in this component as well. A select group of patients are often facing the challenge of establishing an exercise regime for the first time in their life, and may be "forced" to participate in what is perceived as a negative experience. In fact, some patients cannot improve their exercise tolerance, and may even experience a negative training outcome (Van Dixhoorn, et al., 1989). Exercise typically requires close supervision from the health care provider at all Phases, which increases program cost. Further, and most problematic, several studies have shown that maintenance of an exercise plan by cardiac patients is often poor (Martin & Dubbert, 1982).
Specialized lectures can be very useful to the motivated and educated patient; yet, few patients are capable of using brief information and pamphlets to modify their lifestyles. The potency of these lectures vary from program to program, but a review of current cardiac rehabilitation formats produced discouraging results. The most common problem among current programs is the brevity of the lectures offered, and the lack of psychosocial topics presented.

Despite these shortcomings, the format of current cardiac rehabilitation programs is efficient in concept, to an extent, effective. But this format has greater potential to better assist cardiac patients.

Creating A Wellness Program

An enhanced cardiac rehabilitation program would include mandatory courses in Phase I and Phase II that would normally be covered by insurance, and designed to promote program maintenance. Phase II would begin immediately following Phase I, and proactively involve patients in taking responsibility for their own health. Phase III would focus less on continued exercise and diet supervision and more on self-efficacy and behavioral training targeting reduction of specific psychosocial risk factors. Because Phase III is typically not covered by insurance, it would work towards providing cost-effective group therapy and not-for-profit support groups for cardiac patients and their families. In effect, the enhanced cardiac rehabilitation program would become an overall wellness program.

The wellness program would address several problems. The first concerns compliance and motivation of cardiac rehabilitation participants. Even when additional psychosocial components exist in cardiac rehabilitation programs, drop-out rates continue to be high in number. Motivated patients
who do follow and complete rehabilitation programs still suffer a lack of long-term treatment effects. Lozano, Carced, Artigao, Huertas & O'Neill (1989) found that while patients improved significantly on anxiety and depression control following the completion of rehabilitation, later on, the psychological situation deteriorates. Other studies have also produced similar findings in relation to other risk factors. The integration of a patient's support network may be vital to the program's optimal success (Pearson, 1987). Compliance has been studied most extensively in cardiac rehabilitation in exercise programs. Signing contracts, receiving individualized feedback and praise during exercise and flexible goal-setting were effective in promoting adherence to exercise programs (Martin & Dubbert, 1982).

Economical and efficient strategies are necessary to maintain the positive results obtained with early rehabilitation (Lozano, et al, 1989). Therefore, a second concern, cost, becomes a great consideration. Cardiac rehabilitation participation in current programs has shown to predict lower rehospitalization costs (Ades, Huang, & Weaver, 1991). The integration of counseling and supervision to address the needs of cardiac patients who require guidance to alter their lifestyle in a serious and meaningful way is predicted to produce a significant financial burden to health care facilities (Pashkow, 1993). More research written specifically with respect to psychosocial CHD risk factors is tantamount to promoting advancement in cardiac rehabilitation programs. Further, a research focus on preventive medicine and its potential financial benefits must be made in order to start up more effective cardiac rehabilitation programs. The main problem in promoting the inclusion of psychosocial factors in cardiac rehabilitation programs, then, rests within the difficulty of providing solid, statistical data to
prove the anticipated effectiveness of modified programs, and the continuing problem of monitoring the actual effectiveness of the programs. The wellness program would accommodate studies using controlled measures of psychosocial factors and the relationship of these factors to heart disease on a regular basis, to continually monitor and improve the program components. The cost of a wellness program could be defrayed somewhat by opening certain components such as lifestyle behavior modification classes to the general public. In addition, physicians could refer at-risk patients for certain modicums of treatment. These features could possibly offer significant justification for a wellness program because current behavioral-based cardiac rehabilitation studies proven effective in reducing CHD risk factors and improving general psychological health still fail to produce decreased mortality rates (Blumenthal & Levenson, 1987).

The wellness program would differ from current cardiac rehabilitation programs on several levels. A wellness program would be tailored to the individual patient and utilize a stage-model to determine level of each patient's readiness for change. Readiness for change would be assessed by structured interviews and questionnaires which would target problem areas (Type A behavior, smoking behavior, poor dietary behavior, sedentary lifestyle and negative affect) and define patients' stages of readiness for each area that is targeted for change. The target areas would be measured via evaluation of cholesterol and blood pressure levels, standardized stress tests, relative weight and fat percentages, alveolar carbon monoxide tests (to detect smoking) or self- or primary caregiver-report of smoking behavior, self- and significant other -reports of degree of social activity (number of personal phone conversations, social appointments, membership in informal and
formal social groups), eating behavior self- or primary caregiver-support, and depression and/or Type A (and/or hostility) assessment (if indicated). Continual evaluation of the wellness program can use these outcome measures to gage its progress, and indicate any need for adjustment.

The patients' readiness for change could be assessed by self- and caregiver-report to questions or statements which focus on the perception of the seriousness of the target area(s), perceived ability to perform the necessary lifestyle changes implemented in treatment, the perception of effort and time dedication needed to execute the lifestyle changes (reasonable or unreasonable), and the degree of power the patient perceives to possess to successfully improve overall health as a result of effecting the lifestyle changes. These results would be analyzed, and the patient would be treated according to current readiness to change indications. For example, a "pre-contemplative" heavy smoker who shows a lack of confidence in power over existing damage to health and a resistance towards putting any effort into smoking cessation would be given literature regarding the benefits of quitting on future health as well as validation of his or her own personal ability to quit successfully. Discussions and follow-up interventions (letters, pamphlets, phone calls and/or appointments) would ensue until the patient is brought to the next level of care, "contemplation." This type of treatment has been shown to increase compliance and maintenance to programs on a long-term basis.

Further, the wellness program would approach the risk factors for CHD from a community perspective, offering those at risk or interested in improving overall health admission into multi-modal care. This modification to current cardiac rehabilitation programs could justify the
existence of such a program by bringing in more money for funding through the increased participation and/or medical recommendation. Also, due to its focus on general health enhancement programs and credibility towards improving overall health as opposed to a strict focus on CHD risk prevention and lack of evidence to decrease future CHD events, the community-based wellness program has a better chance for acceptance and endorsement by the health industry.

Another benefit of a wellness program is its potential to train and encourage participants to continue treatment through the formation of self-help groups. The groups could be led by experienced participants, and composed of those participants willing to continue monitoring lifestyle changes effected by the wellness program. Groups could by initially and then intermittently monitored by wellness program staff members to ensure the quality and effectiveness of the groups. Meeting rooms should be provided for free of charge at the wellness program location. Meetings may also be open to those contemplating participation in the wellness program, which will potentially "sell" the program to a wider base of participants. This framework emphasizes the commitment of the health care provider to the community, and allows a "free" extension of the program that will promote long-term maintenance of behavior modifications for participants who may not be able to afford continuation of care.

Lastly, the wellness program would promote social support, which may increase motivation and compliance to treatment modalities. Healthful outings (planned walks on a trail through a woodsly area, group participation in a "cooking light" class at a community facility or group tickets to a ball game) can increase patients' social activities, quality use of leisure time, and
enjoyment of the new lifestyle. Often times, the caregiver will be able to participate and reap these rewards as well. Also, friendships would be made that could encourage continued participation in the group and adherence to lifestyle modifications. An outline of a prototype of a wellness program follows.

Wellness program: Phase I

The first component of the wellness program for cardiac health would begin with the hospitalization for a cardiac event, just as in current cardiac rehabilitation programs, and would include the routine services plus enhancements. All assessments for psychosocial risk factors should be performed during Phase I to facilitate the prompt development of an individualized wellness plan and to benefit from insurance coverage. In addition to using percent body fat to screen for obesity, blood pressure to screen for hypertension, and cholesterol count to screen for hypercholesterolemia, hospitals should administer a comprehensive questionnaire or structured interview (SI) to screen for degree of physical and social activity, smoking behavior, eating behavior, depression, anxiety and Type A behavior, particularly hostility (as previously discussed). This questionnaire or SI should aim to be simple in format, and completed not only by the patient, but also by the primary caregiver, usually a significant other. The inclusion of the primary caregiver is important to discover any conflicting answers. The conflicting answers would be brought up in a therapeutic discussion that will work towards establishing a good working relationship between the patient and primary caregiver. The primary caregiver can function as a positive influence to the patients, and can enhance treatment by increasing motivation and compliance in the rehabilitation
program. The patient should also be encouraged to complete the same questionnaire or SI formatted for the primary caregiver to answer in terms of the caregiver's perceptions of the patient, and vice versa. These measures would also screen for caregivers that may be potentially harmful, and allow for any necessary adjustments that will compensate for a caregiver that may be a poor influence (i.e. a chain smoker with an eating disorder and dislike for exercise that is not willing to change lifestyle habits) and/or allow some time to search for a more suitable primary caregiver. Finally, the questionnaire or SI would include the answer to the question, "What health areas do you feel you need to address the most?" This enables the staff to compare and analyze each self-report to the perceived patient/caregiver report to better understand the relationship between the caregiver and patient, and assist in giving each appropriate referrals.

The services provided in Phase I should include crisis intervention and support groups for family members, friends and/or significant others of the cardiac patient. This is important because such a traumatic event can lesson the capabilities of the patient's main social support system during the time a patient needs to feel that comfort and stability. Depending on the condition of the cardiac patient, care should also be delivered on the basis of assessed need. The patient's need for intervention at this time should be administered when the patient personally requests such service or is in a stable medical condition. Information given to the patient by all staff members should be straightforward and adequately explained. Any patient concerns at this time should be addressed, and any decisions regarding the patient's health should be made in conjunction with the patient after a thorough and complete discussion of choices available to the patient. These
tactics will empower the patient and the patient's social support system and build a foundation for self-efficacy.

Wellness program: Phase II

Phase II would immediately follow Phase I. The exercise and dietary components are generally well-defined in current programs. Dieticians and physical therapists are already on staff. The main problem with the current status of these components today is the lack of compliance to these programs. The goal of a wellness program is to foster the maintenance of appropriate health behaviors in patients and the patients' support systems. Phase II is on an outpatient basis, but the therapies and informational lectures continue to operate inside the hospital. Cardiac patients should be given homework assignments of activities that involve participants in their primary social support system outside of the hospital environment. The assignments will give the patient feedback, motivate wellness behavior among caregivers, and foster a sense of competency and individual success. The more successful the patient performs on these tasks, the more likely the patient will repeat the new behaviors. Further, information should be presented in group sessions where cardiac patients and their caregivers will be comfortable asking questions, addressing concerns and provide assistance to newer group members. In conjunction with exercise, stress management techniques such as deep breathing and visualization should be implemented just as vigorously. Relaxation therapy is indicated for treatment on almost every psychosocial risk factor, and can be easily learned and performed.

Specialized workshops would be provided for general weight control, general smoking cessation, anger management, stress reduction, healthy eating and social activities for patients and their caregivers. Workbooks and
pamphlets with guidelines and activity plans would accompany each workshop. Patients requiring stronger programs in smoking cessation and weight loss would be referred to approved behaviorally-based clinics or programs. Patients and caregivers requiring additional counseling, such as patients with noted depression, would be referred.

Video tapes would be available for use on wide variety of categories as well. Rental fees would be charged for videotapes, but would be waived after the patient or caregiver demonstrates knowledge of the material, and evidences successfull performance of exercises and guidelines presented in the material.

Personalized progress reports charting the patients' psychosocial health scores blood pressure, cholestrol and weight would be tracked weekly to give the patient feedback. This information is usually obtained from stress tests, which at this point in a cardiac rehabilitation program are covered by insurance. The chart will give the patient a visual aid to motivate towards continually better health.

Ideally, Phase II workshops would be open to at-risk patients that are self- or physician-referred. This would bring in more money to the program and provide primary risk prevention services that will ultimately reduce hospitalization costs by reducing the number of patients that require cardiac surgery.

Wellness program: Phase III

Phase III would consist of continued participation in specialized groups, such as those formatted for smoking cessation, weight loss and stress management. The Phase III in a wellness program should evolve of its own momentum. Since Phase III is rarely covered by insurance, Phase II program
members should be encouraged to hold their own informal group meetings. A classroom of the hospital should be available free of charge to these patients, and a volunteer therapist could intermittently monitor the meetings. Other programs, such as Heartmates, are also available at some hospitals. These meetings are designed to focus on the caregivers' experiences. Such programs continue to benefit the patient by allowing the primary social support system an outlet to voice a variety of specialized concerns in a therapeutic group setting.
CHAPTER IV
SUMMARY

The study of psychosocial CHD risk factors clearly shows a need for the integration of psychosocial factors in cardiac rehabilitation programs. Behaviorally based programs such as the proposed wellness program show significant success in reducing CHD risk and improving the quality of life for cardiac patients (Blumenthal & Levenson, 1987). However, meeting this need faces several challenges.

Although recent efforts in psychosocial rehabilitation strategies have strongly implicated, the need for the integration of psychosocial components such as Type A behavior patterns, smoking behavior, sedentary lifestyle, eating behavior and negative affect in cardiac rehabilitation programs, further research is needed to justify the inclusion of such components. Research especially lacks focus in evidencing the effectiveness of behavioral modification because efforts to this end are difficult to measure. The poor motivation of patients and the resulting lack of compliance in psychosocial interventions is disappointing. Further developments in the application of cognitive-behavioral, motivational, self-efficacy and social-learning theories is necessary in order to successfully integrate vital psychosocial interventions in current cardiac rehabilitation programs. From the review of current literature, it can be surmised that addressing psychosocial factors by instituting psychosocial-based cardiac rehabilitation programs will reap rewards in the long run for cardiac patients and quite possibly for cardiac
rehabilitation providers as well.

The reality of modern health care requires any implemented rehabilitation program to produce a favorable cost/benefit ratio. The integration of psychosocial interventions in a wellness program has the advantage of drawing cardiac rehabilitation patients as well as persons at-risk for CHD. However, the emergence of such modifications requires justification for the need for improved interventions and a strong theoretical basis for designing appropriate, long-term and cost-effective psychosocial interventions. The medical and psychological fields have firmly established psychosocial factors that threaten cardiac and general health. It appears that thorough acceptance and integration of treatments for these risk factors in cardiac rehabilitation programs has been stifled by the inability to produce solid research outcomes that satisfy the cost/benefit balance of hospitals.

The proposed wellness program addresses these concerns. It is community-based, utilizes a individualized, preventative approach to health care, and promotes the formation of social support networks. The program places a strong emphasis on adherence to treatment modalities to increase success of long-term compliance to lifestyle changes. The program can accommodate research through the evaluation of assessments of physical and mental health risk factors. The wellness program, then, is consistent with the premise that the focus of research at this stage in the game should work towards improving motivation and compliance in lifestyle change programs. Higher adherence to structured program studies would produce more accurate and significant results on the effects of multi-modal behavioral strategies. Due to the continued lack of convincing evidence in support of effective treatments for reduction of CHD risk factors, increasing compliance
in current cardiac rehabilitation programs seems to be the only effective means in which to move forward with further CHD risk factor research. The implementation of wellness programs may better serve the needs of the CHD patient population as well as the health needs of the community as a whole.
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VITA

The author, Dawn Elizabeth Newberg, was born on January 8, 1967 in Elk Grove Illinois. She obtained a Bachelor of Arts in Psychology from the University of Michigan in August, 1989. During her time at the University of Michigan, she co-directed a section of an undergraduate Psychology course and participated on a research team surveying young cancer survivors.

Dawn is a Loyola University of Chicago candidate for a Masters degree in Community Psychology. Dawn completed an internship at Lifeline, an inpatient drug rehabilitation center at Louis Weiss Memorial Hospital, and continues to research Nicotine Cessation with Dr. Sheldon Greenberg, a psychiatrist at Lifeline.
THESIS APPROVAL SHEET

The thesis submitted by Dawn Elizabeth Newberg has been read and approved by the following committee:

Elizabeth Vera, Ph.D., Director
Professor, Counseling Psychology
Loyola University Chicago

Steven Brown, Ph.D.
Professor, Counseling Psychology
Loyola University Chicago

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the thesis is now given final approval by the committee with reference to content and form.

The thesis is, therefore, accepted in partial fulfillment of the requirements for the degree of Master of Arts, Community Counseling.

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Date

Director's Signature