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A Need Assessment for a Four-Phase Cardiac Rehabilitation Program in Bowling Green, Kentucky

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for a Four-Phase Cardiac Rehabilitation Program
in Bowling Green, Kentucky

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A Needs Assessment

for a Four-Phase Cardiac Rehabilitation Program

in Bowling Green, Kentucky

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A Needs Assessment for a Four-Phase
Cardiac Rehabilitation Program in Bowling Green, Kentucky

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The purpose of this study was to assess the need for a four-phase cardiac rehabilitation program in Bowling Green, Kentucky, that would serve the South Central part of Kentucky, most specifically, the Barren River Area Development District (BRADD). This assessment was based on three questionnaires mailed to cardiac patients, area cardiologists and area hospital administrators.

Each population (patients, cardiologists and administrators) received separate questionnaires. The patient questionnaires consisted of three separate mailings: initial mailing, first follow-up, second follow-up. An interval of ten days separated each mailing. Follow-up phone calls to the cardiologists and the hospital administrators were employed for assurance of the questionnaires being completed and returned. Each mailing increased the response rate resulting in a 63.3 percent response rate. The three concerns investigated were

1. Were cardiac patients satisfied with the patient education rehabilitation services they received while both an inpatient and outpatient?
2. Did area cardiologists believe that a four-phase cardiac rehabilitation program was warranted in Bowling Green?
3. Did area hospital administrators believe that a four-phase cardiac rehabilitation program was warranted in Bowling Green, Kentucky?

An additional concern was whether or not the cardiac patients would have been interested in participating in an inpatient and/or outpatient program, had one been available.

The results of the assessment indicated that a four-phase cardiac rehabilitation program was needed and that it would be supported by cardiac patients, cardiologists and hospital administrators.

ACKNOWLEDGMENTS

Appreciation is expressed to the participants of this study without whose cooperation this thesis would not have been possible.

Gratitude is also expressed to Western Kentucky University and the Department of Health and Safety, who respectively provided funds, facilities and supplies for this study.

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Need For the Study

Introduction

According to the American College of Sports Medicine, cardiac rehabilitation has come dramatically to the forefront in recent years (1). Emphasis on rehabilitating cardiac patients is a major issue in the fight against heart disease, the leading cause of death in America.

Though cardiovascular health awareness has increased in recent years, an estimated 1.5 million Americans suffer heart attacks annually (2:18). During 1980, nearly two million deaths were recorded in the United States, of which 30 percent were attributed to cardiovascular disease,and 60 percent of those cardiovascular deaths were a result of coronary heart disease (3:viii). Translated into actual figures, coronary heart disease is the cause of death of an estimated 550,000 Americans per year (2:18; 4:1).

In the state of Kentucky in 1982 there were 32,797 deaths, of which 12,562 (38.30 percent) were attributed to heart disease. In reviewing Table One, it can be seen that in Kentucky, as age increases, so does the number of deaths due to heart disease. The most dramatic increase in heart disease death begins between ages 35 and 44 and continues to escalate through age 65 (5:103).

The pronoun He is used in the generic sense.

Table I

Leading Causes of Resident Deaths By Age Group
Number and Rates*: Kentucky, 1982

Cause of Death	All Ages		Under 6 Years		6-14 Years		15-34 Years		35-44 Years		45-64 Years		65 Years and Over	
All Causes	32,797	8.9	832	2.5	147	0.3	1,480	1.1	992	2.4	6,962	10.1	22,384	53.3
Heart Disease	12,562	339.0	14	4.1	6	1.1	77	5.9	222	53.5	2,442	353.7	9,801	2335.4

*Rate: All causes per 1,000 1981 Total Population in specified age group
Leading causes per 100,000 1981 Total population in specified age group
Note: Homicide includes legal intervention

Resident Deaths By Age Group, By District and County
Number and Rate*: Kentucky, 1982

District and County	All Ages	Under 1 Year	1-4 Years	5-9 Years	10-14 Years	15-24 Years	25-34 Years	35-44 Years	45-54 Years	55-64 Years	65-74 Years	75+ Years
Kentucky	32,797	675	142	77	85	756	724	992	2,169	4,793	7,764	14,620
	8.9	1172.3	62.6	27.3	27.8	107.8	119.4	238.9	611.2	1428.5	3049.7	8856.3
Warren	574	14	5	2	1	21	10	17	36	96	139	233
	7.9	1401.4	117.2	40.0	19.7	114.0	82.6	216.3	574.7	1681.0	3113.1	8265.3

*Rate: All ages per 1,000 1981 Total Population
Age specific per 100,000 1981 Total Population in specified age group

Annual Vital Statistics Report 1982 Department for Health and Human Services, Commonwealth of Kentucky

Kentucky statistics parallel national statistics showing heart disease as a leading cause of death (3:iii). Though on the rise since before 1940 (Table 2), and still the leading cause of death in America, not all heart attack victims die. An estimated 500,000 heart attack victims survive their myocardial infarctions and face the challenge of rebuilding their lives (6:93).

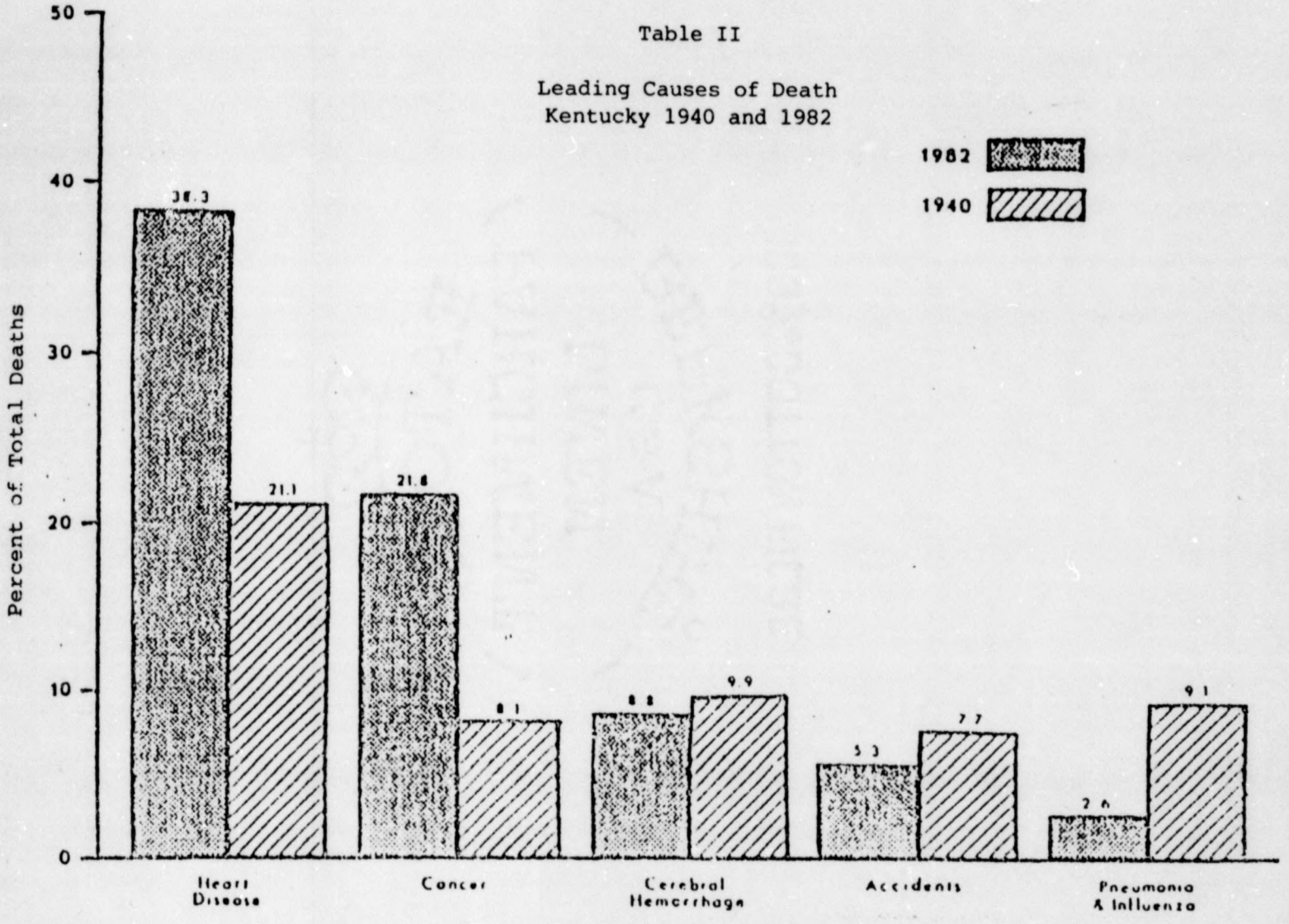
In this rebuilding process, cardiac survivors need effective, reliable cardiac rehabilitation programs. An effective cardiac rehabilitation program views rehabilitation as "the process concerned with restoration and maintenance of each cardiac patients' physical, psychological, social, educational, and vocational potential" (6:93).

This multifaceted approach requires expert coordination among different members of the health care team. Included are nutritionists, physical therapists, cardiac nurses, cardiologists, exercise physiologists, and patient education coordinators who generally oversee the entire rehabilitation program (6:93; 7:11).

Cardiac rehabilitation should not be envisioned as restricted to a hospital environment, any finite period of time, nor to any certain sized population or metropolitan area. However, due to the cost of a rehabilitation program, many smaller communities do not believe they can implement a four-phase cardiac rehabilitation program. Moreover, many smaller communities may not have a sufficient quantity of cardiac patients to warrant a program and therefore may not

Table II

Leading Causes of Death
Kentucky 1940 and 1982



Annual Vital Statistics Report
1982 Department for Health and Human Services
Commonwealth of Kentucky

be able to justify the need for a formal program apart from their patient education program.

Cardiac patients living in rural communities and small cities, though they may have the need of an effective cardiac program, find resources scarce and are forced to travel extensive distances to surrounding hospitals offering the appropriate rehabilitation services. In light of this apparent disparity, how does a community determine a need for a cardiac rehabilitation program?

One method of determining a need for a cardiac rehabilitation program is through a needs assessment. A needs assessment may indicate that smaller communities should

1) Combine efforts with other communities in the initiation and maintenance of a rehabilitation program.
2) Generate their own separate cardiac rehabilitation program, tailoring it to their specific needs.
3) Delay the program until such time that sufficient need materializes.

The primary purpose of this study is to objectively and validly assess the need for a four-phase cardiac rehabilitation program in Bowling Green, Kentucky, that would serve the Barren River Area Development District (BRADD).

The two hospitals in Bowling Green, Kentucky (HCA Greenview Hospital and the Medical Center at Bowling Green) have already inaugurated Phase One of a cardiac rehabilitation program. This phase includes patient education for myocardial infarction, information on physiology and anatomy of the heart, modification of risk factors, stress management, diet modification, and physical and occupational therapy.

According to Wirth, Patient Education Coordinator, Greenview Hospital, and Moore, Patient Education Coordinator, Bowling Green Medical Center, augmentation of existing cardiac education programs is a goal that is receiving current attention from both hospital administrations (8,9). Additionally, Ken Cooke, Division Director, South Central Division of the American Heart Association, Kentucky Affiliate; Dr. K. G. Sahetya, Bowling Green cardiologist and chairman of the Cardiac Rehabilitation Task Force; and the Bowling Green Parks and Recreation Department are all assisting in the effort to evaluate and possibly upgrade the existing cardiac segments of the patient education programs at the Bowling Green Medical Center and Greenview Hospital.

By identifying available resources and needs of the cardiac patients, a careful assessment will facilitate program expansion to be resource and cost-effective as well as advantageous to the cardiac patients in successfully renovating their lives.

Statement of Problem

Medical personnel in Bowling Green, Kentucky, have expressed interest in establishing a local cardiac rehabilitation program. This study is primarily designed to assess the need for a cardiac rehabilitation program in Bowling Green, Kentucky, which will serve South Central Kentucky.

This needs assessment will answer the following four research questions.

1) In regards to the cardiac rehabilitation services rendered to cardiac patients, were these patients satisfied with those services?

2) Would the cardiac patients have been interested in participating in expanded cardiac rehabilitation services had those expanded services been available?

3) Are the cardiologists, who are practicing in the BRADD district, of the opinion that a sufficient number of cardiac patients exist to warrant a four-phase cardiac rehabilitation program in Bowling Green, Kentucky, that would serve the BRADD district?

4) Are the hospital administrators, of the four hospitals operating in the BRADD district (HCA Greenview, Bowling Green Medical Center, T. J. Samson, Logan County Hospital), of the opinion that a sufficient number of cardiac patients exist to warrant a four-phase cardiac rehabilitation program in Bowling Green, Kentucky, that would serve the BRADD district?

This study will assess data from three sources:

1) A questionnaire survey of a random sample population of cardiac patients,

2) A questionnaire survey of the cardiologists in the four hospitals in the BRADD area and

3) A questionnaire survey of the hospital administrators at the four hospitals in the BRADD area.

Significance of the Study

Prior to having a heart attack, most cardiac patients feel in control of their lives. They are relatively healthy, self-confident and self-reliant compared to after the heart attack, in which they experience emotions of a less positive nature. Heart attack victims often feel depressed, uncertain of their future, incompetent, dependent upon others and sometimes hostile (6:95; 10:113-14). These needs, among others, must be effectively dealt with in order to successfully rehabilitate the cardiac patient.

In Bowling Green, Kentucky, Greenview Hospital and the

Medical Center currently have in operation Phase One of a rehabilitation (in-house patient education) program. Presently, these programs are extensions of the comprehensive patient education program that service all patients, not solely cardiac patients (8,9).

Nelson states that any program that does not address and provide vehicles for modification of other coronary artery disease risk factors is considered deficient (6:96). The total individual is to be considered in the implementation and operation of a rehabilitation program. This "total individual" concept consists of the physical, psychological, educational, vocational, social, and family needs of the cardiac patient (6:93; 10:113, 123).

Several groups exist in Bowling Green, Kentucky, that provide services to cardiac patients. These programs are not exclusive to cardiac patients, but are accessible also to the general public. Assessing their scope should aid in the design and possible augmentation of the existing single-phase cardiac rehabilitation programs (11; 12).

Two such programs are Body Recall and the Greenwood Mall Walkers Health Trail. Body Recall is an exercise program advocating body fitness through slow, fluid movements, analogous to that of yoga. This exercise program is primarily for senior adults who feel that they have lost muscle tone and flexibility. Body Recall is promoted by the First Baptist Church of Bowling Green, located at 621 East 12th Street. The Greenwood Mall Walker's Health Trail, originated by

Greenview Hospital for heart patients, has since grown to ameliorate walkers of all ages and physical conditions.

By properly utilizing these existing services, more efficient implementation should occur and effective aid for cardiac survivors in their lifelong maintenance could help to draw the community and medical profession closer together. This would provide an easier and more effective transition from phase to phase for all cardiac patients and their families.

Eventually, with cooperation between the hospitals and the community, cardiac rehabilitation principles may become cardiac prevention techniques that non-cardiac people will use to obviate their own heart attacks. By employing and incorporating healthy cardiac principles into their life-styles, and by utilizing available community programs (such as the Greenwood Mall Walkers and the Body Recall program), citizens may be able to enhance their lifestyle and ward off the possibility of coronary heart disease.

Limitations and Delimitations

This study will be limited and delimited to the following:

1) The geographic area of the Barren River Area Development District (BRADD)
2) The number of available cardiac patients from the Medical Center who have suffered a myocardial infarction within the calendar years 1983 and 1984
3) Cardiologists in the BRADD area working with cardiac patients
4) Hospital administrators in the BRADD area.

Definition of Terms

1) Cardiac Rehabilitation. Process of actively assisting the known cardiac patient, to achieve and maintain his optimal state of health. Cardiac rehabilitation is concerned with the process of restoration and maintenance of each cardiac patient's needs. These needs include the areas of physical, psychological, social, educational, vocational, and family needs.

2) Cardiovascular Disease. Degeneration and impairment of the heart and circulatory system due to various physiological factors. Cardiovascular diseases include coronary artery and coronary heart disease, atherosclerosis, arteriosclerosis, and myocardial infarction (heart attack).

3) Four-Phase Cardiac Rehabilitation Program. A structured program that cardiac patients participate in, that spans approximately one year of time. The phases are:

   Phase 1) Acute (Inpatient)
   Time Frame: Diagnosis to hospital discharge
   Phase 2) Convalescense (Outpatient)
   Time Frame: Discharge to 6-12 weeks post event
   Phase 3) Recovery (Outpatient)
   Time Frame: 6-12 weeks post event, to one year
   Phase 4) Maintenance (Non-patient)
   Time Frame: Open ended.

Chapter One

Notes

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2) R. Davis, "Closing in on the #1 Killer ... Heart Attack," Your Life and Health, 2/84, pp. 18-9.

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7) S. Palmer, Sonnenberg, L., "Enteral Nutrition-Part 9: Cardiac Rehabilitation: Role of the Dietition in a Multidisciplinary Team," American Journal of Intravenous Therapy and Clinical Nutrition, 11(3), 3/84, pp. 9-18.

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9) Sarah Moore RN, Patient Education Coordinator, The Medical Center at Bowling Green. Personal interview, 9/28/84, 10 A.M.

10) K. Dracup, et al., "Family Focused Cardiac Rehabilitation, A Role Supplementation Program for Cardiac Patients and Spouses," Nursing Clinics of North America, 19(1), 3/84, pp. 113-24.

11) Pamphlet, "Body Recall Exercise Program." Community Education, Bowling Green, Kentucky, 842-4281. First Baptist Curch, 621 East 12th Street, Bowling Green, Kentucky.

12) Pamphlet, "Greenwood Mall Walkers Club." Greenview Hospital, 1801 Ashley Circle, P.O. Box 370, Bowling Green, Kentucky, 42101.

CHAPTER TWO

Review of Literature

Castelli states that "every fifth man and every seventh woman develops coronary heart disease under the age of 60" (1:323). Many people, mostly between 35 and 65, suffer symptomatic signs of coronary heart disease, while more people under the age of 35 suffer asymptomatic signs of coronary heart disease (2:1). Studies have shown that an increased risk of coronary heart disease and heart attacks is due to such risk factors as elevated serum cholesterol (1,3-8), cigarette smoking (1,3,4-7), personality (4,5,7-10), and stress (4,5,8-10).

This prevalence is not restricted to the American continent. Studies abroad parallel American findings and suggest that risk factors and other common factors, existing in industrialized nations, increase the risk of coronary heart disease. Mortality is increased due to heart attacks and higher rates of cardiovascular diseases (11-17). A primary aim of many professional organizations and agencies worldwide is the reduction of coronary heart disease.

Many people develop standards of living (diet, daily habits, pastimes, lifestyles, etc.) that promote coronary heart disease (1:323-7; 11:551-9). Humanity continually seeks to find ways of making life more comfortable and less

physically and psychologically stressful. Smoking, high blood cholesterol, hypertension, and personality behavior are four of the main causes of coronary heart disease.

Cigarette smoking was first introduced into England by Sir Walter Raleigh in the late 1500's (18:167). Despite the research and warnings concerning the hazards of smoking, people continue to increase their risk of heart disease by smoking (1:325-6: 3:iv,vii; 19:79). The increase risk of heart disease resulting from the inhalation of smoke is not only due to cigarette, pipe and cigar smoke, it also results from industrial air pollutants such as fibrogenic dusts and hydrocarbons (20:48).

Diets high in animal fats, cholesterol and calories promote arteriosclerosis and atherosclosis (1:323-4).

Hypertension has commonly been called the "silent killer" and is the second leading risk factor of coronary heart disease.

Studies by researchers have isolated the personality type "A," verifying to limited extents, the relationship between aggressive striving for status, power, money, and success with coronary heart disease (1,4,5,7,8,10). The combination of smoking, high blood cholesterol, hypertension, and personality behavior synergize the risks of coronary heart disease. Individuals must learn to modify their lifestyles or face the possibility of a heart attack (1:323).

A heart attack is an event that is experienced by 1.5 million Americans annually, of which approximately 500,000

will die. The remaining 900,000 heart attack victims survive. What is to become of these cardiac survivors?

After occurence and admission to the hospital, cardiac patients must learn new adaptations to living in order to conduct a normal and productive life (21:93; 22:113). Most cardiac authorities encourage and promote rehabilitation programs to aid the cardiac survivor in regaining optimal levels of health. Cardiac rehabilitation is the process of actively assisting the cardiac patient in regaining a peerless level of health and fitness so that he will be able to lead a productive and fruitful life (21:93; 6:9).

Cardiac rehabilitation applies to more than just the physical realm of life. Dracup et al. state that the total cardiac patient needs restoration and revitalization in order to be fully recovered (22:113). Dracup professes that not only the cardiac patient, but the family as well, needs rehabilitation. One reason for family involvement is role transition.

Role transition is a significant change that must be accomplished by the cardiac patient. This encompasses a great deal of stress in which support for the cardiac patient is paramount (2:2-4; 22:115). This support should primarily originate from the family and significant members of the health care team (22:114-5). Role transition--from productive citizen (wellness role), to heart attack victim (sick role), to cardiac patient (at-risk role), to productive citizen (well-role)--requires a great deal of vicissitude in which

accurate direction, management and supervision by medical personnel is essential (2:2-3; 22:115,119).

Successful transition is a prime factor in cardiac rehabilitation. A heart attack victim must transit from an apparent healthy state in life (pre-arrest), through a catastrophic state (cardiac arrest), to a modified lifestyle (post event) that will be an alteration of his pre-arrest lifestyle. This alteration should include six areas: physical, psychological, vocational, educational, social, and family life (21:93).

In order to accomplish this, organized programs must be constructed and adhered to for the proper results to materialize. Several hospitals and medical facilities throughout the world, including the United States (6,21-28), Canada (29), Wales (14), Singapore (12), the Netherlands (29), and Chile, South America (30) have developed programs for cardiac rehabilitation. In the following discussion of cardiac rehabilitation programs, three programs will be reviewed in their entirety along with segments from other programs.

The three cardiac rehabilitation programs that will be examined are

1) Massachusetts General Hospital, Boston, Massachusetts (Table III) (21)
2) University of Ottawa Heart Institute, Ontario, Canada (Table IV) (13)
3) Singapore General Hospital, Singapore, Malaysia (Table V) (12)

These three programs incorporate four phases, although the fourth phase is only specified by Massachusetts General

TABLE III

OBJECTIVES AND COMPONENTS OF EACH PHASE OF CARDIAC REHABILITATION

PHASE I

Objectives	Components
1. To assist the patient and family in adaptation to the crisis of sudden illness 2. To educate the patient and family about the risk and nature of coronary artery disease 3. To assist the patient in identifying strategies for adhering to medical recommendations 4. To measure and evaluate the patient's response to graded exercise in order to establish guidelines for activities after discharge 5. To begin changes in behavior patterns to decrease cardiovascular risk 6. To reduce length of hospital stay 7. To prepare the patient and family for a smooth transition from hospital to home	1. Intake assessment 2. Establish individual goals for each patient 3. Develop treatment plan which should include: a. Graded exercise/ambulation schedule b. Beginning education (group and individual); suggested topics include: • Basic anatomy & physiology • Coronary artery disease (heart attack & angina) • Recognition of heart disease and its complications • Symptom awareness • Risk factor reduction • The role of exercise • Dietary considerations • Coping with cardiac disease • Physical activity including sex • Medications c. Discharge preparation • Low level graded exercise test • Activity prescription • Plan for Phase II follow-up

PHASE II

Objectives	Components
1. To further promote psychological, behavioral, and educational improvement. 2. To gradually increase the frequency, duration, and intensity of activity. 3. To minimize time to return to optimal activity and work level. 4. To assist the patient in developing a long term plan for rehabilitation and maintenance. 5. To assist the family in identifying their role in the patient's convalescence.	1. Low level home exercise program 2. Telephone follow-up 3. Follow-up visits (weekly — monthly) for: • monitored exercise sessions • education and counseling (group and individual) • family/patient support groups • smoking cessation groups 4. Intake tests/evaluation for Phase III

PHASE III

Objectives	Components
1. To prescribe and conduct a cardiovascular fitness program 2. To continue modification of risk factors and psychological rehabilitation	a. Supervised, aerobic exercise training sessions b. Supplemental home exercise prescription c. Education/Counseling • Group • Individual d. Behavior modification to include: • Smoking cessation • Stress management • Weight and lipid reduction • Adoption of lifelong exercise program e. Wean over six months to one year to advanced and independent exercise group

PHASE IV

Objectives	Components
To provide guidance and support for continuous lifestyle change	1. Independent group or individual aerobic exercise 2. Yearly medical follow-up (including exercise test) 3. "Club" activities such as newsletters, social and educational meetings, support groups

Table IV

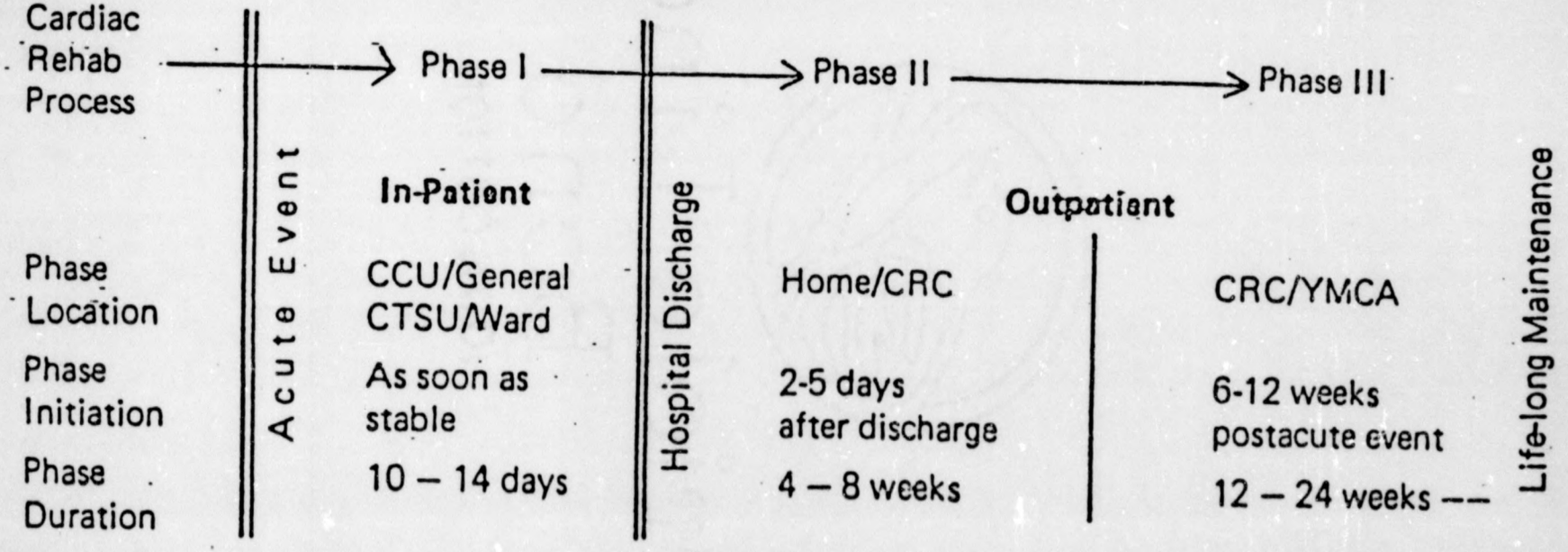
Ottawa Heart Institute

PHASE ONE	PHASE TWO	PHASE THREE	
Admission to Discharge	Discharge to Three Months	Three Months to Completion	
Patient Education Heart Attacks Phsysiology/Anatomy Risk Factors Risk Factor Management Life Style Modifications Support and Support Groups Patient Mobilization Post-Surgery Stabilization Extremity Movement Unassisted posture changes Patient ambulation	Patient/Low-Level Activities: Activities: Heart Rate 20 over resting heart rate Specialized exercise program is designed Factor Consideration: 1) Psychological aspcets 2) Risk factor profile 3) Activity profile 4) Vocational issues 5) Social problems 6) General rehabilitation inputs	Community Program Stress Test for Exercise Determination and Evaluation Exercise Prescription: Intensity Duration Frequency Lifestyle Modification Program: Coronary Heart Disease Seminars Stress Reduction Weight Control Smoking Reduction Stress Management Anxiety Depression	LIFE LONG MAINTENANCE

Table V

Singapore General Hospital

PHASES OF CARDIAC REHABILITATION



Hospital (21:93-4). Ottawa and Singapore imply phase four, but do not specifically incorporate it (13:12; 12:10).

Each program begins with inpatient education, titled Phase One (each program differing slightly). Singapore initiates structured, progressive ambulation activities along with patient education. Lasting ten to fourteen days and progressing through a seven to fourteen step program, Singapore commences Phase One activities as soon as possible following surgery. Phase One may occur in the Coronary Care Unit as soon as the patient is in stable condition (12:9-10).

Nelson, at Massachusetts General Hospital, begins Phase One at admission by completing an intake assessment on the patient, so as to work out an individual cardiac rehabilitation plan customized to the patient's specific needs (21:93-5).

Dafoe, at Ottawa, does not specifically state when Phase One begins but mentions that attempts to education and mobilze the cardiac patient during the hospital stay is a segment of Phase One. On day five or six at Ottawa, the cardiac patient visits the Ottawa cardiac rehabilitation center for exercising workouts (21:93-5).

In Phase One, according to Nelson at Massachusetts General Hospital, cognitive training should be emphasized ahead of the physical activity although both are incorporated in Phase One (21:93-4). Budan, in a controlled setting in El Paso, Texas, studied the effects of cardiac patient learning during Phase One in a hospital setting. Although she emphasizes that her results cannot be inferred to any population outside

the study group, she did find that her cardiac patients did achieve statistically significant cognitive increases ($P<0.001$) in cardiac patient knowledge (28:16-22). Though Budan's study cannot be inferred beyond her own population, it can be said that patient education during Phase One is beneficial and worthwhile (28:16; 31:7).

The cognitive objectives of Phase One centers around orientating the cardiac patient to his new environment, future expectations based on medical instructions concerning his present condition and circumstances and preparation for transition to subsequent phases of rehabilitation. Psychological and emotional support for anxieties that the cardiac patient may have are to be recognized in order to reassure the patient and facilitate maximal recovery in all areas (14:329-30,332). It is at this point that the cardiac patient's family should become more actively involved. The family needs to understand certain ideas, concepts, responsibilities and future implications because rehabilitation is not temporary, but permanent throughout the life of the cardiac patient.

Phase One is the most important phase as it lays the groundwork for all subsequent phases of the rehabilitation progress. One aspect that Ng Ah Chee mentions about the Singapore program is that of attitude. Ng Ah Chee states that a positive and optimistic attitude on the part of the cardiac health profssionals is indispensable (12:9). Fostering a positive attitude in the cardiac patient about

his future is definitely affected by the patient's perception of how his medical team views the entire cardiac rehabilitation program. Dafoe's view coincides with Ng Ah Chee's, commenting that if a patient has his physician's encouragement he will be more enthusiastic about the rehabilitation program (13:11).

Enthusiasm is a necessary element in cardiac rehabilitation programs because the cardiac patient is literally fighting for his life. Stewart and Gordan comment that in the past, before cardiac rehabilitation was seriously considered, physicians would advise cardiac patients to "take it easy." Stewart and Gordon report that patients often "find it hard to accept the fact that regular exercise, matched to their functional capacity, is more therapeutic than prolonged rest" (32:14).

Regular exercise on a graduating scale is the main brunt of Phase Two. Nelson, in her objectives for Phase Two, states that a gradual increase in the frequency, duration and intensity of activity is a component of the low-level home exercise plan. Through regulated exercise the cardiac patient will improve his physical stamina, mental alertness, mental disposition and outlook on life. Exercise helps to repair and strengthen the heart and enables the cardiac patient to prepare to return to work (21:93-6).

Clancy et al. state, "In research focusing on patients with coronary artery bypass surgery, the variable most often equated with improved quality of life is the return to

gainful employment" (27:173). Cardiac rehabilitation means making the heart strong once again. In order to return to work, one must have a heart strong enough to do jobs required at worksites. Phase Two is the prelude to that concept.

Though initiated in the hospital (transition from Phase One), Phase Two is completed at home. Usually, cardiac rehabilitation phases are governed by flexible time spans. In Singapore, Phase One lasts ten to fourteen days. Phase One at Massachusetts General Hospital continues until the patient is discharged from the hospital. Phase One at Ottawa concludes just prior to discharge. Phase Two continues on where Phase One leaves off. Respective Phase Two time span for Singapore, Ottawa and Massachusetts General hospitals is four to eight weeks; up to three months; and six to twelve weeks (12,13,21).

While exercise is a prime factor in Phase Two, the cardiac patient also has other rehabilitation responsibilities. At Massachusetts General Hospital these include: attendance at counseling sessions (both group and individual), family/patient support groups, continued diet modification, smoking cessation, stress management practice, and other Phase One components that are being assimilated (21:94).

Singapore General Hospital has a cardiac rehabilitation center in which the patients have supervised exercise programs either once or twice weekly (12:10,13). Singapore General Hospital requires that each patient maintain a daily exercise diary of his own program, which records the patient's pulse

rate and blood pressure both before and after exercise.

Siulys states that Ottawa, in their Phase Two low-level exercise activities, cardiac patients are not to raise their exercise heart rate any higher than 20 beats above their resting heart rate. This stage is critical for the cardiac patient because it is here in the second phase that all the knowledge and information gained from Phase One is now being put to use, and the patient is making adjustments so he can continue the lifestyle modification after Phase Two.

Ottawa is concerned with six aspects during Phase Two. These aspects are

1) Psychological aspects (difficulties at work, stress, family problems)
2) Risk factor profile (status of smoking, serum cholesterol, high blood pressure, etc.)
3) Activity profile
4) Vocational issues
5) Social problems
6) General cardiac rehabilitation input.

The goal of Phase Two is to return the cardiac patient to his pre-arrest physical conditioning level. Even though Dr. Dafoe admits that he does not expect a cardiac patient to change his entire lifestyle while still in the hospital, Dafoe does expect to have designed for each patient an individual plan that the patient can work up to and maintain throughout his lifetime (13:11).

Phase Three progresses on from where Phase Two leaves off. Phase Two must be solidly built and very well organized. Dr. Sahetya, of Bowling Green, Kentucky, strongly states that before the third phase can be started, the Phase Two cardiac rehabilitation segment must be well-established, organized

and administered, otherwise Phase Three would be a complete failure (33).

Phase Three spans from six to twelve weeks at Singapore General Hospital, twelve weeks onward at Ottawa, and from six weeks to one year at Massachusetts General Hospital (12,13,21). Singapore General Hospital accelerates the patients program in the third phase and titles it the Maintenance Phase. In Phase Three Singapore prescribes and reinforces lifelong exercise habits for the patient and operates family education seminars and social meetings to help provide strong positive support, health attitudes and camaraderie among the patients (12:10,13).

Massachusetts General Hospital titles Phase Three the Recovery Phase, which broadens the scope of Phase Two activities. In this phase the cardiac health care team attempts to "wean" the patient from hospital supervision and place him on his own recognizance. This weaning process usually takes from between six months to one year (21:94).

Dr. Dafoe and his staff term Phase Three as the Community Program. Similar to Singapore General, Ottawa accelerates the patients recovery and strives to infuse the lifelong attributes and attitudes essential to complete recovery. Ottawa, like Singapore and Massachusetts General Hospital, prescribes an exercise program for the patient during this phase, with close attention to abnormal heart rhythms and any possible angina (13:12).

Dafoe mentions a possible Lifestyle Modification Program

entailing

> "a variety of formal and informal educational sessions on different aspects of coronary heart disease and the rehabilitation program. Possible components of this program include an in-house stress reduction program, a weight control program and a smoking reduction program."

Psychologists and social workers would provide counseling on stress management, depression and anxiety (13:12).

Though only titled specifically at Massachusetts General Hospital, Singapore and Ottawa employ a version of Phase Four. Phase Four at Massachusetts General Hospital is termed the Maintenance Phase and Singapore terms the period of time after Phase Three as Life-long Maintenance, but has no program designed for the cardiac patients. This time is an extension of Phase Three throughout the remainder of the patient's lifetime. Ottawa does not mention an official period of time past Phase Three.

Massachusetts General Hospital refers to Phase Four only briefly. Nelson at Massachusetts General Hospital states that the Occupational Health Nurse is in an ideal position to assume the role of an ongoing facilitator for cardiac patients who have progressed to Phase Four, the Maintenance Phase (21:96; 34:97,99).

Summary

Coronary heart disease is one of the leading causes of death among industrialized nations. The citizens who suffer cardiac arrest are part of the workforce as well as the citizenry of these industrialized nations. In order to

remain healthy and productive, clear, precise, and exact measures must be undertaken to assure maximal survival of the cardiac population.

Upon reviewing the literature of various countries (United States, Canada, and Malaysia) it becomes evident that coronary heart disease and heart attacks are experienced worldwide. Further, the cardiac rehabilitation programs designed for the cardiac patients are similar in scope, context and time span. Variations exist in each program but only to limited degrees. The core of the three cardiac rehabilitation programs is essentially identical with modifications made to accommodate the individual as perceived by the attending medical staff.

Most cardiac rehabilitation programs consist of four phases:

Phase 1) In-house patient education and post-event ambulation
Phase 2) Accelerated cardiac rehabilitation attending to a broadened scope of physical, psychological, social, family, vocational, and educational needs
Phase 3) Community-based phase designed to strengthen the cardiac patient for resumption of independent life
Phase 4) Life-long maintenance phase where patient reemerges into the mainstream of life with lifestyle modifications designed to reduce coronary heart disease development and heart attack occurence.

Multifaceted in approach and lifelong in aim, cardiac rehabilitation is a valuable and useful tool in combating coronary heart disease and restoring cardiac patients to healthy, productive and fruitful lives.

Chapter Two

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CHAPTER THREE

Methods and Procedures

Introduction

The purpose of this study is to determine the need for a four-phase cardiac rehabilitation program in Bowling Green, Kentucky, that will service cardiac patients in the Barren River Area Development District.

This needs assessment utilizes a mailed, self-administered questionnaire format. According to Babbie, survey research is one of the most frequently used modes of observation in the social sciences, and mail surveys are the typical form of self-administered questionnaires (1).

Included in this chapter are the research questions, problems of the study, selection of subjects, data collection, and recording and methods of data analysis.

Description and Design

This needs assessment will answer the following four research questions.

1) In regards to the cardiac rehabilitation services rendered to cardiac patients, were these patients satisfied with those services?
2) Would the cardiac patients have been interested in participating in expanded cardiac rehabilitation services had those expanded services been available?
3) Are the cardiologists, who are practicing in the BRADD district, of the opinion that a sufficient number of cardiac patients exist to warrant a four-phase cardiac rehabilitation program in Bowling Green, Kentucky, that would serve the BRADD district?

4) Are the hospital administrators, of the four hospitals operating in the BRADD district (HCA Greenview, Bowling Green Medical Center, T. J. Samson, Logan County Hospital), of the opinion that a sufficient number of cardiac patients exist to warrant a four-phase cardiac rehabilitation program in Bowling Green, Kentucky, that would serve the BRADD district?

The problems of this study are threefold:

1) To construct a valid survey instrument for use with cardiac patients who have undergone patient education due to myocardial infarction.
2) To construct a valid survey instrument for use with cardiologists working in the BRADD district.
3) To construct a valid survey instrument for use with Hospital Administrators working in the BRADD district that serves cardiologists and cardiac patients.

Reliability was not sought because this instrument did not lend itself to a reliability coefficient. Reliability was not desired as the survey instruments were essentially for information collection, and differing opinions on the survey were desired (2).

The aforementioned problems consist of the following sub-problems: determination of the context of the survey instruments, development of the questionnaire items and refinement of the survey instruments.

The procedures followed in the determination, development and refinement of the survey instruments are determination of survey content by the Cardiac Rehabilitation Task Force, development of survey items by the Cardiac Rehabilitation Task Force, review of survey items by a panel of experts, arrangement and organization of survey items on the questionnaire forms, and refinement of survey instruments

by the Cardiac Rehabilitation Task Force.

Selection of Subjects

Selection of cardiac patients for the study was done by random sample from the Medical Center. In cooperation with the Medical Center administration, random sampling of cardiac patients from the years 1983 and 1984 was done by computer. The cardiac patients names and addresses were compiled by the medical records department, who then forwarded the names to the hospital administration who in-turn delivered the patients names and addresses to the respective cardiologists. The cardiologists released the patients names and addresses to the researcher at the Department of Health and Safety, Western Kentucky University, where the mailing of the questionnaires was conducted. The cardiologists and hospital administrators were selected from four hospitals in the BRADD district. The hospitals were

1) HCA Greenview, Bowling Green, Kentucky
2) Medical Center, Bowling Green, Kentucky
3) Logan County Hospital, Russellville, Kentucky
4) T. J. Samson Hospital, Glasgow, Kentucky

Data Collection and Recording

The cardiac patient questionnaire was mailed to each subject's home with a self-addressed, stamped envelope. The physician and hospital administrator questionnaire was mailed to place of employment. The data obtained from the cardiac patient, physician and hospital administrator surveys were collected at the Health and Safety Department of Western

Kentucky University. A Likert scale was used in the patient questionnaire for ease and accuracy of tabulation for later data analysis. Three mailings, each ten days apart, were conducted on the patient survey. These mailings were done to help ensure a high return rate. Physician and hospital administrator surveys were followed up by telephone calls, thereby helping to obtain a 100 percent return rate on these surveys.

Data Analysis

The data from all three questionnaires were analyzed by frequency distribution. All questions were tabulated using frequency of response on each of the questionnaire items. Percentages were tabulated on all appropriate items for determining the proportion of positive to negative responses. Median scores were utilized to determine the level of satisfaction of the cardiac patients with regard to the rehabilitation services rendered.

Summary

The purpose of this study is to determine if there is sufficient cause for the establishment of a four-phase cardiac rehabilitation in Bowling Green, Kentucky. This determination will be based on three criteria:

1) Satisfaction of cardiac patients with cardiac rehabilitation services
2) Inquiries of practicing cardiologists in the BRADD district
3) Inquiries of four hospital administrators in the BRADD district.

Chapter Three

Notes

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CHAPTER FOUR

Analysis and Interpretations

In this chapter the concern is the presentation of results from the analysis of the collected data. Findings resulted from three questionnaires mailed out to the following three populations:

1) Cardiac patients who were treated at the Medical Center of Bowling Green, Kentucky
2) Cardiologists in the Barren River Area Development District (BRADD)
3) Hospital administrators of four hospitals in the Barren River Area Development District.

The purpose of this survey was to determine the need for a four-phase cardiac rehabilitation program in Bowling Green, Kentucky, as determined by cardiac patients, area cardiologists and hospital administrators.

As discussed in Chapter Three, frequency of response on all questionnaire items was used to determine the percentage of favorable to unfavorable responses to the survey questions.

The questionnaires were mailed with introductory letters explaining the purpose and intent of the study. Each letter was accompanied by a questionnaire and a self-addressed, stamped envelope (Appendices A-D).

The cardiac patient questionnaire was mailed and each return evelope was number coded. Patients who did not respond

to the initial mailing received a second mailing. A third mailing was conducted for patients who did not respond to the second mailing. Ten days elapsed between each mailing, and the return rate increased with each mailing. The final return rate for all three mailings was 63.3 percent.

The physician questionnaire was mailed to three cardiologists whose names were obtained from the BRADD office in Bowling Green, Kentucky. These cardiologists are the only cardiologists in the BRADD area as identified by the BRADD office.

Each cardiologist received a letter, questionnaire and self-addressed, stamped envelope (Appendix C). Follow-up phone calls to each of the cardiologists, ten days after initial mailing, were employed to ensure return of the questionnaires. All three cardiologists returned a completed questionnaire.

Four hospitals were selected to receive administration questionnaires because of their large number of patient beds, large number of cardiac patients and extensive cardiac equipment. These hospitals were also selected because cardiac patients were more likely to go to these hospitals as opposed to smaller hospitals in the BRADD area which do not have adequate cardiac facilities.

Each hospital received one questinnaire addressed to the chief administrator (Appendix D). Follow-up phone calls were used with each hospital to help ensure a 100 percent return rate. As a result of the follow-up calls all four hospitals returned completed questionnaires.

Results on all three questionnaires were tabulated by frequency of response and a resulting percentage was calculated for all items on the questionnaires.

The questions to be answered were the following:

1) In regards to the cardiac rehabilitation services rendered to cardiac patients, were those patients satisfied with those services?
2) Would the cardiac patients have been interested in participating in expanded cardiac rehabilitation services had those expanded services been available?
3) Are the cardiologists, who are practicing in the BRADD district, of the opinion that a sufficient number of cardiac patients exist to warrant a four-phase cardiac rehabilitation program in Bowling Green, Kentucky, that would serve the BRADD district?
4) Are the hospital administrators of the four hospitals operating in the BRADD district (HCA Greenview, The Medical Center at Bowling Green, T. J. Samson, and Logan County Hospital) of the opinion that a sufficient number of cardiac patients exist to warrant a four-phase cardiac rehabilitation program in Bowling Green, Kentucky, that would serve the BRADD district?

Patient Questionnaire

The patient questionnaire consisted of eight questions concerning cardiac services received from their hospital (Appendix E). Each question will be introduced with a table and discussed individually.

Table VI shows the percent of male and female respondents.

Table VI

Respondents' Sex

Respondent	Population		Males		Females	
N	*R	%	N	%	N	%
30	19	63.3	14	73.6	5	26.4

*Respondents

Thirty questionnaires were mailed to randomly selected patients, of which 19 responded for a return rate of 63.3 percent. Fourteen respondents were male (73.6 percent) and five respondents were female (26.4 percent). According to several studies, the heart attack rate among males is higher than for females. Table VI illustrates this point showing a three to one ratio between male and female respondents (1).

Exhibited in Table VII are the range and mean ages of the respondents.

Table VII

Respondents' Age

Respondent	*Youngest	*Oldest	*$\bar{X}$
Males	38	69	52.07
Females	51	83	66.20
Combined	38	83	55.78

Frequency distribution by age

h=5 | f (males)	f (females)	Percent (males)	Percent (females)
35-39 2	0	14.2	---
40-44 3	0	21.2	---
45-49 2	0	14.2	---
50-54 1	1	7.2	20
55-59 0	1	---	20
60-64 4	0	29	---
65-69 2	1	14.2	20
70-74 0	1	---	20
75-79 0	0	---	---
80-84 0	1	---	20

*In years

Patient ages ranged from a low of 38 years to a high of 83 years. The mean age of both male and female age categories combined was 55.78 years. Males recorded the youngest age of 38 years, and females recorded the highest age of 83 years. The mean male age was 52.07 years, and the mean female age was 66.20 years.

Table VII shows that the male population in the study had lower age ranges than their female counterparts. According to the American Heart Association, the average male age during heart attack is between 45 and 55 years of age. As seen by Table VII, the mean ages of both patient categories parallel national norms. Also, males generally suffer from heart attacks at an earlier age as opposed to females (2).

Educational levels of the respondents are shown in Table VIII.

Table VIII

Respondents' Educational Level

Years of School Completed	N	$\bar{X}$	%
0-4 years	4		21.06
5-9 years	6		31.57
10-14 years	6		31.57
15-19 years	3		15.80
Total	19	9.3	100

As can be seen in Table VIII, the range of education of the respondents varied from those who had no formal education to post-graduate education. The mean educational

level was 9.3 years, with the majority of respondents falling in the five to fourteen year bracket (63.14 percent).

Table IX illustrates the counties where the respondents were residing at time of survey.

Table IX

Respondents' County of Residence

County	N	% By Response	County Population	**Rate
Edmonson	1	5.2	10,212	1.02
Butler	1	5.2	10,953	1.09
*Grayson	1	5.2	---	---
Logan	1	5.2	24,551	2.45
*Jefferson	1	5.2	---	---
Allen	2	10.6	13,915	.88
Hart	2	10.6	15,708	.78
Simpson	5	26.4	14,526	.29
Warren	5	26.4	80,119	1.60
Total	19	100.0	873,050	4.59

*These counties are outside the BRADD district

**Rate is per 10,000 population

Column one of Table IX shows the nine counties from which patient questionnaires were received. Grayson and Jefferson counties, though represented, are outside the BRADD district. No explanation was offered by the respondents as to why they were treated in Bowling Green, as opposed to a hospital in their home counties.

As can be seen in Table IX, Warren and Simpson counties both had the most numerous responses with five respondents each. All other counties yielded only one or two respondents.

Table IX shows Warren and Simpson as the two counties with the highest percent of response. Warren is the county in which the City of Bowling Green and the Medical Center are located, which could explain the high response rate. Franklin, a major city in Simpson County, is less than 20 miles from the Medical Center at Bowling Green, which could explain its high response. All other counties yielded only a five to ten percent response.

Table X shows where the respondents were treated.

Table X

Respondents' Hospital of Treatment

Hospital	N	%
The Medical Center at Bowling Green, KY	16	84.3
St. Thomas Hospital, Nashville, TN	2	10.5
HCA Greenview, Bowling Green, KY	1	5.2
Total	19	100.0

As can be seen in Table X, the highest percent of the respondents were treated at the Medical Center at Bowling Green, Kentucky. All of the patients were sampled from the Medical Center's records because a heart attack is an emergency and the Medical Center is the only hospital in Bowling Green with an emergency room and staff. All emergency cases

are first treated at the Medical Center. Then if the patient so desires, the patient is later transferred to the hospital of preference.

Table XI references patient satisfaction in regard to each of the respondents respective hospital's efforts to help the respondent regain his optimum physical and emotional health, post event.

Table XI

Respondents' Satisfaction With Services

Category	Satisfied #	Satisfied %	Dissatisfied #	Dissatisfied %	Total %
Physical Health	18	94.8	1	5.2	100.0
Emotional Health	17	89.6	1	5.2	94.8

Ninety-four percent of the respondents were satisfied and five percent were dissatisfied with their hospital's efforts to help them regain their optimum physical health. Eighty-nine percent of the respondents were satisfied with their hospital's efforts in helping them regain their emotional health, while five percent were dissatisfied. One respondent did not answer the question on emotional health, which accounts for the missing 5.2 percent.

"... Question 7)

"If an inpatient or outpatient monitored exercise program had been offered to help you recover from your heart attack, would you have been interested in taking either program?"

Table XII answers question seven of whether or not cardiac patients would have participated in expanded cardiac rehabilitation services, had those services been available at the time the respondents were in the position to utilize them.

Table XII

Respondents' Interest to Inpatient/Outpatient Programs

	Inpatient		Outpatient	
	N	%	N	%
Yes	13	68.43	15	79.0
No	2	10.52	3	15.8
No Response	4	21.05	1	5.2
Total	19	100.00	19	100.0

The data in Table XII reveals that the majority of respondents indicated that they would attend both inpatient and outpatient cardiac rehabilitation programs. Sixty-eight percent and seventy-nine percent, respectively, indicated that they would participate in the inpatient and outpatient programs while ten and fifteen percent of the respondents indicated that they would not participate in either the inpatient or outpatient program, respectively.

Question eight focuses on patient satisfaction with the cardiac rehabilitative services rendered to the respondent from the respondent's hospital.

Table XIII data illustrates the respondents knowledge and usage of services rendered.

Table XIII

The Respondents' Knowledge and Usage of Services Rendered

	Knowledge		Usage	
	Yes	No	Yes	No
1. Patient Education:				
A) Heart Structure/ Function	10 (62.5)	6 (37.5)	17 (89.4)	2 (10.6)
B) Recognizing Heart Disease Symptoms	13 (72.2)	5 (27.7)	16 (84.2)	3 (15.8)
C) Risk Factor Reduction	16 (88.8)	2 (11.2)	17 (89.4)	2 (10.6)
D) Diet Considerations	15 (88.2)	2 (11.8)	18 (94.7)	1 (5.3)
E) Stress Management	13 (81.2)	3 (18.8)	17 (89.4)	2 (10.6)
F) Exercise Education	13 (81.2)	3 (18.8)	18 (94.7)	1 (5.3)
G) Medication Education	12 (75.0)	4 (25.0)	18 (94.7)	1 (5.3)
H) Marital/Sexuality Counseling	9 (52.9)	8 (47.1)	17 (89.4)	2 (10.6)
2. Exercise Test	12 (70.6)	5 (29.4)	18 (94.7)	1 (5.3)
3. Home Exercise Plan	15 (83.3)	3 (16.4)	18 (94.7)	1 (5.3)
4. Follow-up Visits (Monthly, etc.)	15 (83.3)	3 (16.4)	17 (84.4)	2 (10.6)
5. Family/Patient Support Groups	5 (29.4)	12 (70.6)	14 (73.7)	5 (26.3)
6. Long-Term Exercise Program	11 (68.8)	5 (31.2)	17 (84.4)	2 (10.6)

Table XIII indicates that a majority of the respondents knew of the existence of the services. The two services that the respondents were most aware of were risk factor reduction (88.8%) and diet modification (88.2%).

Of all the inpatient programs, marital and sexuality counseling was the service that the respondents were the least aware. Only 53 percent knew about the service, and 47 percent were unaware that the service was offered.

Of the outpatient programs, home exercise and follow-up visits were the two services of which the respondents were most aware (83.3% each). The service that the respondents were least aware of was that of support groups. Only 29 percent of the respondents indicated they were aware that any type of support group service was available. Seventy percent of the respondents were unaware that any support group service was connected with their outpatient program.

The information on usage presented in Table XIII indicates that a majority of patients did use the services. The patient usage was high with all categories totalling in the 80 and 90 percent range.

Outpatient service usage was similarly high, with 80 and 90 percent usage, with the exception of support groups which totalled only 73.7 percent. This somewhat coincides with the low percent of 29 on knowledge of services for support groups. Though the usage percent, 73.7, is higher than the knowledge percent, 29.4, this difference could be attributed to any number of factors ranging from respondent misunderstanding of the questionnaire item to memory lapse.

Table XIV indicates the level of satisfaction of the services by the respondents.

Table XIV

Satisfaction of Specific Services Rendered

Possible Score		1(%)	2(%)	3(%)	4(%)	NR	Median
1. Patient Education:							
A) Heart Structure/ Function	#	11(85)	2(15)	0	0	6	1.09
B) Recognizing Heart Disease Symptoms	#	10(77)	3(23)	0	0	6	1.15
C) Risk Factor Reduction	#	10(77)	2(15)	1(8)	0	6	1.15
D) Diet Considerations	#	11(73)	4(27)	0	0	4	1.18
E) Stress Management	#	7(64)	4(36)	0	0	8	1.28
F) Exercise Education	#	10(67)	4(27)	0	1(7)	4	1.25
G) Medication Education	#	10(77)	3(23)	0	0	6	1.15
H) Marital/Sexuality Counseling	#	7(78)	1(11)	0	1(11)	10	1.14
2. Exercise Test	#	9(75)	3(25)	0	0	7	1.16
3. Home Exercise Plan	#	11(79)	2(14)	1(7)	0	5	1.13
4. Follow-up Visits (Monthly, etc.)	#	11(85)	2(15)	0	0	6	1.09
5. Family/Patient Support Groups	#	4(80)	1(20)	0	0	14	1.12
6. Long-Term Exercise Program	#	8(80)	2(20)	0	0	9	1.12
Overall Satisfaction Level							15.01 ÷ 13 = 1.15

Table XIV illustrates patient satisfaction with both inpatient and outpatient services. The median scores were tabulated in the following manner.

$$P_{50} = LRL + \left(\frac{\frac{Pr(N)}{100} - cfb}{fw} \right)$$

The respondents rated their satisfaction with each service on a scale from one to four, one signifying satisfaction and four signifying dissatisfaction. The number of responses were tallied in each column and were calculated in accordance with the above medium formula. P_{50} is the fiftieth percentile. LRL is the lower real limit of one (on the Likert scale), .5. Pr(N) is the percentile rank times the number of respondents for each question. The cfb is the cumulative frequency below which is zero. 100 is the number of times out of 100, and fw is the frequency within the interval. This procedure was followed for all inpatient and outpatient questionnaire items (3,4).

The highest level of satisfaction that could be recorded would be one and the lowest level of satisfaction would be four. Each score that fell in the one range indicated satisfaction on the part of the respondents. Each score that fell in the two, three or four range indicated a regressively lower level of satisfaction by the respondents for any particular questionnaire item.

The two services that the respondents found most satisfying were the inpatient heart structure and function service and the outpatient follow-up visits. The satisfaction score for both of these services was 1.09.

The two services that the respondents found least satisfying were the stress management (1.28) and the exercise education (1.25). All other services ranged from 1.09 to 1.18.

Calculating the overall satisfaction level, the respondents rated their satisfaction with services rendered at 1.15. This rating was calculated by averaging all the median satisfaction scores.

In reviewing the patient questionnaire results, several items should be noted.

1) The respondents represented a wide range of ages and educational backgrounds.
2) Seven of the ten BRADD counties were represented and two counties outside of the BRADD district were represented.
3) Three hospitals were represented, two of which are located in Bowling Green.
4) Overall patient satisfaction was recorded on all questionnaire items including: physical and emotional health, inpatient and outpatient services.
5) Patient interest in expanded cardiac rehabilitation services was indicated by the high percentage of positive responses for both inpatient and outpatient services.
6) Respondents indicated several areas of inpatient services that they lacked knowledge of and registered dissatisfaction with, of which are the following:

Inpatient Services

Service	% Lack of Knowledge
A) Heart Structure and Function	37.5
B) Recognizing Heart Disease Symptoms	27.7
C) Medication Education	25.0
D) Marital/Sexuality Counseling	47.1

Service	Median Dissatisfaction
A) Exercise Education	1.25
B) Stress Management	1.28

7) Respondents indicated several areas of outpatient services that they lacked knowledge of or used, of which are the following:

Outpatient Services

Service	%Lack of Knowledge
A) Exercise Test	29.4
B) Family/Patient Support Groups	70.6
C) Long-Term Exercise Program	31.2
Service	**%Lack of Use**
A) Family/Patient Support Groups	26.3

Physician Questionnaire

There are three cardiologists in the BRADD district. All three cardiologists were surveyed and asked their opinions on the necessity of a four-phase cardiac rehabilitation program. The questions asked pertained to six areas.

1) Physician's type of practice
2) The estimated annual number of patients with cardiac problems
3) Is a four-phase cardiac rehabilitation program warranted in Bowling Green, Kentucky?
4) Would you refer patients to a four-phase cardiac rehabilitation program if one were available in Bowling Green, Kentucky?
5) The number of patients you would refer to a cardiac rehabilitation program
6) Do you need additional training or assistance in utilizing cardiac rehabilitation principles?

Table XV shows the results of the physician questionnaire.

Table XV

Physician Questionnaire

Physician	Annual Number of Cardiac Patients	Annual Number of Referrals	Cardiac Rehabilitation Program Necessary?	Would Support A Cardiac Rehab. Program	Desire Additional Training	Desire Additional Assistance
A	1000	30	Yes	Yes	Yes	No
B	500	100	Yes	Yes	No	Yes
C	?	?	Yes	?	Yes	Yes

As indicated by Table XV the three BRADD area cardiologists estimated that approximately 1500 cardiac patients were examined annually. Cardiologist C did not give an exact figure but indicated "several hundred." Referrals totalled more than 130 as Cardiologist C indicated his annual number of referrals with a question mark. Cardiologists A and B indicated that they had large caseloads and would refer approximately 130 patients annually.

All three cardiologists indicated that a four-phase cardiac rehabilitation program was necessary, but only cardiologists A and B said that they would actively support the program.

Cardiologist C made three statements.

1) "Yes, Bowling Green does need a four-phase cardiac rehabilitation program, but Warren County physicians will have to make that decision."
2) "Cardiac patients will probably not travel outside their community to utilize a cardiac rehabilitation program."
3) "If any patients do live in or near Bowling Green, I will refer them, but I would not expect them to travel long distances to attend a program."

The question concerning additional training refers to training in principles of cardiac rehabilitation such as prescribed by the American College of Sports Medicine, or any other authority recognized by the medical community. Additional assistance refers to additional personnel necessary to run a cardiac rehabilitation program. Additional personnel could include nurses, physical therapists, exercise physiologists and dieticians.

Cardiologist A indicated that he desired additional training but no additional assistance. Cardiologist B indicated that he did not need any additional training but could use additional assistance. Cardiologist C indicated that he could use both additional training and additional assistance in utilizing cardiac rehabilitation principles to optimally benefit his patients.

It is interesting to note that Cardiologist A has 1000 patients with only 30 referrals, while Cardiologist B has only 500 patients but only 100 referrals. It would stand to reason that the more patients a cardiologist had the more referrals he would have for a cardiac rehabilitation program.

In addition, while Cardiologist C was the only cardiologist who stated that he currently had a cardiac rehabilitation program (in conjunction with physical therapy) and cardiologists A and B stated that they didn't have any cardiac rehabilitation program underway, only Cardiologist C requested both additional training and assistance.

Two possible explanations could be as follows:

1) Cardiologist C desires to upgrade his expertise and his program.

2) Cardiologists A and B have already undergone sufficient training in cardiac rehabilitation principles and have sufficient staff available.

The physician questionnaire reveals the following findings:

1) That at least 1500 cardiac patients are treated annually by the three cardiologists, and that at least 130 of the cardiac patients could be referred to a cardiac rehabilitation program.

2) All three cardiologists agree that a need for a four-phase cardiac rehabilitation program in Bowling Green does exist and that they would support the program.

3) Additional training and assistance is needed by all three cardiologists.

Four hospitals in the BRADD area were surveyed for their opinions concerning the need for a four-phase cardiac rehabilitation program. The questions asked of the four hospitals pertained to five areas.

1) The number of physicians consistently admitting cardiac patients

2) The annual number of cardiac patients treated medically or surgically

3) Are there a sufficient number of cardiac patients to warrant expansion of services to include a four-phase cardiac rehabilitation program?

4) What phases of cardiac rehabilitation are presently incorporated?

5) Would the hospital collaborate with other groups or agencies in the formation and utilization of a four-phase cardiac rehabilitation program?

Table XVI shows the results of the hospital administrator questionnaire.

Table XVI

Hospital Administrator Questionnaire

Hospital	# of Physicians	# of Cardiac Patients	Expansion Warranted?	Current C-R Phases	Willingness to Collaborate
A	30	800	Yes	1	Yes
B	12	325	Yes	1 & 2	Yes
C	2	?	Yes	1 & 2	?
D	35	150	Yes	1 & 2	Yes
Total	79	1275			

As shown by Table XVI, all four hospitals indicated that they had physicians who consistently admitted cardiac diagnosed patients. The number of admitting physicians ranged from two to thirty-five. The annual number of cardiac diagnosed patients totalled 1275 and ranged from 150 to 800 with hospital C answering with a question mark. No explanation was given on the survey as to why the question mark was used instead of any numerical value.

All four hospitals indicated that a sufficient number of cardiac patients existed in their hospital to warrant an expanision of services to include a four-phase cardiac rehabilitation program. Hospital C indicated on the survey that Phase One and Phase Two were currently used through the physical therapy department.

All four hospitals indicated that some form of cardiac rehabilitation program was already in effect. Hospital A

was the sole hospital having only Phase One incorporated while hospitals B, C and D all indicated that Phases One and Two were in current operation at their respective hospitals.

In regard to the final question on collaboration with other groups or agencies, hospitals A, B and D indicated that they would cooperate. Hospital C personnel placed a question mark and an explanation for this item stating that they saw only limited use of their program by the cardiac patients. Only patients residing in their community used the program.

Hospital C indicated that from past experiences most cardiac patients did not take advantage of the available program. Hospital C used a question mark instead of checking NO response and remarked that they would possibly be interested in cooperating in the formation and utilization of a four-phase cardiac rehabilitation program. However, they commented that they could give no firm commitment at the present time.

Two interrelationships between the physician and hospital questionnaires are the annual number of cardiac patients and the similarity in the answers of hospital C and cardiologist C. The cardiologists estimated the annual number of cardiac patients at 1500 and the administrators estimated the number at 1275.

In addition, cardiologist C and hospital administrator C are two different professionals from the same hospital. The similarity in their answers gives credence to each others

accuracy in assessing the need for a four-phase cardiac rehabilitation program from two different perspectives.

Findings

This needs assessment survey sought to answer the following four questions:

1) In regards to the cardiac rehabilitation services rendered to cardiac patients, were those patients satisfied with those services?
2) Would the cardiac patients have been interested in participating in expanded cardiac rehabilitation services had those expanded services been available?
3) Are the cardiologists, who are practicing in the BRADD district, of the opinion that a sufficient number of cardiac patients exist to warrant a four-phase cardiac rehabilitation program in Bowling Green, Kentucky, that would serve the BRADD district?
4) Are the hospital administrators, of the four hospitals operating in the BRADD district (HCA Greenview, The Medical Center at Bowling Green, T. J. Samson, and Logan County), of the opinion that a sufficient number of cardiac patients exist to warrant a four-phase cardiac rehabilitation program in Bowling Green, Kentucky, that would serve the BRADD district?

The findings of the survey are as follows:

1) The results of the patient survey indicated that cardiac patients were satisfied with the services they received as an inpatient and outpatient.
2) The three cardiologists who were surveyed stated that a need does exist in Bowling Green, Kentucky, for a four-phase cardiac rehabilitation program and that they would support such a program.
3) The four hospital administrators who were surveyed stated that a need does exist in Bowling Green, Kentucky, for a four-phase cardiac rehabilitation program.
4) The majority of the cardiac patients who were surveyed stated that if an inpatient program (68 percent) and an outpatient program (79 percent) had been available, they would have been interested in participating.

5) The cardiologists stated that they have a need for some additional training and assistance in the area of cardiac rehabilitation.

6) The hospitals stated that they would collaborate with other agencies in the formation and utilization of a four-phase cardiac rehabilitation.

Chapter Four

Notes

1) Health Consequences of Smoking: Cardiovascular Disease: A Report of the Surgeon General, 1983, pp. 7, 68, 101, 107, 127.

2) Heart Facts, 1985. American Heart Association, Dallas, Texas.

3) John A. Greene, Teacher-made Tests, Harper & Row, New York, 1963, p. 132.

4) J. Welkowity, et al., Introductory Statistics for the Behavior Sciences, 3rd ed., Academic Press, Inc., New York, 1982, pp. 40, 53.

CHAPTER FIVE

Summary, Conclusions, Recommendations and Implementations

The information presented in this chapter is an objective interpretation of the findings which were presented in Chapter Four. The findings are the result of responses to three questionnaires to three specific populations.

This chapter also includes a summation of the major points of the study, recommendations for improvement of the study and implementations for realization of a four-phase cardiac rehabilitation program in Bowling Green, Kentucky.

Summary

The major purpose of this study was to assess the need for a four-phase cardiac rehabilitation program in Bowling Green, Kentucky, that would serve the cardiac patients in the Barren River Area Development District.

Comprehensive lifestyle modification is the ultimate goal of cardiac rehabilitation. With heart disease still a leading cause of death and disability, cardiac rehabilitation is a tool used in restoring the lives of cardiac patients to optimum usefulness. Major hospitals and heart institutes divide cardiac rehabilitation programs into three or four phases. Four-phase rehabilitation programs are identical in basic format to three-phase programs except four-phase programs formalize and organize the lifelong exercise

phase for the cardiac patients. The fourth phase could be titled maintenance phase, community phase, long-term exercise phase, phase IV, or any number of similar titles.

Phase One occurs in the hospital and includes patient education, including information about heart disease, heart attack and heart restoration. Ambulation initiates during Phase One and continues in subsequent phases.

Preparation for Phase Two occurs in the hospital with ambulatory movements and low-grade exercises. After discharge, Phase Two progresses with low-level home exercises, follow-up visits with the physician and lasts approximately eight to twelve weeks.

Phase Three is also on an outpatient basis and is a progressive continuation of Phase Two lasting approximately one year. Phase Four continues throughout the patient's lifetime and is a continuation of all three previous phases.

Cardiac rehabilitation canvases six major areas: physiological, psychological, social, vocational, educational, and family life. The four-phase cardiac rehabilitation concept is designed to promote individual growth and help cardiac patients regain optimum levels of health in those six areas.

Several medical authorities in Bowling Green, Kentucky, stated the need for a four-phase cardiac rehabilitation program. The cost of initiating and maintaining such a cardiac rehabilitation program warranted a needs assessment.

Needs assessments may be done in several ways. This needs assessment was based on the opinions of professionals

in the field (cardiologists and hospital administrators) and cardiac patients.

Separate questionnaires were mailed to the three populations and the data were analyzed via frequency distribution, percent of response and median score by Likert scale.

Review of Findings

Several questions were formulated to assist the investigator in assessing the need for a four-phase cardiac rehabilitation program. These questions were as follows:

1) In regards to the cardiac rehabilitation services rendered to cardiac patients, were those patients satisfied with those services?
2) Would the cardiac patients have been interested in participating in expanded cardiac rehabilitation services had those expanded services been available?
3) Are the BRADD area cardiologists of the opinion that a sufficient number of cardiac patients exist to warrant a four-phase cardiac rehabilitation program in Bowling Green, Kentucky, that would serve the BRADD district?
4) Are the BRADD area hospitals of the opinion that a sufficient number of cardiac patients exist to warrant a four-phase cardiac rehabilitation program in Bowling Green, Kentucky, that would serve the BRADD district?

On the basis of information obtained from analysis of responses from the three questionnaires, the following findings were revealed:

1) A need and interest does exist in the BRADD district for the establishment of a four-phase cardiac rehabilitation program.
2) Cardiac patients are interested in participating in expanded cardiac rehabilitation programs.
3) BRADD area cardiologists agree that a need exists for a four-phase cardiac rehabilitation program and would support such a program.

4) BRADD area hospitals are interested in collaborating with other agencies in the establishment of a four-phase cardiac rehabilitation program.

Conclusions

Within the limitations imposed on this study and based on the procedures and findings of this investigation, the following conclusions concerning the need for a four-phase cardiac rehabilitation program were drawn:

1) With the need and interest verified by the data, it is recommended that a four-phase cardiac rehabilitation program be implemented in the city of Bowling Green, Kentucky, to serve the BRADD district.

2) Since all four hospitals verified their willingness to collaborate with other agencies in the formation, utilization and maintenance of a four-phase cardiac rehabilitation program, that collaboration among all agencies be examined for cost and resource efficiency in the establishment of the program.

Recommendations

For the improvement of this study the following recommendations are suggested:

1) That a cost effectiveness study be conducted to determine the optimum method of establishing the cardiac rehabilitation program.

2) That a study be conducted to determine what agencies (medical and non-medical) are interested (and to what degree) in the establishment of a four-phase cardiac rehabilitation program.

Implementations

For implementing the results of this study, it is suggested that

1) A single cardiac rehabilitation program (phases two, three and four) be established for utilization by all cardiac patients from all BRADD hospitals.

2) The Bowling Green Cardiac Rehabilitation Task Force be the governing body for the program with representatives from each agency involved with the program.

3) An inquiry of cardiologists and other health professionals be conducted to determine how and specifically what needs to be done to implement the mediums necessary (workshops, seminars, etc.) that would provide the additional training and assistance necessary to implement a four-phase cardiac rehabilitation program.

4) Considering the comments of hospital administrator C and cardiologist C, concerning patient participation, that caution and cooperation among agencies be exercised so as to maximize the efficiency and continued growth of a single cardiac rehabilitation program. Several programs, due to lack of patient participation and cost efficiency, could be monetarily unproductive, which would result in the discontinuation of cardiac rehabilitation programs.

Appendices

WESTERN KENTUCKY UNIVERSITY

BOWLING GREEN, KENTUCKY 42101

Department of Health and Safety

April 29, 1985

Dear Past Cardiac Patient:

Western Kentucky University, the American Heart Association, and Bowling Green Parks and Recreation Department, in a combined effort to examine the cardiac rehabilitation services for cardiac patients in the ten county BRAD area, are contacting you for your opinions concerning the rehabilitation therapy you received after your heart attack. The services we are concerned with are those you received while in the hospital, and after your discharge from the hospital.

These questions pertain to <u>your satisfaction</u> with the cardiac rehabilitation services you received from your doctor or hospital. Please answer the following questions as they relate to <u>your experience</u> as a <u>cardiac patient</u>.

Do not include your name. This is an anonymous and confidential questionnaire. When you are finished, please put the questionnaire in the self-addressed stamped envelope and mail it back as soon as possible.

Thank you very much for your assistance.

Sincerely,

John O. Fitts, M. D.
Cardiologist

JOF/KGS:ck

Sincerely,

K. G. Sahetya, M. D.
Cardiologist

Sincerely,

Steven M. Melia
Analyst

WESTERN KENTUCKY UNIVERSITY

BOWLING GREEN, KENTUCKY 42101

Department of Health and Safety

Follow-up letter to Past Cardiac Patients

Dear Cardiac Patient:

Recently you received an anonymous questionaire mailed to you by random selection from the medical records section of either Greenview Hospital or the Medical Center at Bowling Green. This questionaire dealt with your satisfaction concerning the service you received after your heart attack. If you have filled out and mailed that questionaire back, please disregard this letter.

If you have not completed and mailed the questionaire back to us, please complete this questionaire and mail it back today, using the self-addressed stamped envelope.

Since your name is known ONLY to the medical records personnel, we do not know who has or has not returned their questionaire. Your assistance in this matter is greatly appreciated as we are trying to improve the services rendered to you. Thank you for helping us in this study.

Sincerely,

Dr. K.G. Sahetya, M.D.
Cardiologist

Sincerely,

Dr. John O. Fitts, M.D.
Cardiologist

Sincerely,

Steven M. Melia
Analyst

WESTERN KENTUCKY UNIVERSITY

BOWLING GREEN, KENTUCKY 42101

Department of Health and Safety

Dear Dr.

I hope you will take about five minutes to complete the enclosed questionaire. Its purpose is to ascertain your professional opinion concerning the need for a formal cardiac rehabilitation program in Bowling Green, Kentucky.

This study is being conducted as a portion of my Master's Thesis with the Department of Health and Safety. Your responses will be held in strict confidence.

Thank you for using your valuable time to participate in the study. I will send you an abstract of my results.

Sincerely,

Steven M. Melia

Steven M. Melia
M.S. Public Health, Candidate

CARDIAC REHABILITATION PROGRAM PHASES

Phase I:	Acute (In-Patient)
Time Frame:	From the time diagnosis has occurred until discharge from the hospital.
Phase II:	Convalescence - (Out-Patient)
Time Frame:	From discharge to 6-12 weeks post event Monitored - Telemetry
Phase III:	Recovery - (Out-Patient)
Time Frame:	From 6-12 weeks post event to 1 year No Telemetry
Phase IV:	Maintenance
Time Frame:	Open ended

PHYSICIAN INTERVIEW QUESTIONAIRE

1) Type of Practice

____Cardiology

____Family Practice

____Internal Medicine

2) Please estimate the annual number of your patients with cardiac problems.

_____# of Patients

3) In your opinion, does Bowling Green, Kentucky need a formal cardiac rehabilitation program?

YES_____ NO_____

4) Would you refer patients to a formal cardiac rehabilitation program if one were available in Bowling Green?

YES_____ NO_____

5) Please estimate the number of patients per year you would refer to a cardiac rehabilitation program.

_____# of Patients (per year)

6) Do you, as a physician, feel that youcould use additional training and/or assistance in utilizing cardiac rehabilitation principles for the optimum benefit of your cardiac patients?

Additional Training

YES_____ NO_____

Additional Assistance

YES_____ NO_____

APPENDIX D

WESTERN KENTUCKY UNIVERSITY

BOWLING GREEN, KENTUCKY 42101

Department of Health and Safety

INTRODUCTORY LETTER TO HOSPITAL ADMINISTRATORS

The following questionaire was designed to elicit responses from hospital administrators in the Barren River Area Development District (BRADD), to ascertain their opinions concerning the need for a formal cardiac rehabilitation program in Bowling Green, Kentucky. This study is being conducted with the Department of Health and Safety. Your responses will be held in strict confidence. Please complete the enclosed questionaire and return it in the SASE as soon as possible. Thank you for using your valuable time to participate in this study.

Sincerely,

Steven M. Melia

CARDIAC REHABILITATION PROGRAM PHASES

Phase I:	Acute (In-Patient)
Time Frame:	From the time diagnosis has occurred until discharge from the hospital.
Phase II:	Convalescence - (Out-Patient)
Time Frame	From discharge to 6-12 weeks post event Monitored - Telemetry
Phase III:	Recovery - (Out-Patient)
Time Frame:	From 6-12 weeks post event to 1 year No Telemetry
Phase IV:	Maintenance
Time Frame:	Open ended

HOSPITAL ADMINISTRATION INTERVIEW QUESTIONAIRE

1) How many physicians using this hospital consistantly admit cardiac patients?

_____# of physicians (approximate if necessary)

2) How many patients with a primary diagnosis of angina pectoris or coronary heart disease are treated (medically and surgically), at this hospital per year?

_____# of patients (approximate if necessary)

3) In your opinion, are there enough cardiac patients at your hospital requiring rehabilitation to warrant an expansion of your services to include a cardiac rehabilitation program?

_____YES _____NO

4) What phases of cardiac rehabilitation do you now incorporate? Please check the appropriate phases.

_____Phase One

_____Phase Two

_____Phase Three

_____Phase Four

5) Would you (hospital), collaborate (with other groups or agencies), in the formation and utilization of a formal cardiac rehabilitation program?

_____YES _____NO

WESTERN KENTUCKY UNIVERSITY

BOWLING GREEN, KENTUCKY 42101

Department of Health and Safety

QUESTIONAIRE FOR CARDIAC PATIENTS

1) Sex: Male_____ Female_____

2) Age: _____

3) County of Residence: _____

4) Hospital where you were last treated for heart disease:

_____ Medical Center (Bowling Green)

_____ Greenview _____ Other

5) Highest Grade Completed: (Please Circle)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 +

6) How satisfied were you with the hospital's efforts to help you regain your best possible health, after your heart attack? Respond to the following catagories by circling the appropriate number.

Catagory	Very Satisfied			Very Dissatisfied
A) Physical Health	1	2	3	4
B) Emotional Health	1	2	3	4

7) If an inpatient or outpatient monitered exercise program had been offered to help you recover from your heart attack, would you have been interested in taking either program?

INPATIENT PROGRAM

_____YES _____NO

OUTPATIENT PROGRAM

_____YES _____NO

8) Regarding the following services, please circle whether or not:

A) You knew that the service was offered.
B) You used the service.
C) You were satisfied with the service.

	SERVICES	KNEW THAT THE SERVICE WAS OFFERED?		DID NOT USE	HOW SATISFIED WERE YOU? SATISFIED			DISSATISFIED
AS A HOSPITAL PATIENT	1. Patient Education:							
	A) Heart Structure/Function	YES	NO	0	1	2	3	4
	B) Recognizing Heart Disease Symptoms	YES	NO	0	1	2	3	4
	C) Risk Factor Reduction	YES	NO	0	1	2	3	4
	D) Diet Considerations	YES	NO	0	1	2	3	4
	E) Stress Management	YES	NO	0	1	2	3	4
	F) Exercise Education	YES	NO	0	1	2	3	4
	G) Medication Education	YES	NO	0	1	2	3	4
	H) Marital/Sexuality Counseling	YES	NO	0	1	2	3	4
AFTER LEAVING THE HOSPITAL	2. Exercise Test	YES	NO	0	1	2	3	4
	3. Home Exercise Plan	YES	NO	0	1	2	3	4
	4. Follow-up Visits (Monthly, etc.)	YES	NO	0	1	2	3	4
	5. Family/Patient Support Groups	YES	NO	0	1	2	3	4
	6. Long-Term Exercise Program	YES	NO	0	1	2	3	4

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