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FEASIBILITY OF HAVING AN EXERCISE PHYSIOLOGIST WORK IN A MEDICAL FAMILY CLINIC

by

KAREN ANN SMITH

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF SCIENCE

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.....

Supervisor

.....

.....

Date..... 23/4/85

DEDICATION

To my parents, Don and Mary Smith

and family, Don, Gail and Sandy

for their unending faith, support and encouragement.

ABSTRACT

A great number of patients are now asking their family practitioner for exercise advice and lifestyle modification services. Physicians do not receive preventative health training in medical school, cannot bill health care for such services and cannot spend an adequate amount of time with each patient to provide the necessary counselling.

The purpose of this study was to determine the feasibility of having an exercise physiologist provide advisory exercise and lifestyle modification services in a medical family clinic. Feasibility was assessed by investigating changes in physical activity and lifestyle habits after seeing the exercise physiologist, by analysing feedback from doctors, patients and the exercise physiologist, by logistically accomplishing the task and by conducting a cost-benefit analysis.

An exercise physiologist worked in two medical family clinics for a six month period. One hundred and fifty-four patients were involved in both pre and post testing. Each patients visit was comprised of a fitness test, counselling session and optional opportunity to have a Health Hazard Appraisal conducted. Those who saw the exercise physiologist made significant improvements in their eating and exercise habits and in their attitude and felt that they were fitter than they had been prior to seeing an exercise physiologist. All patients felt that the services provided were useful and beneficial and wanted to have the exercise physiologist continue to work at their clinic. Doctors were initially cautious but became supportive, referring their patients and taking advantage of the services themselves by the end of the study. Doctors also recommended that the project be continued on a regular basis. In theory, it appears to be cost-feasible for a family practice to employ an exercise physiologist.

Based on the results of this study, it appears to be both feasible and desireable to have an exercise physiologist work in a medical family clinic.

ACKNOWLEDGEMENT

I'd like to extend my thanks and appreciation to my advisor, Dr. Art Quinney who always found the time to see me, despite his hectic schedule. His support and guidance throughout my two years at U. of Alberta was valued.

Sincere thanks to Dr. Jeff Robinson and Dr. John Mackel who allowed me to work out of their clinics. Their support, encouragement and advice were essential and greatly appreciated. I also appreciate the assistance of the physicians and staff of the Misericordia Family Clinic and Coronation Medical Clinic.

Thanks to Dr. Bob Steadward for the time spent and advice offered as a member of my committee.

Finally a large thanks to my fellow graduate students. Their companionship made late nights and long weekends in the carrels more tolerable and my stay at U. of Alberta a great one.

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Chapter I

INTRODUCTION

The Fitness and healthy lifestyle fad that hit North America in the late 1960's and early 1970's has increased in fervor over the last fifteen years - discounting its label as a fad and placing it as a genuine change in attitude and practice. The quest for physical fitness and a healthy way of living has had a profound influence on many facets of life today; fashion, the media, food, entertainment, business and therefore the economy and socialization. It is not unreasonable therefore to see that this movement must also affect the medical field. Physicians are seeing more patients who are looking for sound advice on exercise or who want to or must modify their lifestyle habits. Physicians would be remiss in underestimating the strength of this health movement. It is not unreasonable to expect that practices that do not provide fitness or lifestyle services may lose a certain portion of their practice to sportmedicine clinics, commercial fitness establishments or other physicians that do.

Unfortunately, many factors seem to prevent general family practitioners providing these services even if they wanted to. One of the reasons is that

> medical schools generally do not teach the skills necessary for the practice of health promotion. Concepts of risk assessment, behavior change, exercise physiology and nutrition are visibly absent from medical school curricular. Even if physicians were taught many of these concepts, few clinical models for implementation now exist.
> (Dismuke and Miller, 1983)

Physicians are given even greater discouragement from health care programs which will not pay for any fitness, lifestyle or preventative medicine practiced. Many patients would likely object to a fee-for-service bill from their family doctor when they pay into a health care program. An adequate counselling session must last at least half an hour and a fitness test an additional twenty to thirty minutes. The majority of doctors do not have the time, the training or the means of billing for lifestyle services.

An obvious solution is to have the services provided at the medical clinic by an allied health professional.

STATEMENT OF PURPOSE

The purpose of this study was to determine the feasibility of having an exercise physiologist work in a medical family clinic. Feasibility was assessed by investigating changes in patients attitudes and practices in respect to physical fitness and lifestyle behaviors, by analysing feedback from the physicians, the patients and the exercise physiologist, by logistically accomplishing the task and by conducting a cost-benefit analysis (the latter in theory, all former in practice).

LIMITATIONS

The exercise physiologist could not control for the subjects lifestyle behaviors (diet, activity, smoking, consumption of alcohol) outside of times spent at the clinic nor for cultural or societal influences.

Since patients were seen over a six month period seasonal fluctuations in activity and lifestyle patterns could not be controlled.

DELIMITATIONS

This study was restricted to patients of the Misericordia Family Clinic and Coronation Medical Clinic, Edmonton, Alberta.

The report was based on the observations and experiences of one exercise physiologist.

DEFINITIONS

Exercise physiologist — A person who is knowledgeable in the structure and function of the human body and how it responds to exercise and who has expertise in fitness testing and counselling.

Medical family clinic — A medical facility which houses a number of General Family Practitioners and may also include other medical specialists and/or allied health professionals. The family practitioners share the patient workload and hospital duties. Patients come from the general population of the surrounding area.

Chapter II

REVIEW OF LITERATURE

RELATED LITERATURE

> It has been estimated that soon over half the deaths in the United States will be due to our living habits. For this we have only ourselves to blame. A healthy life-style is within reach of practically everyone, regardless of economic circumstance. In fact it would cost less than the way we are living now.
>
> (Sheehan, 1983)

The modern notion of preventative medicine probably has its roots in the industrial revolution. It was around this time that we started to realize that changes in our lifestyle habits could evoke changes to our health. In the third world countries today, many of the diseases largely eliminated by improved health practices in the more developed countries, are still a major concern.

> In developing countries, the inbalance of health resources allocations for hospitals, in contrast to public health programs, is particularly striking. Yet in these countries the enormous burden of preventable disease should favor the highest priorities for prevention and primary care. This policy is constantly promoted by the World Health Organization. And although it is all too seldom followed, the WHO emphasis... underscores the worldwide advocacy of prevention in preference to medical care.
>
> (Roemer, 1984)

In the industrialized nations there has been a definite shift in the epidemiology of diseases. In the past, leading causes of death included poliomyelitis, tuberculosis, influenza and pneumonia. Today these are largely eradicated and have been replaced by heart disease, cancer and stroke. The "modern" causes of death have all been related to smoking, diet, exercise and stress and have been termed lifestyle diseases (Bartlett, 1984).

In the 1960's the incidence of lifestyle diseases seemed to be reaching alarming

proportions. Agressive campaigns for improved lifestyle habits as a means of reducing heart disease and cancer were carried on at many levels throughout the 1970's.

> In the late 1970's and early 1980's, the strategies for prevention of chronic non-communicable disease began to show an effect. While the precise explanations were elusive, certain types of cancer - such as cervical cancer in women and stomach cancer in both sexes - had been definitely declining. When the mortality rate from heart disease in the United States was examined on an age-adjusted basis, it was found that after steady escalation it had begun to decline from 308 per 100,000 in 1950 to 208 in 1978. Death rates from lung cancer, associated with smoking, continued to rise, but there was much evidence that this lethal practice was lessening, especially in adult males.
>
> (Roemer, 1984)

There seems to be little in the literature describing how preventative health care is best provided or whose mandate it should be. At present, it seems that any group that is interested can and does practice preventative medicine and does so under a number of guises. Surveys have shown that family practitioners are providing little in the way of lifestyle counselling or more agressive preventative measures themselves (Catford, Wells, 1984) and yet seem reluctant to refer their patients to other health professionals who may specialize in this area.

There are a number of possible explanations for why preventative health care plays such a small role in regular family practice.

> Some physicians have opposed the introduction of prevention into medical encounters. The scenario goes something like this: Keeping people healthy is important, but it is not the business of physicians. Physicians should stick to treating illness because that is what they have always done and what they do best. Prevention is important, but the best prevention is public health, and this has nothing to do with practitioners of medicine.
>
> (Dismuke, 1983)

Sheehan (1981) suggests

> However little physicians know about exercise physiology, they know a great deal about disease. they treat it daily and study it constantly. They are suspicious of any therapies that arise outside of their orthodoxy. They demand solid scientific proof of claims for benefits from any new treatment - including exercise .... The effects of exercise on disease remain speculative and medicine is not a speculative

> profession. Physicians are doubters who know cures are hard to come by. These potential purveyors of fitness are a profession of skeptics and cynics. The optimistic promises of the jogging proponents turn them off.
>
> (Sheehan, 1981)

While this is undoubtedly true, Dismuke and Miller counter this argument somewhat.

> The reluctance of physicians to fully embrace the tenets of prevention is commendable. Many premises of prevention are not supported by incontrovertible evidence. This reluctance, however, is also paradoxical when compared with medicines proclivity to accept technological and therapeutic changes. Physicians seem extremely willing to try a new chemical or surgical therapy on the basis of preliminary evidence of its efficacy. Physicians are constantly making therapeutic recommendations on the basis of "evidence to date" with complete understanding that the evidence of tomorrow may change conclusions. The "evidence to date" strongly supports the favorable impact of preventative health behavior on a persons health and longevity. Is it therefore not appropriate to inform persons of this evidence and to indicate and direct how this can be achieved?
>
> (Dismuke and Miller, 1983)

A great deal of the reluctance of family practitioners to dispense advice probably arises from the fact that they receive very little or no formal training themselves while in medical school. Most schools deal only with disease emphasizing treatment over prevention. As a result, when physicians give information to patients it tends to be vague, incomplete and sometimes incorrect (Legwold, 1983, Clement, 1982, Gibson, 1983). Hage (1983) concluded that "the conservative advice that is given (to patients) won't do them any harm. But it won't do them much good either." A great number of professionals have decried the situation and urged medical schools to expand or alter the curricula to include various aspects of preventative health care (Ryan, 1981, Sheehan, 1975). This may be expecting too much out of the medical schools. Family practice covers such a broad array of health concerns that the present educational program is already criticized for spending too little time on each topic. Perhaps expecting courses on exercise physiology and exercise management, nutrition, stress, health counselling, etc. to be added to the curriculum is unrealistic.

If this is the case, then the obvious solution is to have this aspect of health care be

delivered by allied health professionals. This sector would include specialists (minimum of four year degree in the field of specialty) in exercise physiology, nutrition, stress management or health science. Unfortunately, too many doctors fail to recognize the training and capabilities of the allied health professions.

> The physician educated in isolation from these colleagues (professionals from the health science fields) is usually unaware of the contributions these people can make, and is unwilling to give them authority and autonomy in caring for patients. I see the family practitioner as the one man who can unite the medical profession and the others in the health sciences.
>
> (Sheehan, 1975)

Some inroads have been made in the delivery of preventative health care. Razor commented

> Twenty years ago, even ten years ago, the medical field would have raised hell about the current role of physical educators in encouraging healthful lifestyles. But as the years have passed, the medical field has recognized that one doesn't have to have a medical degree to do good work.
>
> (Razor, in Ryan, 1981)

Physicians are also reticent to provide fitness and lifestyle counselling because it is not financially rewarding to do so. Under the current Alberta Health Care Plan there is no category for preventative medicine, exercise prescription or lifestyle counselling (Alberta Health Care Plan, 1983). In British Columbia, the Minister of Health announced that physicians will not be paid for any type of preventative medicine or lifestyle counselling they administer (Mackel, 1985). Dismuke and Miller lamented the same condition in the United States (albeit under a vastly different medical system). Without the support of government or health insurance organizations it is not surprising that family practitioners are not providing preventative health care.

In somewhat of a paradox, the present economic situation may force them to do so in the near future.

Many patients are questioning the profit margins of physicians. In addition,

> corporations, insurance companies, and the federal government - who have been footing the bill for health care - are kicking aside old policies for new controls over what they see as rampantly rising costs. The results: a health care industry in upheaval and a growing competition among physicians for business.
>
> (Rogers, 1985)

Despite what the general public views as a 'healthy wage', due to stricter cost controls imposed upon them, doctors will likely have to work harder in the next decade to maintain their present wage. Add to this the fact that the patient:doctor ratio is declining and a need for expanded services arises.

> There are more physicians and more healthy people. This decline has far-reaching ramifications. Even a one per cent change in market share causes alarm to a soft drink company. I would say that the physicians' market share has experienced a five per cent decline in patients in the last ten to fifteen years.
>
> (Rogers, 1985)

It has been estimated that a surplus of physicians will exist within five years (by the year 1990).

> The health promotion and wellness industry is growing tremendously while traditional medicine is shrinking. If you look at all the people involved in the health field, the big losers in the next ten years are going to be the physicians. They stand to lose the most prestige and the biggest market share. As the publics' sense of awe about physicians decreases, people will be more willing to use other health care vendors such as hospitals, freestanding surgical and emergency clinics and sports medicine clinics that may not be staffed by physicians. Most of the activity in health promotion will be outside the medical profession.
>
> (Rogers, 1985)

At present, patients must go to a physician for a health check up, find an exercise physiologist for a fitness check up and for behaviour modification and then go to a nutritionist for dietary counselling. Likely the patient will have to go to three or more different buildings and pay three or more different fees. This is the least efficient method.

> Integrated prevention and medical care are bound to be less expensive then separate arrangements, if ony because of economics of scale and savings on transportation. But most important is the practical convenience for people, the administrative

> efficiency, and the greater community impact of providing preventative and treatment services at the same local facilities often at the same time. The customary separation of prevention and medical care in the free-market countries has been due to political, not managerial consideration.
>
> (Roemer, 1984)

> Other potent forces that are beginning to affect the role of health education on medicine are changing methods of third party reimbursement, growth of new systems of health care delivery (including health maintenance organizations), advances in health education research, continued rivalries among various medical specialties and health professions and evolving expectatons of health consumers.
>
> (Bartlett, 1984)

The last factor, the health consumer, is mounting increasing pressure upon family clinics to provide lifestyle services. In the United States, the "Harris poll found 25 million citizens running regularly and another 50 million doing some kind of systematic exercise to develop fitness" (Mann, 1984). In Canada, the Canada Fitness Survey found that fifty-six per cent of Canadians were active regularly. A great many more are attempting to start. These people are going to their medical clinics for specific advice and guidance. In most cases, in Canada, such services are not available and they are forced to go elsewhere. All top often, they end up receiving poor or inadequate advice from a commercial fitness establishment whose staff lack the necessary training and educational background.

No examples of an exercise physiologist working in a medical clinic could be found in Canada. Three such instances were found in the United States. (There are undoubtedly other cases which have simply not been cited in the literature). One example of such an arrangement is that of John Schlife, an exercise physiologist who has worked in a private family physician practice in Salina, Kansas (an agricultural community of 40,000) since 1978 (Schlife, 1982, Hage, 1981). His duties include fitness evaluations and exercise prescription, wellness programs for businesses, the fire and police departments, cardiac rehabilitation program, stress testing and lifestyle seminars. He has operated at a profit throughout his employment there. The

second example is that of Bruce LeFew who works out of Sacred Heart Hospital in Cumberland, Maryland. His duties include fitness assessments, cardiac rehabilitation (excluding stress tests), exercise therapy for the chronic pain management program and patient counselling. He is paid a set salary irrespective of revenue produced. A more complete description of his duties can be found in a letter in Appendix A. In the third example, the pediatric cardiology department of the University of Michigan made a half-time appointment in the school of medicine for Dr. Victor Katch, an established exercise physiologist in the physical education department at the University. There,

> Katch is involved in setting standards for testing equipment and choosing protocols for the program. He assesses the effectiveness of various types of exercise for nonsurgical cardiac patients and provides advice about the effects of body composition, anthropometrics, and cardiovasuclar fitness on a patient's status.
> (Moore, 1984)

The idea of integrating the fields of medicine and exercise physiology is not new. Those in the area of cardiology, orthopaedics and sportsmedicine have taken advantage of what exercise science has to offer their fields of specialty. Where it is an innovative idea (and probably one whose time has come) is in family practice.

PROTOCOL

Evaluating the effectiveness of the exercise physiologist in this study was based, in part, on the responses to the Canada Fitness Survey (CFS). The CFS was designed by the Canada Fitness Survey organization under contract to Fitness Canada. No papers have been written regarding the reliability or validity of the survey (Craig, 1985). The questions on the survey were drawn from a number of other related surveys (list not available) and designed by the Canada Fitness Survey staff. The survey was then tested in a pilot study, after which further modifications to the questionnaire were made (Glassford, 1985). An example of the final survey format can be found in Appendix B. The CFS was used for this research for three

reasons: the population was Canadian, including randomly selected households from both rural and urban areas of all provinces and territories; it had a large data base for comparative purposes - over 20,000 responses were tabulated; it provided the same information the researcher was seeking, specifically pertaining to the patients fitness and lifestyle habits and attitudes toward fitness and lifestyle factors. The Canada Fitness Survey has written a number of books on the information retrieved from the study (Canada Fitness Survey 1982, 1983, 1984).

The testing protocol used was the Canadian Standardized Test of Fitness (CSTF) for all fitness components except cardiovascular. For this component, a two stage, eight minute bicycle ergometer test was used in place of the step test. Although much has been written about the step test portion of the package (Bailey, Bonen, Jette, 1976), the literature is bereft of information on the CSTF as an entire package. The historical development of the Canadian Standardized Test of Fitness as described by Fitness and Amateur Sport, Government of Canada is as follows:

> The Standardized Test of Fitness evolved from recommendations of the National Conference on Fitness and Health held in Ottawa in December of 1972. In order to meet these recommendations, an "Advisory Committee" was formed by Recreation Canada. In December of 1976, the Committee agreed upon a number of distinct elements which, when organized into a battery, would form the theoretical base for the Standardized Test of Fitness. It was also agreed during this meeting that the most suitable milieu to evaluate the value of this protocol was the business and industrial setting.
>
> The Canadian Public Health Association (C.P.H.A), because of its numerous influential contacts in the occupational health sector, was chosen to develop and administer this project in the summer of 1977. This was made possible through joint contributions from Loto Canada and the Federal Department of Manpower and Immigration.
>
> The original fitness battery proposed by the Committee was finalized by the research advisor in conjuction with the regional directors of the 1977 C.P.H.A. project. Industries across Canada were asked to cooperate with the project.
>
> Based on the reports of this project, the Standardized Test of Fitness was modified and is now available to interested professionals and practitioners in the field of health and physical education.
>
> (Canada STF, 1982).

Another tool designed and made available to fitness professionals by the government is the Evalulife questionairre which was originally titled the Health Hazard Appraisal. This program was used in this study for counselling patients on health and lifestyle habits.

The prototype of the Health Hazard Appraisal was designed by Dr. J. Hall and Dr. L. Robbins of Methodist Hospital in Indiana. In 1972 the Department of National Health and Welfare adapted the original instrument for use in Canada (using Canadian statistics) and computerized the program for ease of delivery and so that the risk factor analysis could continually be updated. Today the program, based in Ottawa, is used in a number of family practices, universities, public and employee health units, and various health centers in Canada (Hawkins, 1983, Colburn, 1974).

Lauzon studied the effectiveness of the Evalulife in reducing high risk lifestyle behaviors. He administered the form to 346 randomly selected subjects in the Ottawa-Hull area. Subjects were divided into three groups: a) those who did not receive Evalulife; b) those who received the Evalulife printout but no counselling; c) those who received the Evalulife printout and counselling. The purpose was "to determine the ability of the HHA/EV in stimulating risk-reduction behavior" (Lauzon, 1984). He found that the Evalulife positively affected alcohol consumption, exercise, weight and diastolic blood pressure (in 30-40 year old patients only). It did not seem to cause significant changes in smoking, seatbelt usage or systolic blood pressure. In addition, women who had the Evalulife were more likely to have a breast self-exam. In all cases, the compliance demonstrated by those who had received the Evalulife was enhanced when counselling supplemented the printout.

All patients received fitness and lifestyle counselling, aside from or as an adjunct to, the Evalulife. The effectiveness of counselling has been bantered about in many psychological, social, medical and health science publications. In general, counselling does appear to be more effective than not and is widely used in a variety of fields. There appears to be some discrepency between articles found in the literature and subjective reports of the family

physicians involved in the study. The majority of articles on patient compliance report some degree of success. Mulder (1981), found that "of individuals prescribed individual home exercise programs (by their family doctor) 55.2% continued to achieve greater than 75% of their exercise goal after 32 weeks of participation" In a national survey of family doctors, Townsends (1980) found that "only 38 per cent report that their attempts at patient guidance are rarely or never effective". These reports seem to contrast what many medical practitioners are saying. In a round table discussion of family practitioners published in the Physician and Sportsmedicine, most of the doctors felt that "in family practice we are often frustrated by the difficulty of getting people to comply with our treatment regime, but especially in regards to exercise" (McKeag, 1983). This sentiment was often echoed by the medical practitioners the author was in contact with.

The reasons for the discrepency are only speculative. In general practice, lifestyle and exercise counselling is often limited to less than three minutes ("cut down on sugar and fats, start walking for fifteen minutes every day"). In the studies cited in the literature it is likely that the patients were subjected to more aggressive lifestyle counselling to achieve the modifications claimed. It is also possible that studies which had no effect on patients were either never submitted or not accepted for publication.

The rate of compliance will vary considerably from setting to setting. However, it would appear that doctors and allied health professionals in a medical clinic are under a near ideal situation for eliciting change should they accept the challenge.

> Most health professionals have witnessed the increased health concern evident in patients who have recently had a minor temporary illness. This sharpened focus is probably due to the realization that they are vulnerable and that the loss of health, even temporarily, can have a devastating effect. In fact, patient compliance with the health professionals advice is usually dependent upon this perception of vulnerability.
>
> (Hawkins, 1983)

> During times of crises, people are more amenable to changing unhealthy ways of life than at more stable times. Because of contact with people during times of crises, the physician is in a unique position to help patients take advantage of an illness to modify their long-term health behavior.
>
> (Dismuke and Miller, 1983)

Bruce et al found that an exercise test alone can provide enough of a motivational effect to cause patients to modify poor health habits. Using a multistage treadmill protocol, they found that

> 63% of patients replying indicated they modified one or more risk factors and health habits and this change they attributed to the exercise test. This pilot study raised the possibility that exercise testing may play an important role in modification of coronary risk factors and health habits.
>
> (Bruce et al., 1980)

Chapter III

METHODOLOGY

METHODS

Two medical family clinics were approached and agreed to participate in the study: the Misericordia Family Clinic and the Coronation Medical Clinic. The Misericordia Family Clinic is a University of Alberta family practice teaching unit and is an annex of the Misericordia Hospital located in west Edmonton. The Coronation Medical Clinic is a partnership of four family practice physicians located in north central Edmonton. Dr. John Mackel, the Medical Director of the Misericordia Family Clinic and Dr. Jeff Robinson of Coronation Medical Clinic consented to act as liason and to co-ordinate the program in respect to their clinics.

It was agreed that the exercise physiologist would work four days per week (eight hours per day) for a period of five months starting July 1. The services provided would be limited to fitness testing, exercise prescription and lifestyle counselling. Patients would see the exercise physiologist by choice, after reading a posted notice about the project, by referral from their physician or after being included in the random selection procedure used for filling out the Canada Fitness Survey.

Due to laws prohibiting physicians from advertising their services, only those patients who came in direct contact with the exercise physiologist (by being asked to fill out the questionnaire) or who happened to read the 8" x 11" notice (Appendix C) posted on the wall of the clinic were made aware that the program even existed. As the study progressed, word of mouth and physician referral also served to promote the program. As the receptionists at both clinics felt that they were already overworked and would not take on the additional task of handing out surveys, the exercise physiologist spent approximately 6 hours per week at each clinic handing out copies of the Canada Fitness Survey (CFS) to every fifth patient who entered the clinic.

Prior to seeing the exercise physiologist all participants were given a form (Appendix C) explaining the study and were asked to fill out a copy of the Canada Fitness Survey. Those who wished to complete an Evalulife (formerly known as Health Hazard Appraisal) questionnaire were also given the appropriate form at that time. Appointments for fitness testing and counselling were generally made for two to three weeks after initial contact with the exercise specialist (due to the number of bookings).

All testing and counselling occured in a room off the gym at the Misericordia Nurses Residence which is on the same grounds as the Misericordia Hospital and Family Clinic. There was neither enough equipment nor office space to set up separate facilities for each clinic. None of the participants from the Coronation Clinic complained of having to travel to the Misericordia for a test or counselling session. However, a number of patients from both clinics did report difficulty in finding the Nurses Residence within the complex of buildings at the Misericordia. In order to alleviate this problem all participants were given a map and, as much as possible, the tester tried to meet all participants in the lobby of the Residence to avoid confusion within the building.

The testing protocol used is as follows:

1. Anthropometric data
    1) height
    2) weight
    3) skinfolds (Durnin formula)
2. Cardiovascular
    1) two stage, 8 min. ergometer test
3. Flexibility
    1) Dillon sit and reach
4. Muscular strength
    1) grip dynamometer

5. Muscular endurance

   1) one minute sit-up

   2) continuous push-ups

This is in general compliance with the testing protocol established by Fitness Canada and encouraged for use in Canada by CASS (Canadian Associaton of Sports Science, 1982). A more detailed description of the test protocols and an equipment list can be found in appendices D and E. Immediately prior to the test all participants were required to sign a consent form (Appendix F) and complete a Par-Q (Appendix G). No one was screened out of the program.

Following the test, a counselling session was held with each patient to explain their test results and discuss potential changes in lifestyle behaviors. All participants were offered a wide variety of reading material to take home with them and invited to return should they require further consultation. In four cases, individual exercise prescriptions were designed. Individual exercise prescription was generally not encouraged since the efficacy is questionable.

Three months after filling out a survey, participants were contacted again by telephone to reanswer CFS questions #10, 11, 12, 18, 19, 20, 24 and 29 and to answer some additional questions regarding their opinion of the study and changes (if any) as a result. The additional questions can be found in Appendix H. The telephone interview process was adopted for the following reasons: It was expected that the return rate would be greater by phoning. The survey takes twenty-five minutes to fill out and it was assumed people would not take the time. Secondly, the researcher wanted some general feedback and the phone technique is more conducive to this. Thirdly is cost. It would cost $128.00 in stamps alone to send out 200 forms and a return envelope. While this process facilitated the data gathering, it proved to be very time consuming.

It was expected that those who had no contact with the exercise physiologist would show little or no difference in their responses while those that had interacted may show some improvement in either attitude or fitness and lifestyle habits.

DATA ANALYSIS

Due to the nature of the data obtained from the Canada Fitness Survey and the subjective reports of physicians and patients involved in the study, the applied statistical analysis generally used in scientific studies could not be used. As the data from the CFS was ordinal it could not be analysed using either parametric or nonparametric statistics. Although ordinal data can generally be analysed by nonparametric statistics, basic assumptions about the data must still be made.(Ferguson, 1981, Kerlinger, 1973.) The data obtained in this study violates even these assumptions. For instance, nonparametric analysis assumes a ceiling value exists (Bouffard, 1985). Question #10 of the survey asks how long a person has been active and has a response category with no ceiling or upper boundary; that of "greater than five years". Most nonparametric tests are based on differences between paired observations and, unlike parametric statistics, will 'throw out' or disregard any instances of a tie (ibid). As the majority of the second set of responses were identical to those given three months previous, most of the data in this study would be 'thrown out' and the few bits that remained from a nonparametric test would be biased and too few in number to be of use. In fact, the similar responses are important and should not be 'thrown out'.

This study was descriptive in nature. It was a very applied project and the results are largely based on the subjective response of the parties involved.

The data was analysed in the following manner:

1. Population demographics were tabulated and compared against those of the 1981 Canada Fitness Survey to determine the representativeness of the sample.

2. An SPSSx (descriptive statistical package) program was run and frequencies, bar graphs and limited condescriptive statistics obtained.

3. Subjective comments were treated using content analysis.

The treatment of the data merits further discussion and each of the three stages of data anlysis will be described independantly.

In any study one must question whether the group under study, is, in fact, representative of the population from which it was drawn. In this particular case, 'the population' refers to anyone in Canada who would have cause to use a family doctor at any time. It is assumed that this includes a significant portion of the entire Canadian population (ie. likely greater that 80%). The 1981 Canada Fitness Survey tested a total of 21,658 persons from both rural and urban areas of all ten provinces and two territories. Households were identified by Statistics Canada (Canada Fitness Survey, 1982). Although self-selection within the larger group randomly selected could occur, (ie. only those households with occupants who are conscientous of their lifestyle would agree to participate), the Fitness Survey made every reasonable effort to ensure that the sample group was large and representative of all Canadians. The CFS sample was used as a basis for comparing, and therefore checking the validity of, the group used in this study.

The most efficient manner of looking at the data from the survey was to determine frequencies, means, and variances and to represent these in graph form. Treatment in this manner also facilitated comparison with the CFS findings which were released in a similar form. The survey data was analyzed using SPSSx. The SPSSx program is a statistical package designed for computer use and encompasses a wide variety of options for analysing both parametric and nonparametric data (Norieses, 1983).

Perhaps the most difficult (and possibly contentious) area of treatment is that of the subjective material obtained throughout the study. This is further complicated by the project design and authors role in it. In traditional scientific research, the researcher controls some aspect of the environment and observes the "before and after" effect of the element of control.

Although the researcher may be the manipulator, they essentially play the role of observer and have objective criterion to assess the situation. In most sociological research, the researcher is again observing (usually human behavior) although potentially with less objectivity. Although the social scientist often gets closer to, or more involved with, their subjects than do their counterparts in 'pure' science, it is seldom that they are both the object under scrutiny and the scrutinizer. This study represented this rather unique combination. 'The researcher' planned to evaluate the effect an exercise physiologist would have on a medical family practice, yet the researcher was also the exercise physiologist in question. While all attempts at objective analysis were made, the situation cannot avoid a certain level of bias. Perhaps greater objectivity (but less control) would have been found had the researcher observed a second exercise physiologist.

> The involvement of the observer with observed can be categorized as role participant and/or affective participation. Role participation is more within the control of the observer than affective participation, which occurs when the observer's emotional responses are evoked during interaction.
>
> (Gilroy, 1982)

Advantages of this type of involvement include a more in depth understanding of this issue than could be gained from less involvement; a greater opportunity for observing all aspects of the project ie. patient and physician interaction, equipment, time and other logistical concerns, community response, etc.; yields more data and a higher response rate than many traditional methods of collecting data; provides the opportunity for direct interpretation of questions and comments of others. Disadvantages include the aforementioned issue of objectivity, the time and emotional committment necessary for this type of work, the amount of excess and possibly irrelevant information obtained and the effect of trying to obtain impressions about the program from people who are in fact discussing the researcher.

A prolific amount of work is available regarding the analysis of what is generally regarded to be descriptive data (the bulk of this coming from the sociocultural area). Unfortunately, the field is not as united as the pure sciences seem to be in defining the most

appropriate method of analysis for a given type of research. This problem is compounded by the fact that each of the numerous methods devised seemed to have no clear and sharp distinctions that enable a researcher to differentiate and choose the most appropriate methodology. For a study such as this, it would appear equally viable to use the methods of grounded theory as described by Turner (1981)(data obtained from, or grounded in, the real world), qualitative analysis (Glaser and Strauss, 1965), content analysis (Babbie, 1979) or a host of lesser-known but apparently well-suited processes.

The method of analysis chosen for this section is content analysis. Content analysis is one of the more time-tested methods of analysing sociological or descriptive information. Its use demonstrated an attempt at quantifying nominal or ordinal data. In 1952, Berelson suggested the researcher using this technique follow four steps:

1. Identify the communication to be examined ie. patient responses to interview.
2. Select the unit of analysis: this unit might be a particular word or theme, ie. perception of study, attitudes towards physical activity.
3. Develop categories ie. positive attitude versus negative attitude.
4. Select representative passages to illustrate discussion.

The process of content analysis is described in a number of sources (Berelson, 1952, Bowers, 1970, Kerlinger, 1973) but the one found to be most applicable to this project is that suggested by Babbie (1979). He has broken the process into what he calls manifest content analysis and latent content analysis.

> Burton and Dale suggest the difference between the two is that the former approximates the type of analysis applied to standardized questionnaires, consisting of counts of words, phrases and terms that have been judged as central or critical to the issue at hand. It reflects a quest for numerical objectivity in the analysis, but in so doing it negates to a considerable extent the richness of detail that is obtained through the unstructured interview. Latent content analysis, in contrast, requires the review of an entire paragraph or section of the transcript in order to identify its major thrust or intent. It is a means of discovering the subtleties and

> underlying depth of meaning in any communication. Manifest content analysis is concerned with specificity of understanding and as such it gives high reliability. It has disadvantages however in terms of validity. In contrast latent content analysis is concerned with depth of understanding. It emphasizes the desire for validity and the need to assure that the particular measure that is employed reflects accurately the true meaning of the phenomenon under study.
>
> (Slack, 1983)

Both latent and manifest content analysis were used in this report.

Chapter IV

RESULTS AND DISCUSSION

POPULATION DEMOGRAPHICS

A total of 154 people participated in both the original survey and the follow-up phone call. Participants are described in table 1.

Table 1. Population Demographics.

N=154

Distribution:
- from Misericordia = 52.6% (81 people)
- from Coronation = 47.4% (73 people)

Patients using services of exercise physiologist: 38%

Reason for using services:
- 77% offered opportunity to participate
- 17% by choice
- 6% referred by doctor

The 17% "by choice" group were at no time approached by either the researcher or their physician. Unfortunately, six of the patients who were referred by their physician were not included in the study as appointments to see the exercise physiologist were made by the receptionists in the absence of the exercise physiologist (all other participants had to see the researcher and receive a Canada Fitness Survey before an appointment was made). Therefore,

the first time the exercise physiologist saw the patient was at the actual appointment, at which point it was too late to have them fill out a survey. These referrals were reached at a later date for any comments they wanted to make.

In order to ensure that the sample would be indicative of the population of patients seen at the two clinics, subjects were chosen randomly as every fifth person who walked in the door. Throughout the five month period of sampling, only five patients declined to answer the survey when asked to do so. Interestingly, all five were senior citizens. Four of the five were not interested and one felt she was too sick to write.

For all parameters studied, no significant differences were found between the patients of the two clinics used in this study, despite the difference in their location in the city. As statistics describing patients of family practitioners could not be found, no claims can be made regarding the representativeness of the two groups studied here, to the patients seen by all general practitioners across Canada. However, there is no evidence to suggest that this sample is not similar to that of an urban family practice that includes obstetrics. It is probably not comparable to a rural practice due to differences in urban/rural population demographics. There is a difference between the population of western Canada versus eastern Canada versus the maritimes and these differences would likely be reflected in a family practice.

Comparing the group in this study to the Canada Fitness Survey group which included all provinces and both urban and rural communities revealed that:

1. The study group was significantly younger ($z=7.107$, $p<.01$)
2. The study group had significantly more females ($z=3.19$, $p<.01$)
3. There was no difference in marital status ($z=0.863$, $p<.05$)
4. The study group had significantly more education ($z=3.232$, $p<.01$)

The data was analysed for significance of difference using the method described by Ferguson (1981), pg. 185-187. Graphs comparing the Canada Fitness Survey sample and the sample under study are presented in Figures 1, 2, 3 and 4.

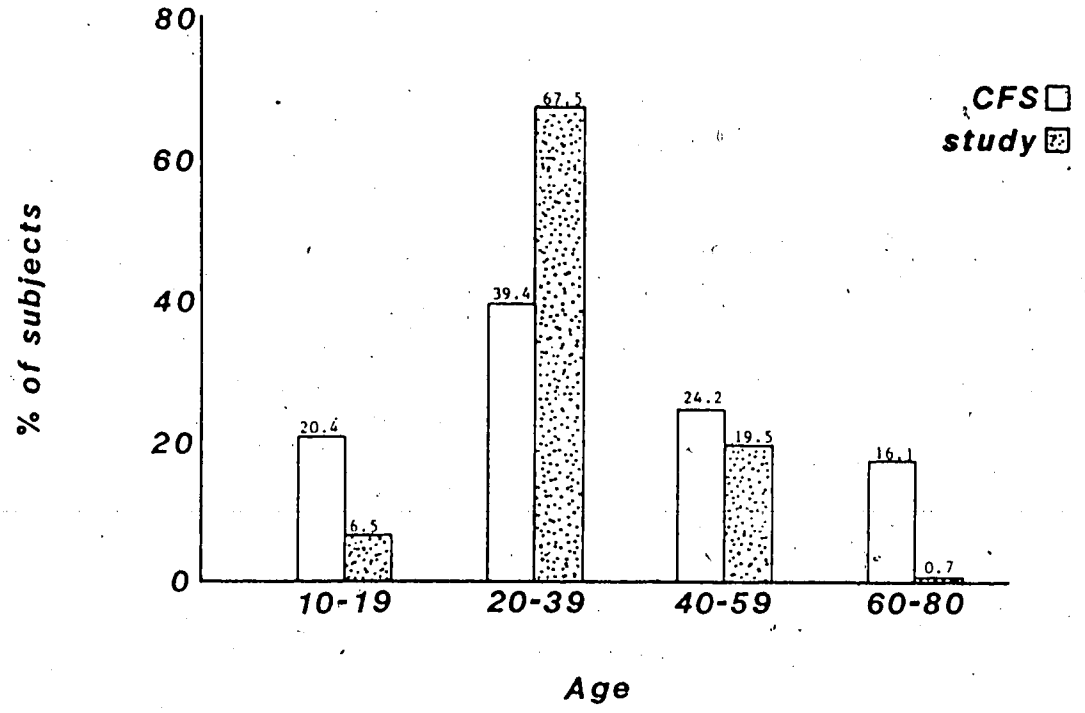

Fig. 1 Age of subjects in study vs CFS

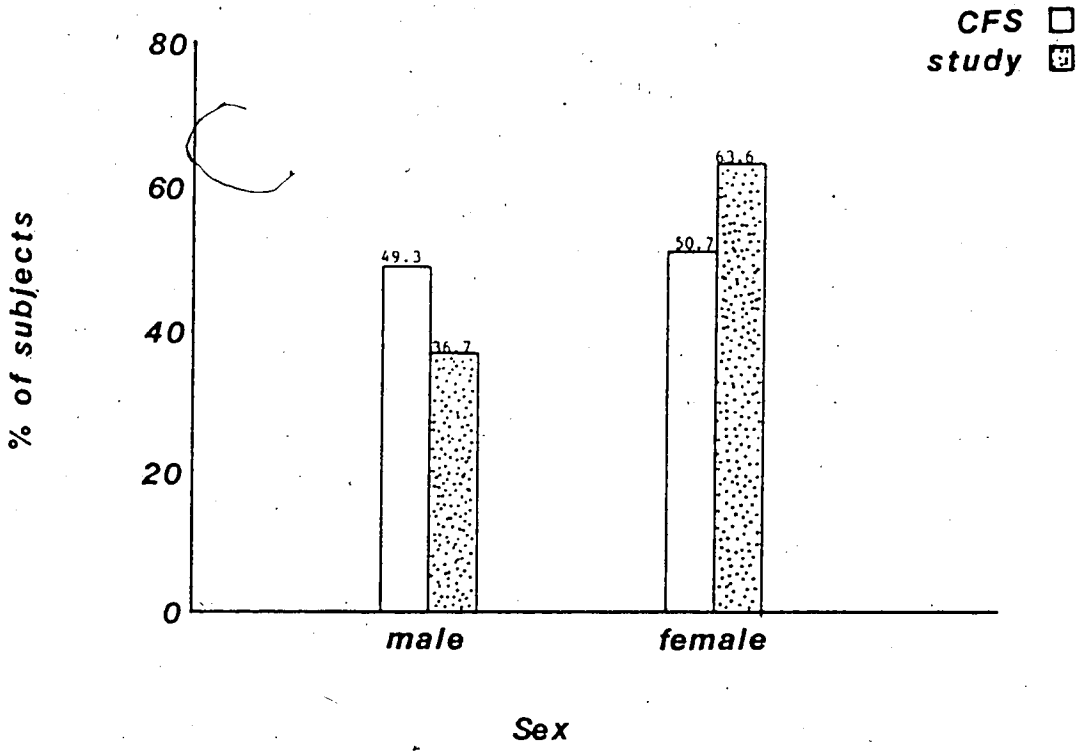

Fig. 2 Sex of subjects in study vs CFS

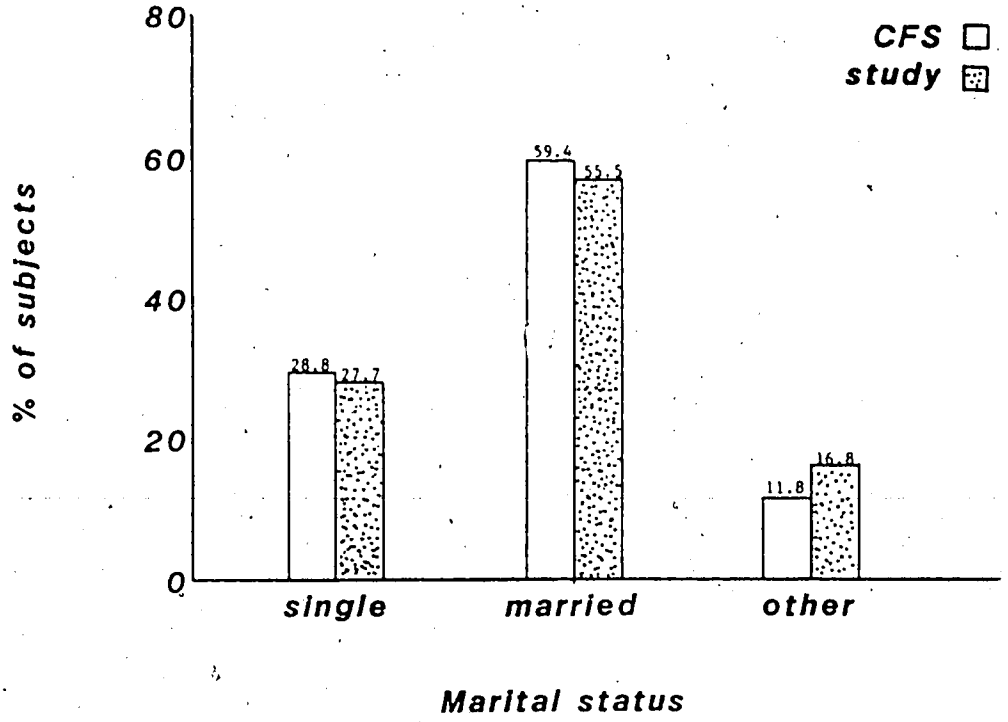

Fig. 3 Marital status of subjects in study vs CFS

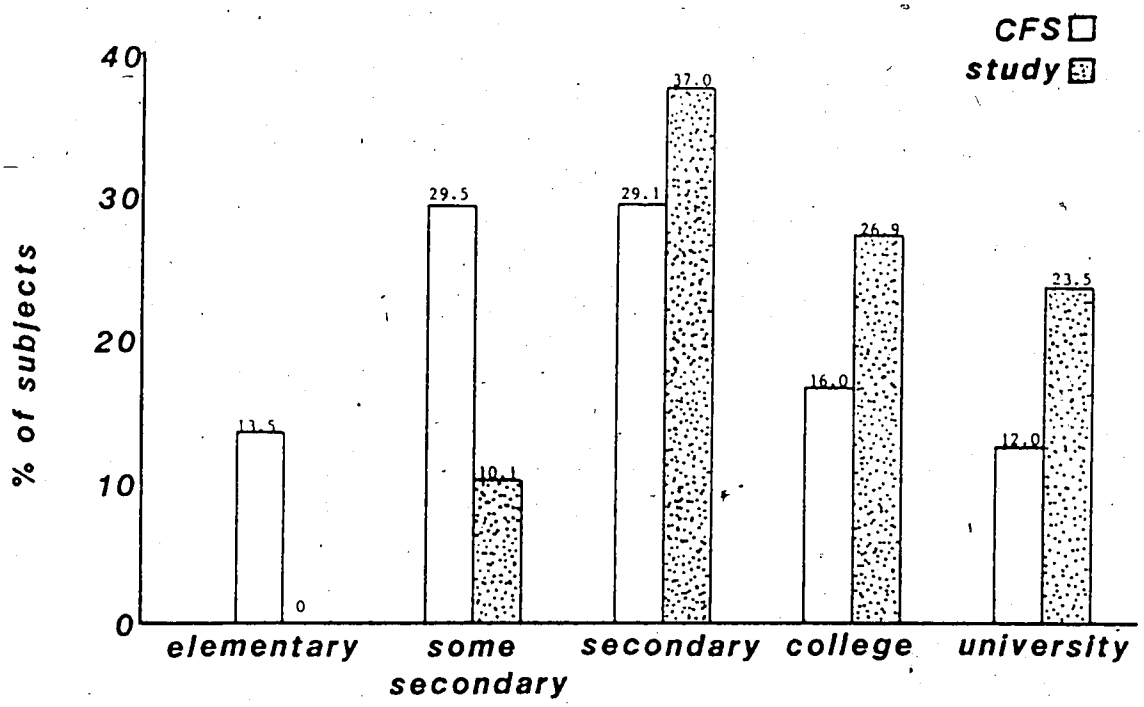

Fig. 4 Educational status of subjects in study vs CFS

HEALTH BEHAVIORS AND VALUES

In regards to health behaviors and values, the study group was similar to the larger Canada Fitness Survey group. The main areas of discrepency between the Edmonton group and the CFS data were: 1) the Edmonton group felt that controlling stress and maintaining proper weight were far more important; 2) the current sample had fewer smokers; 3) they did not feel that lack of facilities was a hindrance to being active. Comparisons between the results of this study (initial survey) to those of the Canada Fitness Survey are presented in Table 2.

EFFECT OF HAVING AN EXERCISE PHYSIOLOGIST AT THE CLINIC

In addition to the CFS survey, participants were asked an extra set of questions (Appendix H) regarding the exercise physiologist when contacted the second time.

Patients were first asked if they were aware that an exercise physiologist had been working at the clinic for the past five months. Eighty-one per cent (81%) of those contacted were aware that the exercise physiologist had been at their clinic (although some were unsure of what function she was performing). It is somewhat surprising that as many as 19% claimed they didn't know the exercise physiologist was at the clinic. Each participant had originally spoken to the exercise physiologist who introduced herself as such, briefly explained her prescence and then asked them to fill out the CFS. Stapled to the front of each survey was a page describing the study, the services offered and an invitation to participate (Appendix C). On the wall of each waiting room, an additional notice was posted. It was originally believed that if the exercise physiologist personally spoke to each participant, awareness of the program would be high. As advertising a new service or position, is not permitted in medical practice, these numbers may be the best that can be realized. It is also reasonable to assume that for many people, exercise is of no interest and having met an exercise specialist three months ago would not be something worth remembering.

Table 2 : Comparison of Fitness and Lifestyle Parameters: Study vs. 1981 CFS

Parameter	*CFS(%)*	*Study(%)*
1. Reasons for Being Active:		
Reason for not being active:		
time	25	37
facilities	17	1
lack self discipline	12	13
cost	7	5
don't want to	x	14
illness	19	7
other	20	23
2. Health Behaviors Rated as Very Important		
sleep	78	73
diet	68	73
low calorie snacks	27	19
proper weight	57	70
social activities	27	29
controlling stress	49	60
physical activity	46	51
moderate alcohol	45	38
not smoking	59	64
medical, dental care	63	62
positive thinking	45	44
3. Smoking		
Smoker	40	20
4. Self-Ratings of Health		
Rate health as "very good"	20	17

Thirty-eight per cent (38%) of the patients who filled out a survey used the services offered. Those who did not take advantage were asked why they did not. The reasons cited were: pregnant (7%), time (20%), meant to but forgot (13%), not interested (12%), didn't know about it (32%), various other reasons (16%). It is interesting to note that 32% of the people said they didn't use the services because they didn't know about them and yet earlier on,

only 19% had said that they didn't know the services were offered. This would appear to imply that approximately 13% of the group knew that an exercise physiologist was at the clinic but didn't know in what capacity or why, while 19% neither knew of the exercise physiologist or the services being offered. One possible solution would be to change the title from 'exercise physiologist' to 'exercise specialist' or 'fitness specialist' or some such label that would suggest the services offered.

Of those who did see the exercise physiologist, all but one rated the experience as being positive. The one who did not rate it as positive gave it a "medium" rating. Ninety-two per cent (92%) of respondents indicated that they learned something new which is very important in terms of promoting the service. Most of the people who came for a fitness test had at least a basic knowledge of fitness and lifestyle. This was not surprising since there has been extensive media coverage for several years. It was felt that too many counsellors deliver only that which is already common knowledge (ie."to lower body fat you should eat less and exercise more"). Participants were enthusiastic to learn more and were capable of handling more detailed information when it was presented in a clear manner.

Seventy-five per cent (75%) of those who saw the exercise physiologist said they changed some aspect of their fitness or lifestyle after their consultation. They were asked about changes in eating, smoking, drinking, exercise habits and attitude. Table 3 describes their responses.

Table 3 : Changes in lifestyle habits of patients who saw the exercise physiologist.

Parameter	*% Improved*	*% Worse*	*% No Change*
exercise	52	2	46
eating	41	2	57
smoking	12	3	85
drinking	7	3	90
attitude	40	3	57

In general, it can be said that approximately half the people who had been for a test or counselling claimed to have improved their eating and exercise habits and their attitude towards fitness and lifestyle while the other half remained the same. In a couple of cases, behavior actually regressed. For the majority., there was no change in smoking or drinking habits.

Before making any comments on the effectiveness of the exercise physiologist, one must also look at the changes in the habits of people who did not see the researcher over the same time period.

Table 4 : Changes in lifestyle habits of patients who did not see the exercise physiologist.

Parameter	*% Improved*	*% Worse*	*% No Change*
exercise	5	4	91
eating	17	3	80
smoking	7	2	91
drinking	3	2	95
attitude	1	1	98

The differences in the two groups are significant. Although the counselled groups had a greater number of subjects improve their smoking and drinking habits, the difference between the two groups is not significant. (The statistical treatment can be found in Appendix I). It appears then, that in this study, having a fitness test and a consultation with the exercise physiologist is associated with changes in behavior, particularly eating; exercise and attitude, for at least three months following the visitation. It would seem unlikely that by chance, all those who saw the exercise physiologist had additional outside factors that caused changes while at the same time all those who did not see the researcher were not exposed to these outside factors.

These results are encouraging and actually somewhat unexpected. In a review of fifteen fitness and lifestyle promotion programs, Godin and Shephard (1983) found that six groups saw an improvement after intervention while seven groups found no change. The interventions used in the reviewed studies were more agressive than those used at the Misericordia or Coronation Clinics and, therefore, less significant changes were expected in this research.

It is natural to question the validity of these findings. In discussing a similar study, although in an occupational rather than clinical setting, Donoghue, (1977) comments

> One may argue the validity of a subjective questionnaire. This apsect was examined with regards to self-reports concerning perceived level of fitness and percieved effects of the health program. Participants' reports on their percieved fitness level corresponded very well with their level of cardiovascular functioning.
> (Donoghue, 1977)

Heinzelmann (1969) found the same.

> In general a highly consistent and positive relationship was observed between these subjective and objective measures of program effects.
> (Heinzelmann, 1969)

All articles reviewed seem to support the finding that reported improvements are likely to be actual. There is no reason to believe that this would be any different for the group under study.

It is doubtful however, that these changes in behavior and attitude are permanent. Reid and Morgan (1973) found that

> Addition of a health education programme significantly improved compliance, as measured at three months. However, after six months the treatment and control populations had similar exercise patterns.
> (Reid and Morgan, 1973)

There is no reason to assume that the patients in this study would retain the behaviour changes to any greater extent. It is possible that if they were to recieve further reinforcement from the exercise physiologist or their physician, the process may be slowed or altered.

In an attempt to further strengthen the validity of the findings, participants were asked if they had experienced any major life changes (ie. recently unemployed, returned to school, injury, etc.). A large change in a persons life could also effect their fitness and lifestyle habits. It was found that thirteen people had recently had a baby, one had moved, one became

unemployed, two had suffered an illness or injury and one had lost a spouse. The remaining 136 participants had no major life changes. All but one (the one who had moved) were part of the control group ie. had not seen the exercise physiologist. Therefore, the improved habits of those who saw the exercise physiologist were likely not due to a major outside change.

Participants were next asked to judge whether they were more fit, less fit or about the same, compared to three months ago. Again, groups were separated into control and experimental.

Table 5 : Fitness compared to three months ago.

	% more fit	*% less fit*	*% same*
saw exercise physiologist	50	3	47
did not see exercise physiologist	16	19	65

There was a significant ($p<.001$) improvement in reported fitness level for those who saw the exercise physiologist. Fifty percent of those who had a consultation felt their fitness level improved compared to a 16% improvement in those who didn't have a consultation. These findings could not be further substantiated by a pre and post fitness test.

Lastly, the study looked at changes in attitude or values. Forty percent (40%) of those who saw the exercise physiologistreported an improved attitude, while only one percent (1%) of those who did not thought their attitude toward fitness and lifestyle had improved. To confirm these findings, patients were asked to rate a number of factors as being somewhere on a four

point scale of importance to non-importance. It was expected that if a change in attitude had in fact occurred, then the subject would value lifestyle factors as more important than they originally had

Upon analysis, it was found that this was not the case with the single exception of importance of physical activity. A significant number of people ($p<.05$) who saw the exercise physiologist valued physical activity more than they initially did. Changes to importance of sleep, diet, low calorie snacks, maintaining proper weight, social activities, stress, drinking, smoking, medical care and positive thinking were not significant. This was the area of greatest inconsistency. Participants from both groups occasionally had diametrically opposed views when called three months later (ie. they rated something as not important the first time and very important the second). There was also no consistency between or among groups for the direction of change. An individual may improve his attitude on one factor, regress on another and stay the same on a third. It would appear that the value scale used in the Canada Fitness Survey may not be a reliable tool. No data could be found to either support or refute the reliability of the value scale used in the CFS.

RELIABILITY AND VALIDITY

> A scale or test is reliable to the extent that repeat measurements made by it under constant conditions will give the same result (assuming no change in the basic characteristic -e.g. attitude- being measured). Ideally, one would wish to gauge reliability by repeating the scale (or test) on the same people using the same methods.
>
> (Moser and Kalton, 1971)

In order to maximize reliability the procedure described by Moser and Kalton (1971) was followed for this study. The Canada Fitness Survey was used as a pre and post test to the same group of people with a three month interval between tests. The method of delivery was

different for the two tests (the first was written, the second was verbal) although the wording and the questions remained the same.

One drawback to using the pre and post test format is that the participants could remember the first set of answers and repeat them the second time. The influence of simply completing the survey could also affect reliability. It is unlikely that this was the case with this study. The Canada Fitness Survey is far too long to remember the answers and with the three month delay most people didn't even realize they were answering the same questions. Although it may be possible, the data does not support the idea that people changed their lifestyle habits from filling out the survey alone.

Norris (1981) has suggested that asking the same type of question but in a different manner could enhance reliability and validity as one set of responses should corroborate the second. In this study an attempt was made to increase reliability by this technique through using the written survey on one occasion and an interview technique on the second.

> By validity is meant the success of the scale in measuring what it sets out to measure, so the differences between individuals scores can be taken as representing true differences in the characteristic under study.
>
> (Moser and Kalton, 1971)

No validation studies have been completed on the Canada Fitness Survey (Glassford). The only area of questionable validity found as a result of this research was the attitude scale (question #20). Patients claimed they had changed their attitude and yet this change was not made evident by the two sets of responses to question #20. However, it should be borne in mind that "an attitude is an abstraction and in consequence it is generally impossible to assess its validity directly."(Moser and Kaltan, 1971)

PATIENT COMMENTS

Throughout the study patients and staff were encouraged to provide feedback on the project. A 'comments' diary was maintained and, while many comments were not recorded, as many as possible were recalled later or recorded at the end of the conversation. In addition, patients were asked for their opinion of the trial and whether or not they would like to have an exercise physiologist associated with their clinic on an ongoing basis at the time of their three month follow-up phone call.

Virtually every patient in the study said they thought it was a good idea and would like to see it continued. This includes those who had not used the services and some who said they probably never would but thought it was beneficial and should be continued.

In an attempt to further explain why they would like to see the service offered, participants could be grouped into three categories. The first were those who wanted the services for personal benefit and use. This group tended to include those who already exercised regularly, were generally younger and those who had just seemed to notice that they were 'suddenly' getting fatter and/or less fit. This group either did take advantage of the services or claimed they would. Some of the patients considering themselves to be athletes expressed some frustration in trying to obtain exercise advice from their physicians previously and felt that "the exercise physiologist has more knowledge about this than my doctor does" and that "she spent a lot more time explaining things than my doctor ever did." This second point, regarding the time physicians have available per patient, was one of the initial reasons for doing this research. The general consensus seemed to be that "this is good for athletes because here we can get both types of care (medical and fitness) in one place." Another specific user was the pregnant woman. While most women were in their last trimester and therefore did not see the exercise physiologist, a number felt there was a need for fitness advice for pregnant and postnatal women and expressed a desire that they had been offered the services earlier.

Another group of people seemed to look on the services as a concrete form of preventative medicine. Only about one half of this group actually used the services but most thought it was a good idea and many said they would have used it had they known about it. Most felt that "diet and exercise are an integral part of health care and therefore should be a medical concern" but that "this is a part of health care that's usually overlooked." One patient felt that "all average unfit patients shoud be encouraged to see the person (exercise physiologist) - it might make them healthier." A cynic added "it could make the patients healthier and then they wouldn't have to go to the physicians so often. So I guess the doctors will never go for it." In general this group seemed to feel that "I'd rather have some preventative medicine now than a lot of pills later."

The last group was the smallest in number and they seemed to feel that it was a good idea but mostly for others. They failed to put themselves in the picture and appeared to have the greatest number of misconceptions about fitness. Comments like "I think it's a great idea for those who are young and fit" were not unusual. They seemed to have more faith in their physicians knowledge of fitness than the user group ("I know I'd be getting good information") and would feel more secure using a medical system for the delivery of fitness and lifestyle advice ("I'd feel more confident getting advice from the Misericordia rather than a commercial fitness center","I'd feel safer going to my doctors over a spa.")

Those who did have a test and counselling seemed to be "quite impressed with the overall experience." Approximately sixty percent asked if they could have a retest. A number of participants mentioned that "I thought I knew all about fitness and nutrition but I learned a few new things." Some mentioned that the experience has provided them with motivation to improve. Others sited specific changes ie. "I've lost ten pounds so far!" For those who were already fit it seemed to confirm that they were on the right track and provide a 'pat on the back'.

One of the more common patient comments related to not being made aware of the

program. (Despite the fact that all comments were from patients that were actually involved in it). Several said "my doctor never told me about it." This in fact occured often at the beginning of the study but was improving towards the end of the study. The nurses at each clinic told more patients about the services than did the physicians. It appears that mention of the program by their physician would legitimize the study in the mind of a number of patients. The participants offered a number of suggestions to improve awareness including "advertise" (illegal), "you should have a sign up to let patients know" (we did) and "patients should be told about it when they come in" (they were not only told about it, they were also given a written statement describing it). These last comments are somewhat frustrating in that they were suggesting exactly what was being done. Due to the restrictions placed on a medical clinic, there are several limitations in facilitating patient awareness. Word of mouth via physicians and nurses appears to be the most effective means of presenting a new service.

Patient concerns were few. One mentioned that "cost would affect any future use". It is likely that other patients share this viewpoint although no others expressed it. A physiotherapist who was also a patient and participant wanted to know "how your services would conflict with ours." She was told that the training required and the services provided are different and should not conflict.

Lastly patients had some ideas they thought would improve the services. They are:

* hold exercise classes
* offer babysitting
* make the exercise physiologists office more obvious
* make the campaign more aggressive
* provide more sophisticated testing for athletes
* provide joint services with the metabolic unit (Misericordia Hospital) because the two services compliment each other.

The first two suggestions (exercise classes and babysitting) and the suggestion to

provide more sophisticated testing would likely not be taken. These services are provided elsewhere and are not totally congruent with the purpose of a family practice. The suggestion to make the service more obvious does deserve serious consideration. This point was made repeatedly by the participants. Although facility layout and useage prohibited the exercise physiologists' office from being located in a highly visible location, it would not be unrealistic to have more signs directing patients to the testing area. The final suggestion was an interesting one. The patient who made it was referred to the hospitals metabolic unit four months prior to seeing the exercise physiologist. He felt that the information given by the exercise physiologist supported that which was given to him by the metabolic unit but that it was presented quite differently. Of interest, the information given to the patient by both the metabolic unit and the exercise physiologist was in disagreement with that given by the hospital nutritionist. The patient felt that the metabolic unit would be a most appropriate place for the exercise physiologist to be situated. This is a good suggestion and one that could be followed up in future research.

PHYSICIANS' COMMENTS

The two liason physicians (Dr. Jeff Robinson and Dr. John Mackel) were enthusiastic about the project and both involved themselves in its development, operation and assessment. Their partners in practice showed varying degrees of enthusiasm for the study. In general, the initial reaction of the seven other physicians involved would probably best be described as 'cautious agreement.' Most appeared to have a 'let's-wait-and-see' attitude with respect to any direct involvement. The residents training for Family Practice showed a much greater degree of enthusiasm and were more likely to encourage patients to participate. All physicians were asked for input and were told all reasonable modifications would be made if they disagreed with any part of the study. A couple of very minor suggestions were offered and acted upon.

There seemed to be two events that served as major turning points in terms of the

attitude of the physicians toward the study. The first, and the one of greatest impact, was a seminar open to all residents and physicians in family practice who send patients requiring hospitalization to the Misericordia Hospital. The first half hour of the seminar was spent on basic exercise principles, the second half hour on exercise prescription, followed by an open discussion. The physicians responded well and the feedback was positive. Three physicians who were not involved in the study asked if they could take part or if the researcher would accept their patients on a freelance basis. Unfortunately it was not possible to accept their involvement at that time.

Prior to the lecture, Dr. Jeff Robinson had been the only physician referring patients to the exercise physiologist. Following the lecture all physicians but two (coincidentally the same two who did not attend the seminar) began referring patients regularly. Unfortunately the seminar occurred four weeks before the end of the study so the period of referral was not a long one but offered the opportunity to observe the effect that such a seminar could have on the referral process.

The author can only surmise why one lecture would make a significant difference to the physicians. It may be that the physicians believed that they possessed the skills and knowledge necessary to provide the services themselves and therefore felt that they did not need an exercise physiologist. After attending the lecture they realized that exercise physiologists do possess skills and knowledge that is unique and that they themselves wouldn't be able to duplicate with a standard medical education.

The second event that seemed to affect the attitude and involvement of the physicians was participation in a fitness test and counselling session. For the first two or three months of the study, none of the physicians had come down to see the testing facility nor were they familiar with the protocol being used. Most were eventually convinced to partake. This was encouraged since it was assumed that if the physicians were familiar with the procedure being used with the patients then they would feel more comfortable in referring them. It is less likely

that a physician would refer a patient if they were unfamiliar with the service.

Most of the feedback from the physicians was verbal. Dr. Jeff Robinson submitted a written evaluation on behalf of himself and his partners at the Coronation Medical Clinic and Dr. John Mackel also provided a written assessment (appendices K and L respectively).

The feedback received was generally positive. Those physicians who had referred their patients reported

> The response from the patients was excellent. In particular they were in favor of the opportunity to be given well informed individual advice. It was mentioned that the counselling sessions gave them a realistic view of their fitness and what they had to do to improve it. They also felt that this format provided excellent motivation for change. Several patients commented on the appropriateness of having an exercise physiologist affiliated with a physician's office.
>
> (Robinson, 1985)

Physicians at the Coronation Medical Clinic expressed concern over the use of the Health Hazard Appraisal, in particular with the suggestion made on the HHA printout that women have a yearly Pap smear. This advice differs with that given to their patients (who are told to have a Pap smear every three to five years). Physicians at the Misericordia expressed concern over the length of the CFS questionaire and in particular to patients confusion over how to answer questions one to three. In general, the physicians

> all agreed that the experience was a positive one. They felt that this could be a valuable service to attempt to improve the physical activities of patients. In practice, the motivation provided by the counselling sessions with you was of considerable importance in changing the attitudes of patients.
>
> (Robinson, 1985)

Dr. Robinson and his colleagues submitted four recommendations:

1. Give more extensive explanation directly to all the physicians involved in the referral process outlining the services provided to the patients. This should

include the details of assessment and recommendations with examples.

2. Provide written direct feedback to the patients attending physician in the form of a report outlining the findings of the assessment and the recommendations made to the patient. This would allow the physician to follow and reinforce the patients progress.

3. Have an easily accessible and central location for referral with well delineated hours.

4. Affiliate with other health care professionals including a dietician to allow for coordination of the management of closely related lifestyle problems.

> In summary it appears that the involvement of an exercise physiologist in a family clinic setting was positive from the physicians viewpoint and, at least subjectively, it was of benefit to the patients.
>
> (Robinson, 1985)

COST FEASIBILITY

> The measures of effectiveness of health practices used in the analysis should be outcome oriented, with length of life and quality of life as the ulitmate measure .... The tradeoff between present and future health benefits and cost must be considered. This consideration is particularly important for screening preventative programs for which the costs are immediate but the health benefits are in the future.
>
> (Weinstein, 1977)

A traditional cost-effectiveness analyses, as described in the New England Journal of Medicine (ibid), could not be used for this study. Such an analysis requires information that to

date has not been investigated, such as morbidity changes due to intervention by an exercise physiologist. Instead, an assessment of cost required to have an exercise physiologist work in a medical family practice has been developed.

The assessed costs for office use and supplies are based on the use of a ten by ten foot office in the Misericordia Family Clinic at prices effective February, 1985. (Appendix J) Costs would vary considerably from practice to practice depending on the number of partners in the practice, location of the clinic, etc. For instance, office space in downtown Edmonton rents for approximately $9-12 per square foot plus operating costs ($6 per square foot) compared to $5-6 per square foot for spaceaway from the city centre. (Currie, 1985).

Appendix J provides a list of monthly expenses for an exercise physiologist a) working in a medical family clinic, b) having a one-room office in a professional building and c) having a two room office in a downtown leased office building. These costs were determined by the Office Manager of the Misericordia Family Clinic based on 1985 prices.

Under similar conditions to those of this study, it would cost approximately $33,676 per year for the salary of the exercise physiologist plus office space, maintenance and secretarial help. In addition, there would be an initial $4,370 expense for testing equipment and office furnishings.

Assuming the exercise physiologist worked regular office hours (9:00 - 5:00) and took three weeks holiday per year, 1,960 people could be seen in one hour appointments. In order to cover the yearly expenses, each patient would have to be charged $17.18 per visit. This is significantly below competetive rates of $30 - $75 per fitness test in commercial establishments. Centers that include blood work with a fitness assessment have been charging up to $150. If patients were charged $35 per visit a profit of $34,927 could be realized. This value may vary considerably depending on the number of patients seen, additional duties of the exercise physiologist, fee charged, etc. It does appear however that an exercise physiologist could at

least generate enough income to cover their expenses, and likely bring in additional monies.

These findings are consistent with the two practical cases where an exercise physiologist is currently working in a medical practice. One exercise physiologist is under salary at Sacred Heart Hospital in Cumberland, Maryland. The hospital recoups his expenses by billing insurance for services he renders and by direct fee-for-services charges for fitness assessments. The second example has an exercise physiologist working in a small family practice clinic in rural Salina, Kansas. "Larry Muff, clinic business manager, estimates that in a small, well-organized clinic an exercise physiologist can easily generate $60,000 in charges annually."(Hage, 1981). It should be noted that the exercise physiologist at the Kansas clinic assists with stress tests which brings in greater revenue (they charge $150 per stress test). The exercise physiologist at the hospital does not conduct stress tests. A description of his duties and how billing for his services are arranged is provided in Appendix A.

A true cost analysis must also consider benefit. No work has been done to assess the cost benefit of using an exercise physiologist in a medical setting to date. For the purpose of this analysis, such data has been taken from research in the field of employee fitness.

Shephard and Renzland investigated medical care costs for the year preceding, during and following a year long employee fitness program. They found that, following a year of intervention by an exercise physiologist,

> the annual health care savings amount to 0.57 hospital days per employee year, plus $28.50 in medical fees, an overall sum of about $85 per individual. To this must be added other savings in terms of reduced absenteeism and employee turnover.
>
> (Shephard and Renzland, 1981)

At an approximate cost of $17 and a benefit of $85 it can be seen that the addition of an exercise physiologist to a medical family clinic is not only financially sound, it should show long-term benefit.

Table 6 : Cost to Add an Exercise Physiologist to Staff of Medical Family Practice

Item	*$ Per Annum*	*$ Total*
1. Salary		29,426
a. wage	27,000	
b. benefits	2,426	
2. Office		3,780
rent, utilities, telephone, secretarial		
3. Consumable supplies		570
a. postage	60	
b. stationery	110	
c. computer	160	
d. duplicating	240	
	Grand Total:	$33,776

Table 7 : Capital Costs

Item	*Cost*	*Total*
1. Office equipment		953
a. desk and chair	462	
b. filing cabinet	160	
c. furniture	329	
2. Testing		3,417
a. 2 bicycle ergometers	2,154	
b. 2 Sportesters	400	
c. 1 sphygmomanometer	75	
d. 1 stethoscope	35	
e. 1 pr. fat calipers	176	
f. 1 stopwatch	75	
g. 1 metronome	80	
h. 1 flexibility board	115	
t square	17	
igh scale	85	
dynamometer	205	
	Grand Total:	$4,370

Chapter V

OBSERVATIONS AND CONCLUSIONS

OBSERVATIONS

The initial response of the staff of both clinics to the study seemed to be one of wariness. The receptionists and support staff were convinced it would mean extra work for them despite assurances that it would not. The physicians, although agreeing to have the researcher work in their clinics, seemed skeptical and did not involve themselves nor inform their patients of the new services. The initial response may have been due to a lack of understanding regarding what the study was about and how the staff members would be affected by implementation of the project. The researcher repeatedly attempted to meet with the staff of each clinic to explain the project in the months preceeding its initiation but the meetings were never arranged. As the staff came to know the researcher and realized that the project would not be an extra burden they became extremely supportive.

The patients response was enthusiastic at all stages of the program. The exercise physiologist was kept busy with appointments throughout the study. It would appear that patient interest would not be a limitation to having an exercise physiologist work in a family practice setting. The fact that patients were not charged for services in this study deserves consideration. This factor may reduce the number of patients wanting to use the services. This could be offset by having more than one clinic share the exercise physiologist. Considering the fact that no other example of an exercise physiologist working in a family practice could be found in Canada, the market is potentially large. (There are however exercise physiologists working in sportsmedicine clinics at the University of British Columbia and at Dalhousie University.)

As mentioned earlier, by the last half of the project, the physicians also seemed convinced of the benefit of the project and became more involved. Many of the physicians

involved approached the researcher about continuing the work independently once the project was completed. A number of physicians and physiotherapists who were not involved in the study also expresed interest in the project.

As the patients, the staff, the physicians and the exercise physiologist involved in this study all seemed to view it positively there is but one question remaining: "Is it feasible?".

To be feasible there must first be a need for the service to be offered. From the physicians viewpoint there is a demonstrated need. There are three factors that prevent physicians from providing the same services to their patients - they don't have the educational training to duplicate the services, they don't have the time and they don't have a means of billing health care and therefore receiving payment for their work (Alberta Health Care does not have a category for which testing or lifestyle counselling can be claimed) (Alberta Health Care Plan). From the patients viewpoint, a number expressed their concern with the fitness information and advice they had received from commercial establishments and stated that they felt safer receiving such information from a medical environment. In a medical clinic patients would be assured that the exercise specialist would have the requisite qualifications, that their medical history would be considered and that their physician would have knowledge of their programs.

There would appear to be sufficient numbers to use the services. In this study, 36% of those randomly approached took advantage. If only 36% of all patients at the Misericordia and Coronation Medical Clinics took advantage then 2,808 patients from the Misericordia and 3,600 patients from the Coronation would see the exercise physiologist. It was previously determined that if an exercise physiologist did nothing but see patients all day, every day (one hour appointments), then the most he/she could see would be 1,960 patients per year. Therefore, the patients of the two clinics used in this study alone could keep an exercise physiologist employed full time.

The project did accomplish one of its' primary goals. Patients who saw the researcher made signifcant changes to their fitness and lifestyle habits and reported that they felt better because of it. Whether the reported changes will be maintained beyond three months is not known. The degree to which the changes are the result of the researchers personality and interpersonal skills as opposed to her professional capacity is also unknown. Another exercise physiologist in the same situation may elicit greater or lesser patient response.

The final consideration is that of cost. If an exercise physiologist were to work in a medical family clinic they would have to generate enough income to meet wage, rental and office expenses. Cost feasibility was discussed earlier. Under economic conditions similar to those of Edmonton at the time of this study, it is likely that a family practice could employ an exercise physiologist and that the exercise physiologist could operate at no net expense to the clinic. The author was able to find two examples of exercise physiologists working in family practice situations in the United States(Lefew, 1984, Hage, 1981). One worked at a small family practice in rural Kansas and the other worked out of a hospital in Cumberland, Maryland. Both generate an income greater than their expenses. However, one of these exercise physiologists perform cardiac stress tests which would bring in a great deal more than would fitness evaluations alone.

From the exercise physiologists point of view, for the job to be rewarding and motivating, the services provided would have to be expanded (as they are in the examples from the United States). A technician could be hired (at a lower salary) to perform fitness evaluations and provide exercise prescriptions. Doctors would be negligent in failing to take full advantage of any exercise physiologist they hired. In Edmonton, acute cardiac rehabilitation is provided at two of the hospitals and a cardiac care center. However, there is nothing except a course at the YMCA for extended cardiac rehabilitation. Patients could benefit greatly from such a service. There are also a number of patient groups that, again physicians can't spend extended time with, and for which community services are limited or non-existent. Programs,

seminars, exercise classes and personal counselling could be implemented for patients with back problems, chronic pain, asthma, arthritis or for pre and post natal women. Patients preparing for surgery or those requiring extended periods in bed could be given specific programs to follow. An exercise physiologist could also assist the physician with pre-participation screenings. Doctors routinely take only resting blood pressure and heart rate which do not necessarily indicate how the patient will respond to participation in some form of activity. Employee fitness could benefit the staff and community relations could be strengthened by talks or participation on committees. An exercise physiologist working in a hospital setting could provide in service training or seminars for the medical staff. There is a need for more research in the areas of preventative and corrective exercise, and lifestyle management and the effect of exercise on specific medical ailments that an exercise physiolgist would be well-suited to investigate.

SUMMARY

An exercise physiologist worked in two medical clinics practising family medicine for a period of five months. The ultimate purpose of the study was to determine the feasibility of such an arrangement. This was accomplished by assessing changes in lifestyle habits and attitudes of patients who saw the exercise physiologist, by analysing the evaluations of the physicians and patients involved and by assessing the cost feasibility.

One hundred and fifty-four patients were involved in the complete study. Patients were compared to the larger Canadian sample used by the Canada Fitness Survey and found to be younger, better educated and composed of more females. Lifestyle habits and attitudes were similar except that the Edmonton group was composed of fewer smokers and felt that controlling stress and maintaining proper weight were more important than did the national sample. Those who saw the exercise physiologist did make significant improvements in their

eating and exercise habits and attitude. They felt they were fitter than they had been prior to seeing the exericse physiologist. Patients felt that the exercise physiologist provided a useful service and would like to see the arrangement continued. Doctors, while initially cautious, became enthusiatic and supportive and also recommended that the project become a regular service. On paper, it is cost feasible for a family practice to employ an exercise physiologist. In practice, two American examples were found but none in Canada.

With the exception of charging patients, this study serves as a good example of what an exercise physiologist would experience in integrating their services in a medical family clinic.

CONCLUSIONS

Based on the results of this study, it is both feasible and desirable to have an exercise physiologist become an integral part of a medical family practice. The services provided by the exercise physiologist were unique in this setting and did not duplicate any existing services. Patient and cooperating physician responses were positive and lifestyle behaviour changes were demonstrated.

RECOMMENDATIONS

Based on the results of this study the following recommendations could be made to exercise physiologists or physicians contemplating a similar employment experience:

1) That a second pilot project be initiated to confirm or refute the findings of this study.
2) That patients be charged for services and that the exercise physiologist receive a salary to establish cost-feasiblity.
3) That the exercise physiologist provide a greater range of services (unless the physicians are contemplating hiring a technician only).

4) That medical and clerical staff be better informed of the role of the exercise physiologist within their clinic.

5) That greater efforts to establish and define the role of exercise physiologists within the allied health professions be made.

6) That a longitudinal study be conducted to investigate long term patient compliance to a fitness and lifestyle intervention program.

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APPENDIX A: Correspondence from Exercise Physiologist at Sacred Heart Hospital

SACRED HEART HOSPITAL

900 Seton Drive

Cumberland, Maryland 21505

301-729-4200

Dear Ms. Smith,

In response to your letter, a job description is enclosed with an explanation of the responsibilities of the exercise physiologist at Sacred Heart Hospital.

The duties vary depending upon the area of involvement. The exercise physiologist works independently operating the adult fitness program for employees and public. All fees for the adult fitness are paid by the individual and not insurance covered. The extra expenses are covered from the general hospital operating budget. Within the adult fitness program the exercise physiologist does a physical fitness test battery for each participant. Then subsequently writes the exercise prescription and discusses the results with the individual. All supervision, leadership, and instruction are also performed by the exercise physiologist.

The next responsibility of the exercise physiologist is the hospital's out-patient, hospital-based Cardiac Rehabilitation. This service is for post-M.I. and post-bypass patients. The duties include patient and physician contacts regarding the service, assisting the low-level GXT, the exercise prescribing, supervising and monitoring of patients and all administrative needs. Most insurance companies pay 80%-100% of the fees; the patients pick-up the remaining costs.

The hospital offers a chronic pain management program on an out-patient basis. The exercise physiologist directs and supervises the on-going exercise therapy portion of the program. Most insurances cover 80%-100% of these costs, also. Basicallly, physical activity

programs are developed for each patient consisting of calesthenic and endurance type exercises.

In general, the exercise physiologist performs other requests related or unrelated to the mentioned services (i.e., GXT's, patients [illegible]ng, public talks, committees, etc.). The exercise physiologist is paid one salary independent of revenue produced.

I hope this information has been helpful. If you could send me a summary of your findings it would be appreciated.

Good luck,

Bruce LeFew, M.A.

Exercise Physiologist

JOB DESCRIPTION

TITLE: Exercise Physiologist

DEPARTMENT: Education

SUPERVISOR: Director of Education

1. Purpose of this job:

   To provide exercise physiology expertise for hospital services related to adult fitness, cardiac rehabilitation, and pain management.

2. Duties:

   a. Develop and direct physical fitness programs for employees and public.

   b. Provide fitness evaluations and ensure medical clearence for all physical fitness participants.

   c. Develop and supervise cardiac rehabilitation, Phase 2.

   d. Work on committees as assigned by Administrator and Department Head.

   e. Promote physical fitness activities through presentations and lectures for employees and public.

   f. Develop and direct exercise therapy for pain management.

3. Supervision Received:

   Works with relatively little or no supervision. Receives some administrative guidance from Director of Education.

4. Judgement Exercised in Performance of Duties:

   Position requires sound professional and administrative judgement. Requires ability to be flexible in scheduling sessions and testing and must be precise in exercise programming.

5. Relationships With Other People:

   Establish and maintains good working relationship with internal contacts

(administration, hospital department and employees); external contacts (physicians, community members and agencies), and patients (cardiac rehab, pain management, and psychiatric).

6. Training of Others:

Plan and develop programs and inservices related to health promotion topics (i.e.,exercise, hypertension, weight control, etc.)

7. Physical Requirements:

Good physical condition required for this position. Must demonstrate activities (i.e., walking/jogging, rowing, biking, weights) and participate with members when needed for instructional purposes.

8. Qualifications/Requirements:

Masters Degree in Exercise Physiology with some experience in fitness and cardiac programming or Bachelors Degreee in related discipline with 1-2 years experience in fitness and cardiac programming.

The follwing certifications ensure proper qualifications of personnel: ACSM Program Director, Exercise Specialist, Exercise Test Technologist.

APPENDIX B: Canada Fitness Survey

PHYSICAL ACTIVITIES

WHAT YOU DO AT WORK OR AT SCHOOL OR IN THE HOME, PLUS YOUR ACTIVITY IN YOUR LEISURE TIME ALL CONTRIBUTE TO YOUR CURRENT LEVEL OF FITNESS. THE FOLLOWING QUESTIONS WILL PROVIDE A COMPLETE PICTURE OF ALL YOUR ACTIVITIES.

TO HELP YOU DESCRIBE YOUR ACTIVITIES, WE HAVE DESIGNED FOUR QUESTIONS – ONE FOR THOSE YOU DO DAILY, ONE FOR THOSE YOU DO EACH WEEK, ONE FOR THOSE YOU HAVE DONE IN THE LAST MONTH, AND THE FOURTH FOR THOSE ACTIVITIES YOU HAVE DONE IN THE LAST YEAR.

1. DAILY ACTIVITIES

For those activities which you do most days of the week (such as work, school and housework), how much time do you spend. . .

	Almost all of the time	About 3/4 of the time	About 1/2 of the time	About 1/4 of the time	Almost none of the time
Sitting	01 1	2	3	4	5
Standing	02 1	2	3	4	5
Walking	03 1	2	3	4	5
Walking up stairs	04 1	2	3	4	5
Lifting or carrying heavy objects	05 1	2	3	4	5

2. WEEKLY ACTIVITIES

Please refer to the reference card for a list of activities. Answer the following for the physical activities you do each week.

Light housework and handywork: washing dishes, ironing, making beds, mowing lawn, etc

Number of occasions each month: J F M A M J J A S O N D (06 07 08 09)

Average time actually spent on each occasion: Hrs (10) Mins (11)

Intensity: Light – Slight change from normal (12 = 1); Medium – Some perspiration, Above normal breathing (2); Heavy – Heavy perspiration, Heavy breathing (3)

Heavy housework and handywork: washing and waxing floors, painting, etc

Number of occasions each month: J F M A M J J A S O N D (13 14 15 16)

Average time actually spent on each occasion: Hrs (17) Mins (18)

Intensity: Light – Slight change from normal (19 = 1); Medium – Some perspiration, Above normal breathing (2); Heavy – Heavy perspiration, Heavy breathing (3)

Name of activity (20) _____ (21)

Number of occasions each month: J F M A M J J A S O N D (22 23 24 25)

Average time: Hrs (26) Mins (27)

Intensity: Light (28 = 1); Medium (2); Heavy (3)

Organized in levels or in a league: Yes (29 = 1) No (2)

Competitive: Yes (30 = 1) No (2)

Name of activity (31) _____ (32)

Number of occasions each month: J F M A M J J A S O N D (33 34 35 36)

Average time: Hrs (37) Mins (38)

Intensity: Light (39 = 1); Medium (2); Heavy (3)

Organized: Yes (40 = 1) No (2)

Competitive: Yes (41 = 1) No (2)

Name of activity (42) _____ (43)

Number of occasions each month: J F M A M J J A S O N D (44 45 46 47)

Average time: Hrs (48) Mins (49)

Intensity: Light (50 = 1); Medium (2); Heavy (3)

Organized: Yes (51 = 1) No (2)

Competitive: Yes (52 = 1) No (2)

Name of activity (53) _____ (54)

Number of occasions each month: J F M A M J J A S O N D (55 56 57 58)

Average time: Hrs (59) Mins (60)

Intensity: Light (61 = 1); Medium (2); Heavy (3)

Organized: Yes (62 = 1) No (2)

Competitive: Yes (63 = 1) No (2)

3. ACTIVITIES IN THE LAST MONTH

Please refer to the reference card for a list of activities. Answer the following for the physical activities you have done at least once in the last month. **(Do not include activities already listed in Weekly Activities.)**

Gardening and cultivating such as spading, digging, weeding

Occasions in the last month — 01

Average time actually spent on each occasion — Hrs 02, Mins 03

Intensity — Light: Slight Change from normal state 1; Medium: Some perspiration Above normal breathing 2; Heavy: Heavy perspiration Heavy breathing 3 — 04

Shovelling snow

Occasions in the last month — 05

Average time actually spent on each occasion — Hrs 06, Mins 07

Intensity — Light: Slight Change from normal state 1; Medium: Some Perspiration Above normal breathing 2; Heavy: Heavy perspiration Heavy breathing 3 — 08

Mowing the lawn (pushing a power mower)

Occasions in the last month — 09

Average time actually spent on each occasion — Hrs 10, Mins 11

Intensity — Light: Slight Change from normal state 1; Medium: Some perspiration Above normal breathing 2; Heavy: Heavy perspiration Heavy breathing 3 — 12

Name of activity — 13 to 14

Occasions in the last month — 15

Average time — Hrs 16, Mins 17

Intensity — Light 1, Medium 2, Heavy 3 — 18

Organized in levels or in a league — Yes 1, No 2 — 19

Competitive — Yes 1, No 2 — 20

Name of activity — 21 to 22

Occasions in the last month — 23

Average time — Hrs 24, Mins 25

Intensity — Light 1, Medium 2, Heavy 3 — 26

Organized — Yes 1, No 2 — 27

Competitive — Yes 1, No 2 — 28

Name of activity — 29 to 30

Occasions in the last month — 31

Average time — Hrs 32, Mins 33

Intensity — Light 1, Medium 2, Heavy 3 — 34

Organized — Yes 1, No 2 — 35

Competitive — Yes 1, No 2 — 36

Name of activity — 37 to 38

Occasions in the last month — 39

Average time — Hrs 40, Mins 41

Intensity — Light 1, Medium 2, Heavy 3 — 42

Organized — Yes 1, No 2 — 43

Competitive — Yes 1, No 2 — 44

Name of activity — 45 to 46

Occasions in the last month — 47

Average time — Hrs 48, Mins 49

Intensity — Light 1, Medium 2, Heavy 3 — 50

Organized — Yes 1, No 2 — 51

Competitive — Yes 1, No 2 — 52

Name of activity — 53 to 54

Occasions in the last month — 55

Average time — Hrs 56, Mins 57

Intensity — Light 1, Medium 2, Heavy 3 — 58

Organized — Yes 1, No 2 — 59

Competitive — Yes 1, No 2 — 60

4. ACTIVITIES IN THE LAST YEAR

Please refer to the reference card for a list of activities. Answer the following for the physical activities you have done in the last 12 months.

(Do not include activities you have already listed.)

	Months in which activity was done	Number of occasions in last 12 months	Average number of minutes spent on each occasion
	J F M A M J J A S O N D		15 or less / 16 to 30 / 31 to 60 / 61 or more
Walking for exercise	01 02 03 04 05 06 07 08 09 10 11 12	13	14 15 16 17
Jogging (using short strides)			
Running (using long strides)			
Bicycling			
Home exercise (push-ups, sit-ups)	18 19 20 21 22 23 24 25 26 27 28 29	30	31 32 33 34
Exercise classes			
Weight training			
Yoga			
Golf (walking and carrying clubs)	35 36 37 38 39 40 41 42 43 44 45 46	47	48 49 50 51
Racquetball			
Squash			
Tennis			
Baseball	52 53 54 55 56 57 58 59 60 61 62 63	64	65 66 67 68
Softball			
Ice hockey			
Curling			
Swimming at a pool	69 70 71 72 73 74 75 76 77 78 79 80	81	82 83 84 85
Cross country skiing			
Alpine/Downhill skiing			
Ice skating			
Names of activities:			
86 87 _____	88 89 90 91 92 93 94 95 96 97 98 99	100	101 102 103 104
105 106 _____	107 108 109 110 111 112 113 114 115 116 117 118	119	120 121 122 123

PHYSICAL ACTIVITY IN YOUR LEISURE TIME

5. Here is a list of reasons why some people do physical activities during their leisure time. How important is each of these to you?

	Very important	Of some importance	Of little importance	Of no importance
To feel better mentally and physically	01 ☐ 1	☐ 2	☐ 3	☐ 4
To be with other people	02 ☐ 1	☐ 2	☐ 3	☐ 4
For pleasure, fun or excitement	03 ☐ 1	☐ 2	☐ 3	☐ 4
To control weight or to look better	04 ☐ 1	☐ 2	☐ 3	☐ 4
To move better or to improve flexibility	05 ☐ 1	☐ 2	☐ 3	☐ 4
As a challenge to my abilities	06 ☐ 1	☐ 2	☐ 3	☐ 4
To relax or reduce stress	07 ☐ 1	☐ 2	☐ 3	☐ 4
To learn new things	08 ☐ 1	☐ 2	☐ 3	☐ 4
Because of fitness specialist's advice for improving health in general	09 ☐ 1	☐ 2	☐ 3	☐ 4
Because of doctor's orders for therapy or rehabilitation	10 ☐ 1	☐ 2	☐ 3	☐ 4
Other	11 ☐ 1	☐ 2	☐ 3	☐ 4

6. With whom do you *usually* do your physical activities in your leisure time?

12 ☐ No one
13 ☐ Friends
14 ☐ Immediate family or relatives
15 ☐ Co-workers
16 ☐ Classmates at school
17 ☐ Others

7. When do you *usually* do your physical activities? (Indicate one only.)

18 ☐ 1 Weekdays
☐ 2 Weekends
☐ 3 Both

8. At what time do you *usually* do your physical activities? (Indicate more than one if you usually do activities *more than once a day*.)

19 ☐ In the morning
20 ☐ At lunchtime
21 ☐ In the afternoon
22 ☐ In the evening
23 ☐ At no special time

9. Where do you *usually* do your physical activities? (Indicate one or more.)

24 ☐ Home
27 ☐ Work
30 ☐ School, college or university facility
25 ☐ Park
28 ☐ Recreational facility
31 ☐ Other
26 ☐ Commercial facility or private club
29 ☐ Outside using no special facility

10. How long have you been doing some physical activity in your leisure time at least once a week?

32 ☐ I don't do an activity each week
33 ☐ For less than 3 months
34 ☐ From 3 months to just under 6 months
35 ☐ From 6 months to just under 1 year
36 ☐ From 1 year to just under 3 years
37 ☐ From 3 years to just under 5 years
38 ☐ Five or more years

11. Comparing yourself to others of your own age and sex, would you say you are. . . .

39 ☐ 1 More fit
☐ 2 Less fit
☐ 3 As fit

12. If you want to participate more in physical activities than you do now, why aren't you able to? (Check at most 3 reasons.)

- 01 ☐ I don't want to participate more
- 02 ☐ Ill health
- 03 ☐ Injury or handicap
- 04 ☐ Lack of energy
- 05 ☐ Lack of time because of work (school)
- 06 ☐ Lack of time because of other leisure activities
- 07 ☐ Costs too much
- 08 ☐ No facilities nearby
- 09 ☐ Available facilities are inadequate
- 10 ☐ No leaders available
- 11 ☐ Requires too much self-discipline
- 12 ☐ Lack the necessary skills
- 13 ☐ Other _____

13. If you wanted to participate more in physical activities, which of the following would increase the amount of physical activity you do? (Check at most 3.).

- 14 ☐ Nothing
- 15 ☐ Better or closer facilities
- 16 ☐ Different facilities
- 17 ☐ Less expensive facilities
- 18 ☐ More information on the benefits of doing physical activity
- 19 ☐ Employer or union sponsored activities available
- 20 ☐ Organized sports available
- 21 ☐ Organized fitness classes available
- 22 ☐ Fitness test with personal activity program available
- 23 ☐ People with whom to participate
- 24 ☐ Common interest of family
- 25 ☐ Common interest of friends
- 26 ☐ More leisure time
- 27 ☐ Other _____

14. Which of the following have you heard of?

- 28 ☐ Canadian Home Fitness Test
- 29 ☐ Canada Games
- 30 ☐ Canada Fitness Awards
- 31 ☐ FIT KIT
- 32 ☐ INFORMaction
- 33 ☐ PARTICIPaction
- 34 ☐ Standardized Test of Fitness
- 35 ☐ Fitness and Amateur Sport
- 36 ☐ Fitness Canada
- 37 ☐ 5 BX/10 BX
- 38 ☐ Exercise Break
- 39 ☐ Canada Fitness Facts

15. What is the name of your provincial fitness program?

- 40 ☐ No provincial program
- 41 ☐ Don't know

Name of program:

42 _____

Office Use

43 ☐

PARTICIPACTION

16. Have you ever seen this symbol?

01 ☐ 1 Yes ☐ 2 No — Go to question 17 ☐ 3 Not Sure — Go to question 17

Where have you heard of or seen the PARTICIPaction symbol or message? (Indicate all applicable.)

02 ☐ On television
07 ☐ On radio
12 ☐ In newspapers
03 ☐ In magazines
08 ☐ In booklets or pamphlets
13 ☐ On billboards
04 ☐ On posters
09 ☐ On buses or subways
14 ☐ On milk cartons
05 ☐ On T shirts
10 ☐ At school
15 ☐ At ParticiParks
06 ☐ In 'Fitness: The Facts'
11 ☐ Student notebooks
16 ☐ Don't know

17. Have you previously taken a physical fitness test?

17 ☐ 1 Yes ☐ 2 No — Go to question 18 ☐ 3 Don't know — Go to question 18

What type of cardio-vascular (aerobic) exercise did this test use?

18 ☐ 1 Stepping ☐ 2 Treadmill ☐ 3 Walk/Jog/Run
☐ 4 Bicycle ☐ 5 Other _____

Where did you take this fitness test?

19 ☐ 1 YMCA/YWCA ☐ 2 Commercial club or facility ☐ 3 University
☐ 4 Work or school ☐ 5 Other _____

When did you take this test?

20 ☐ 1 In the last 6 months ☐ 2 From 6 months to 1 year ago ☐ 3 Over 1 year ago

Were you satisfied with the way the test was explained and administered?

21 ☐ 1 Very satisfied ☐ 2 Satisfied ☐ 3 Not at all satisfied

Has taking the fitness test increased the amount of physical activity you do?

22 ☐ 1 Yes ☐ 2 No ☐ 3 Don't know

18. In the past year, what physical activities have you stopped doing?
(Do not include those stopped due to a change in the season.)

23 ☐ 1 None or Activity 24 _____ Office Use 25

Why did you stop doing this activity? 26 _____ Office Use 27

Activity 28 _____ Office Use 29

Why did you stop doing this activity? 30 _____ Office Use 31

19. What physical activities would you like to start in order to improve your fitness and health?

01 ☐ None or Activity 02 _____ Office Use 03

What is the main reason you have not yet started this?

04 _____ Office Use 05

Activity 06 _____ Office Use 07

What is the main reason you have not yet started this?

08 _____ Office Use 09

Activity 10 _____ Office Use 11

What is the main reason you have not yet started this?

12 _____ Office Use 13

20. How important are each of the following to you in gaining a feeling of well being?

	Very Important	Of some Importance	Of little Importance	Of no Importance
Adequate rest and sleep	14 ☐1	☐2	☐3	☐4
A good diet	15 ☐1	☐2	☐3	☐4
Low calorie snacks between meals	16 ☐1	☐2	☐3	☐4
Maintenance of proper weight	17 ☐1	☐2	☐3	☐4
Participation in social and cultural activities	18 ☐1	☐2	☐3	☐4
Control of stress	19 ☐1	☐2	☐3	☐4
Regular physical activity such as exercise, sports or games	20 ☐1	☐2	☐3	☐4
Using alcohol moderately or being a non-drinker	21 ☐1	☐2	☐3	☐4
Being a non-smoker	22 ☐1	☐2	☐3	☐4
Adequate medical and dental care	23 ☐1	☐2	☐3	☐4
Positive thinking/meditation	24 ☐1	☐2	☐3	☐4

LIFESTYLE AND YOUR HEALTH

21. What do you *usually* eat for breakfast? (*Usually means at least four days a week.*) Check all that apply.

25 ☐ I don't eat breakfast
26 ☐ Eggs
27 ☐ Bacon or other meat, fish or poultry
28 ☐ Bread, danish or donut
29 ☐ Granola
30 ☐ Other cereals
31 ☐ Fruit or fruit juice
32 ☐ At least 6 ounces of milk
33 ☐ Cheese
34 ☐ Yogurt
35 ☐ Tea or coffee

22. In the last year, have you been eating . . .

sweet foods and candies	36 ☐1 More	☐2 Less	☐3 Same amount as before
fruit and vegetables	37 ☐1 More	☐2 Less	☐3 Same amount as before
fats and fried foods	38 ☐1 More	☐2 Less	☐3 Same amount as before
salt and salty food	39 ☐1 More	☐2 Less	☐3 Same amount as before
meals on a regular basis	40 ☐1 More	☐2 Less	☐3 Same amount as before
the same amount of food or calories	41 ☐1 No, more	☐2 No, less	☐3 Same amount as before

23. About how often do you *usually* drink alcohol?

01
- [1] More than once a day
- [2] 4 to 7 times a week
- [3] 1 to 3 times a week
- [4] 1 to 3 times a month
- [5] Less than once a month
- [6] I don't drink alcohol — Go to question 24

About how many drinks do you usually have at a time?

Where one drink is: — one pint of beer — 12 ounces
— one small glass of wine
— one shot of liquor or spirits
i.e. 1 - 1 1/2 ounces with or without mix.

02
- [1] One
- [2] Two or three
- [3] Four or five
- [4] Six or seven
- [5] Eight or more

24. Which of the following best describes your experience with tobacco. Check all that apply.

03
- [1] I haven't smoked

I currently smoke:

04
- [1] cigarettes occasionally
- [2] less than 1/2 pack of cigarettes daily
- [3] about a pack of cigarettes daily
- [4] two or more packs of cigarettes daily
- [5] a pipe, cigar or cigarillo occasionally
- [6] a pipe, cigar or cigarillo daily

I stopped smoking:

05
- [1] cigarettes recently
- [2] cigarettes over a year ago
- [3] a pipe, cigars or cigarillos recently
- [4] a pipe, cigars or cigarillos over a year ago

25. Here is a list that describes some of the ways people feel at different times. During the past few weeks, how often have you felt . . .

		Often	Sometimes	Never
On top of the world?	06	[1]	[2]	[3]
Very lonely or remote from other people?	07	[1]	[2]	[3]
Particularly excited or interested in something?	08	[1]	[2]	[3]
Depressed or unhappy?	09	[1]	[2]	[3]
Pleased about having accomplished something?	10	[1]	[2]	[3]
Bored?	11	[1]	[2]	[3]
Proud because someone complimented you on something you had done?	12	[1]	[2]	[3]
So restless you couldn't sit long in a chair?	13	[1]	[2]	[3]
That things were going your way?	14	[1]	[2]	[3]
Upset because someone criticized you?	15	[1]	[2]	[3]

26. About how many hours of sleep do you *usually* get each day?

01
- [1] Six hours or less
- [2] Seven
- [3] Eight
- [4] Nine
- [5] Ten
- [6] Eleven hours or more

27. Are you limited in the *type* or *amount* of work you can do (or school you can attend) because of an illness, injury or handicap?

02
- [1] No
- [2] Yes, because of a temporary illness
- [3] Yes, because of a chronic or long-term illness
- [4] Yes, because of a temporary injury
- [5] Yes, because of a permanent injury or handicap

28. Are you limited in the *type* or *amount* of physical activity you can do during your leisure time because of an illness, injury or handicap?

03
- [1] No
- [2] Yes, because of a temporary illness
- [3] Yes, because of a chronic or long-term illness
- [4] Yes, because of a temporary injury
- [5] Yes, because of a permanent injury or handicap

29. In general, how would you describe your state of health?

04
- [1] Very good
- [2] Good
- [3] Average
- [4] Poor
- [5] Very Poor

SOME FACTS ABOUT YOU

30. Were you born in Canada?

05
- [1] Yes
- [2] No

31. What language do you use all or most of the time? Check one only.

06
- [1] English
- [2] French
- [3] German
- [4] Italian
- [5] Ukrainian
- [6] Other _____

32. Is there another language that you are in the habit of using?

07
- [1] None
- [2] English
- [3] French
- [4] German
- [5] Italian
- [6] Ukrainian
- [7] Other _____

33. Are you . . .

01 ☐ 1 Male ☐ 2 Female

34. How old are you?

02 ☐☐ Years

IF YOU ARE 14 YEARS OF AGE OR YOUNGER,
YOU HAVE FINISHED THE QUESTIONNAIRE.

THANK YOU!

WE WOULD BE GRATEFUL FOR YOUR COMMENTS.
A SPACE FOR THIS HAS BEEN LEFT ON THE LAST PAGE.

IF YOU ARE 15 YEARS OF AGE OR OLDER, . . .

35. What is your present marital status? Are you presently . . .

03
☐ 1 Married
☐ 2 Widowed
☐ 3 Divorced
☐ 4 Separated
☐ 5 Single (Never married)

36. What is the highest level of education you have reached?

04
☐ 1 Elementary or less
☐ 2 Some secondary
☐ 3 Secondary diploma
☐ 4 Some post-secondary
☐ 5 Post-secondary diploma or certificate
☐ 6 Community college or CEGEP diploma
☐ 7 One or more University degrees

37. Are you . . . (Check all that apply.)

05
☐ 1 Retired
☐ 2 Employed full-time
☐ 3 Employed part-time
☐ 4 Student full-time
☐ 5 Student part-time
☐ 6 Homemaker/Housewife full-time
☐ 7 Homemaker/Housewife part-time
☐ 8 Unemployed or on strike
☐ 9 Other ☐☐☐☐☐☐☐☐☐☐

38. How many hours a week do you spend doing your main activity? (work, going to school, housework)

06 ☐☐ hours

39. How many hours a week do you spend doing other chores?

07 ☐☐ hours

40. How many hours a week do you have for doing leisure activities?

08 ☐☐ hours

41. Have you worked or had a job in the past 2 weeks?

01 [1] Yes

[2] No — Go to question 43

What kind of work do you do? (eg. posting invoices, selling shoes, etc.) Please provide as much detail as possible.

02 _____

03 _____

For whom do you work? (Name of business, government department, agency, person, or are you self employed?)

04 _____

05 _____

What kind of business, industry or service is this? (eg. paper box manufacturing, retail shoe store, municipal board of education.)

06 _____

07 _____

42. Is there an opportunity for physical recreation where you work?

08 [1] Yes, at lunch

[2] Yes, at coffee break

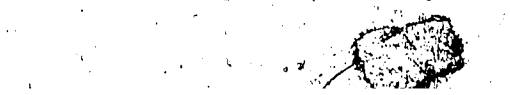
[3] Yes, after work

08 [2] No

43. Approximately what was your family's total income last year, before taxes?

09
- [1] Less than $5,000
- [2] $5,000 to $9,999
- [3] $10,000 to 14,999
- [4] $15,000 to $24,999
- [5] $25,000 to $29,999
- [6] $30,000 to $35,000
- [7] Over $35,000
- [8] Don't know

APPENDIX C: Explanation of Study



The Misericordia Family Clinic will be partaking in a study in which an exercise physiologist will be spending two days per week at the clinic on a trial basis for a six month period.

Services offered to patients include fitness and lifestlye counselling, fitness testing, exercise prescription and a series of seminars on fitness and lifestyle topics. These services are provided at no charge to patients of the clinics. Appointments to see Karen can be made with her in room FP-106. Fitness tests will be conducted at the Misericordia nurses residence gym. (Immediately north of the Family Clinic). Counselling, seminars, etc. will be held at the Misericordia Family Clinic.

During this time a study will be conducted to determine patients present physical activity and lifestyle patterns and to investigate any changes in these as a result of interaction with the exercise physiologist. This will be accomplished by analyzing responses to the fitness and lifestyle survey. All responses are strictly confidential and anonymity is guaranteed. Those who do not wish to see the exercise physiolgist are still encouraged to participate by filling out a survey. The completed questionnaire is then returned to room FP-106. Your co-operation in filling this out is appreciated.

I will be happy to answer any question you may have regarding the study or the services offered. I look forward to meeting you!

Sincerely,

Karen Smith, Exercise Physiologist

Fitness Testing Information Sheet

You have been scheduled for a physical assessment on ..... at ..... .Please be sure you have read the follwing information before you come for your test.

If there is any medical or other reason why it is not safe for you to participate in the test you will not be permitted to do so (ie. recent MI, medication that alters your response to exercise, etc).

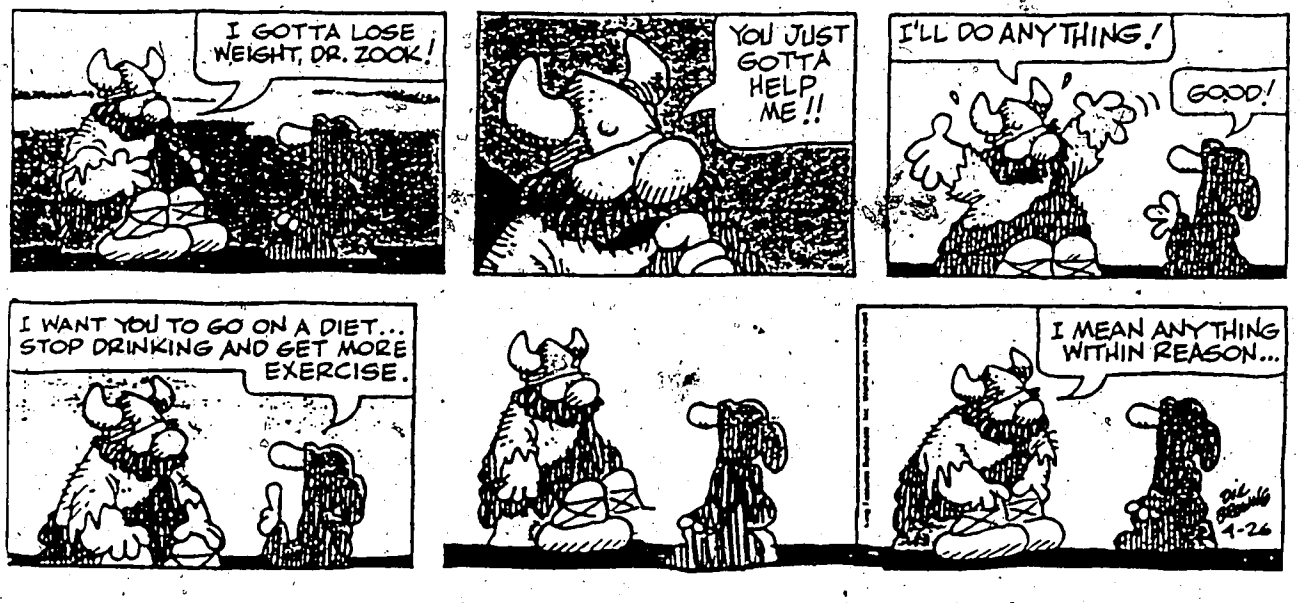
Do not eat (heavily), smoke or engage in physical activity 2 hrs. prior to the test. Do not consume alchohol 6 hrs. prior to the test. These all negatively affect test results.

Wear t-shirt, shorts or sweats and running shoes. Women should not wear leotards or similar one-piece outfits.

Please complete and return the Evaluate questionairre befoe the day of your test. (Results are run through the computer 1 day prior to the testing so they will be ready when you arrive).

If for any reason you are not able to make your appointment, please call and let us know.

Remember: This is not a try-out for the Olympics! This is an assessment to determine your strengths and weaknesses for your personal knowledge and so that we are better able to counsel you and prescribe exercise.



APPENDIX D: Fitness Test Protocols

FITNESS TEST PROTOCOLS

1. Standard height and weight.

2. Body fat.

   As per CSTF Operations Manual (following pages).

3. Cardiovascular.

   a. resting heart rate and blood pressure taken

   b. seat height adjusted, workload estimated

   c. pedal ergometer at first workload [illegible] of 60 rpm, for 4 minutes

   d. exercise BP and HR taken

   e. if no contraindications, second workload, same rate, for 4 minutes

   f. exercise BP and HR taken at 7:30 minutes

   g. stop exercising

   h. post-exercise BP and HR taken at 0:30 and 2:30 minutes

4. Grip Strength.

   As per CSTF Operations Manual (following pages).

5. Flexibility.

   As per CSTF Operations Manual (following pages).

6. Muscular Endurance.

   As per CSTF Operations Manual (following pages).

Skinfold Measurements

Equipment:

Harpenden caliper

Procedure

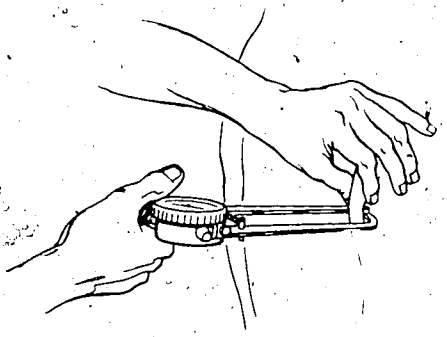
Select the prescribed site. Grasp the skinfold between the thumb and index finger 1 cm above the site and apply pressure.

The skinfold is raised and *maintained* with the thumb and forefinger with the crest of the fold following the specified alignment. Apply the caliper jaws at right angles to the prescribed site. Release the spring handles fully. Read the measurements after the full pressure of the caliper jaws has been applied, and the drift of the needle has ceased.

Record to the nearest "0.2 mm".

Repeat measurements twice. If the difference is greater than 1 mm, take a third measure and record the mean of the closest pair in the space provided:

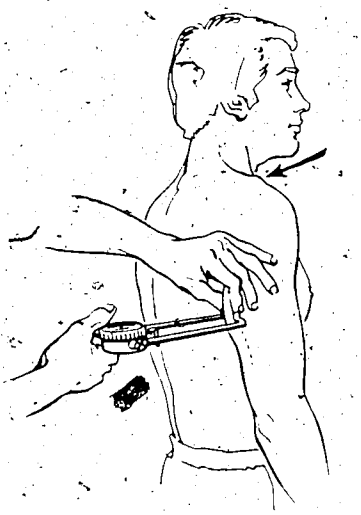
e.g. 1 6 . 4



Triceps skinfold

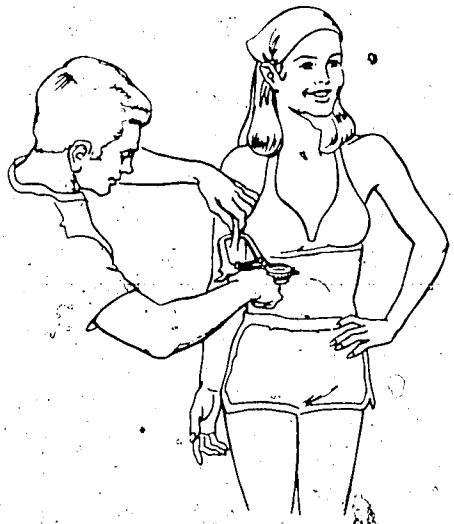
Measured on the back of the unclothed pendant right arm at a level midway between the tip of the acromion (see arrow→) and the tip of the elbow.

With the forearm flexed at an angle of 90°, establish the midpoint. This can be approximated with the thumbs by placing the fifth finger of the left hand on the subject's right shoulder and the fifth finger of the right hand on the tip of the subject's elbow. Lift the skinfold parallel to the long axis of the arm. Ask the subject to lower the forearm and then apply the caliper jaws to the site.



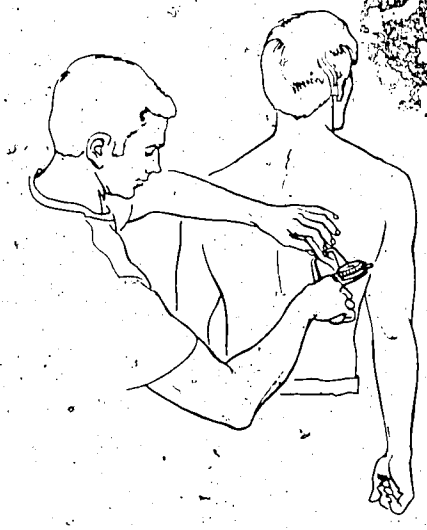
Biceps skinfold

Measured on the front of the right pendant upper arm over the biceps at a level midway between the acromion and the tip of the elbow as described for the triceps. The skinfold is lifted parallel to the long axis of the upper arm.



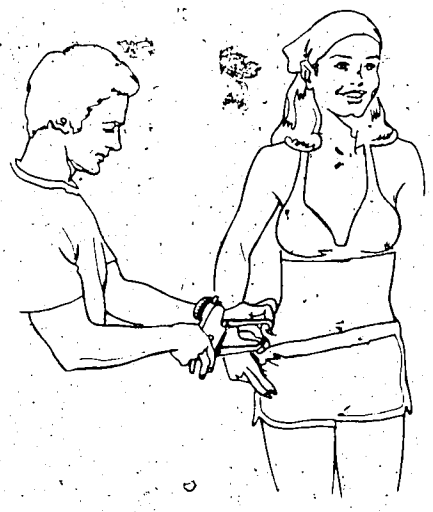
Subscapular skinfold

With the subject standing, measured about 1 cm below the lower angle of the right scapula. The crease of the skinfold that is lifted should run at an angle of about 45° downwards from the spine.



Supra-iliac skinfold

Measured 3 cm above the iliac crest, with the fold running parallel to the crest. The fold should be taken at the midline of the body.



Note:

Remember that the accuracy of your measurement depends on:

— precise identification of the site of the skinfold;

— forming the skinfold prior to the application of the caliper jaws;

— the standardization of the alignment of the skinfold crest; and

— complete release of the spring handles of the caliper.

Muscular Strength

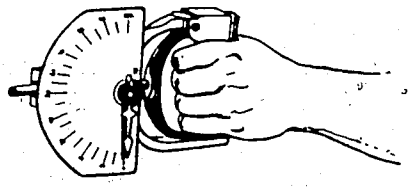
Hand grip strength

Equipment:

Stoelting hand grip dynamometer

Procedure

Adjust the grip of the dynamometer to the most comfortable setting for the hand size of the subject. Lock in place. The second joint of the fingers should fit snugly under the handle and take the weight of the instrument.



Have the subject take the dynamometer in the appropriate hand, holding it in line with the forearm and letting it down by the thigh. The grip is taken between the fingers and the palm at the base of the thumb. When firmly gripped, the instrument is held away from the body and squeezed vigorously, exerting maximum force. During the test neither the hand nor the dynamometer should be allowed to touch the body or any other object. Measure both hands alternatively giving two trials per hand. Add the best score for each hand and record as a single score to the nearest "kg" in the highlighted area as follows:

0	9	0

Trunk Forward Flexion (Sitting)

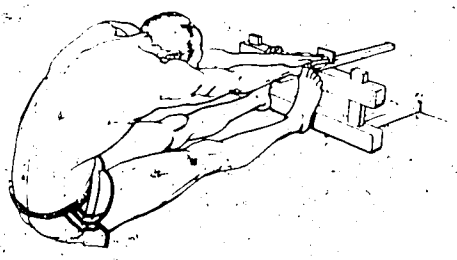
Equipment:

Modified Wells and Dillon sit and reach apparatus.

Procedure

Have the subject warm-up for this test by performing slow stretching movements before taking actual measurements. The subject, barefoot, sits with the legs fully extended with the soles of the feet placed flat against the horizontal crossboard of the apparatus, with the inner edge of the sole placed 2 cm from the scale. Keeping the knees fully extended, arms evenly stretched, palms down, the subject bends and reaches forward (without jerking) pushing the sliding marker along the scale with the fingertips as far forward as possible. The position of maximum flexion must be held for approximately two seconds. The test is repeated twice. Do not allow jerking movements. If the knees flex, the trial is not counted. DO NOT ATTEMPT TO HOLD THE KNEES DOWN. Record the maximum distance reached to the nearest 0.5 cm in the highlighted area as follows:

1	6	.	5



Note.

The subject should not attempt this test if bothered by low back pain or other ailments.

Advise the subject that lowering the head will maximize the distance reached.

60-Second Sit-Ups (Optional)

If the subject does not want to perform this test, is over the age of 50, or in poor physical condition as assessed in the previous tests and measurements, omit this test and leave the recording space blank.

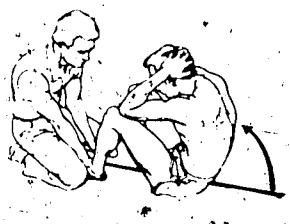
Equipment:

Mat (optional), timer

Procedure

The subject lies in a supine position, knees bent at a right angle, and feet about 30 cm apart. The hands with fingers interlocked are placed behind the head and must be maintained in this position for the whole duration of the test.

Hold the ankles of the subject and ensure that the heels are in constant contact with the mat. When ready, give the command "Begin". The subject is required to sit up and touch the knees with the elbows and return to the starting position. The subject will perform as many repetitions as possible within one minute. The subject may pause whenever necessary.



Note:

Ensure that the subject's back returns to its initial position, that the interlocked fingers make contact with the mat or floor and that the subject exhales when sitting up. Record the number of sit-ups completed in 60 seconds in the highlighted area as follows:

3	0

Completing the Testing Session

Inform the subject that the testing session is over. Complete and provide the subject with the Assessment Report booklet. If this is not feasible, arrange an appointment for this purpose.

Push-Ups (Optional)

If the subject does not want to perform this test, is over the age of 50, or in poor physical condition as assessed in the previous tests and measurements, omit this test and leave the recording space blank.

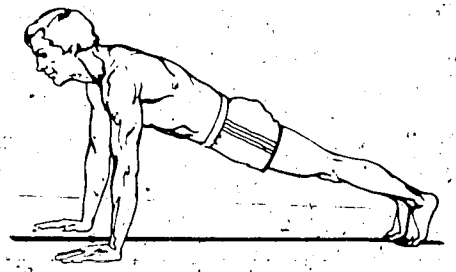
Equipment:

Mat (optional)

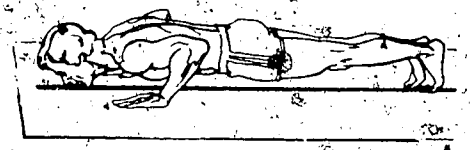
Procedure

Males

The subject lies on his stomach, legs together. Hands pointing forward, are positioned under the shoulders. The subject pushes up from the mat by straightening the elbows and using the toes as the pivotal point.

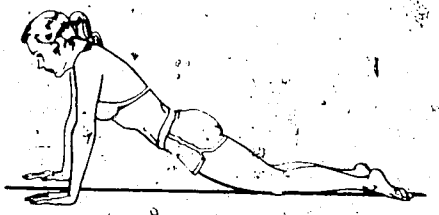


The upper body must be kept in a straight line. The subject returns to the starting position, *chin to the mat*.

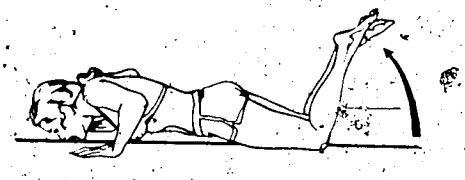


Females

The subject lies on her stomach, legs together. Hands pointing forward, are positioned under the shoulders. The subject pushes up from the mat straightening the elbows and using the knees as the pivotal point.



The upper body must be kept in a straight line. The subject returns to the starting position, *chin to the mat*, allowing the feet to swing upwards simultaneously.



Note:

The push-ups are to be performed consecutively and without a time limit. The test will be discontinued as soon as the subject is seen to strain forcibly to complete a push-up. If the subject's feet slip, assist by placing your feet behind and perpendicular to the subject's feet.

Count the initial movement and each repetition successfully completed. Record in the highlighted area as follows:

0	1	5

APPENDIX E: Equipment List

EQUIPMENT LIST

Monark bicycle ergometer

Sphygmomanometer and stethoscope

Sportester (heart rate monitor)

Metronome

Lange fat calipers

Weight scale

Measuring tape

Grip dynamometer

Flexibility board

Gym mat

Stopwatch

APPENDIX F: Consent Form

Consent for Fitness Test

I, ..., authorize the exercise physiologist to conduct a physical fitness assessment.

The assessment is comprised of tests to determine my cardiovascular function, flexibility, body fatness, muscular strength and muscular endurance. During the cardiovascular test I will be riding a bicycle ergometer at two specified workloads for a total of eight minutes. These workloads are designed to elevate my heart rate to within a specified target zone. Blood pressure and heart rate will be monitored during this test.

The test follows standard protocol and is considered very safe. If at any time I experience any unusual discomfort I am free to discontinue the test. The exercise physiologist may also ask me to discontinue the test at any point in time.

I acknowledge that I have read the above and understand the procedures involved. I agree to participate at my own risk and waive legal recourse against the tester, Coronation Medical Center, Misericordia Family Clinic, Misericordia Hospital and the University of Alberta.

Signed: .....

Date: .....

APPENDIX G: Par-Q

Physical Activity Readiness Questionnaire (PAR-Q)*

PARTICIPANT IDENTIFICATION _____

PAR Q & YOU

PAR-Q is designed to help you help yourself. Many health benefits are associated with regular exercise, and the completion of PAR-Q is a sensible first step to take if you are planning to increase the amount of physical activity in your life.

For most people physical activity should not pose any problem or hazard. PAR-Q has been designed to identify the small number of adults for whom physical activity might be inappropriate or those who should have medical advice concerning the type of activity most suitable for them.

Common sense is your best guide in answering these few questions. Please read them carefully and check (√) the ☐ YES or ☐ NO opposite the question if it applies to you.

YES	NO	
☐	☐	1. Has your doctor ever said you have heart trouble?
☐	☐	2. Do you frequently have pains in your heart and chest?
☐	☐	3. Do you often feel faint or have spells of severe dizziness?
☐	☐	4. Has a doctor ever said your blood pressure was too high?
☐	☐	5. Has your doctor ever told you that you have a bone or joint problem such as arthritis that has been aggravated by exercise, or might be made worse with exercise?
☐	☐	6. Is there a good physical reason not mentioned here why you should not follow an activity program even if you wanted to?
☐	☐	7. Are you over age 65 and not accustomed to vigorous exercise?

If You Answered

YES to one or more questions

If you have not recently done so, consult with your personal physician by telephone or in person BEFORE increasing your physical activity and/or taking a fitness test. Tell him what questions you answered YES on PAR-Q, or show him your copy.

programs

After medical evaluation, seek advice from your physician as to your suitability for:

- unrestricted physical activity, probably on a gradually increasing basis.
- restricted or supervised activity to meet your specific needs, at least on an initial basis. Check in your community for special programs or services.

NO to all questions

If you answered PAR-Q accurately, you have reasonable assurance of your present suitability for:

- A GRADUATED EXERCISE PROGRAM - A gradual increase in proper exercise promotes good fitness development while minimizing or eliminating discomfort.
- AN EXERCISE TEST - Simple tests of fitness (such as the Canadian Home Fitness Test) or more complex types may be undertaken if you so desire.

postpone

If you have a temporary minor illness, such as a common cold.

Reference: PAR-Q Validation Report, British Columbia Ministry of Health, 1978.

APPENDIX H: Telephone Questionnaire

TELEPHONE QUESTIONNAIRE

1. Were you aware that an exercise physiologist has been working at the Medical Clinic during the last half year?
2. If so, did you take advantage of any of the services offered by the exercise physiologist?
3. If no, why not?
4. If yes, how would you describe your experience with the exercise physiologist? Did you learn anything new?
5. Do you feel that as a result of your experience with the exercise physiologist you made any changes in your fitness or lifestyle habits? Please elaborate.
6. Do you feel that as a result of your experience with the exercise physiologist you made any changes in your attitude towards fitness and lifestyle? Please elaborate.
7. What physical activities have you been doing in the last three months?
8. Have you altered your eating, smoking or drinking habits in the last three months? If so, how?
9. Would you say you are more fit, less fit, or about the same compared with three months ago?
10. Have you had any major life changes in the last three months?
11. Do you think the exercise physiologist should remain associated with your medical clinic? Please elaborate.
12. Are there any additional comments you wish to make regarding the study?

APPENDIX I: Statistical Analysis

APPENDIX I

Analysis of the significance of the difference between two independent proportions

$$z = \frac{P_1 - P_2}{s_{P_1 - P_2}} = \frac{P_1 - P_2}{\sqrt{pq\left[(1/N_1) + (1/N_2)\right]}}$$

where: $$p = \frac{f_1 + f_2}{N_1 + N_2}$$

$$q = 1 - p$$

$$s_{P_1 - P_2} = \sqrt{pq(1/N_1 - 1/N_2)}$$

From: Statistical Analysis in Psychology and Education by George Ferguson

APPENDIX J: Estimated Office Expenses

FITNESS TESTING

Scenario #1

Cost: $315/month

Includes:

10' x 10' room (you provide fitness equipment, furniture)

Receptionist 08:30 - 17:00 hr (make appointments, checks in clients)

Central waiting room and washrooms

Free parking

Cleaning provided

Copying: pay as you go

Scenario #2

Cost: $1,135/month

Includes:

10' x 10' room in a professional building (you provide furnishings)

Telephone answering service (make appointments)

Beeper

Central washrooms

No waiting area

No cleaning services

Scenario #3

Cost: $2,740/month

Includes:

Two 10' x 10' rooms: receptionist/waiting room and testing room in professional building

- Half-time receptionist
- Telephone and book listing
- Utilities
- Central washrooms
- Free parking
- No cleaning services

APPENDIX K: Correspondence from Dr. Jeff Robinson

Coronation Medical Clinic

200-14310 111 Ave

Edmonton, Alberta

452-8091

January 31, 1985.

Dear Karen,

I am writing to relate some of the comments made by the physicians at the Coronation Medical Clinic regarding your research. I will also cover the feedback from the patients and my own suggestions.

Drs. Ausford, Gardener and Woodman all agreed that the experience was a positive one. They felt that this could be a valuable service to attempt to improve the physical activities of patients. In practice, the motivation provided by the counselling sessions with you was of considerable importance in changing the attitudes of patients.

Initially the doctors were not sure of the service you were providing, however, throughout the course of your time at the clinic this changed as evidenced by the increasing number of referrals at the end. We all would have liked more direct feedback regarding the patient assessments. As well there was some concern regarding the results and recommendations of the Health Hazard Appraisal. We already discussed the Pap Smear recommendations contradicting commonly accepted medical practice. This particular tool should be looked at more closely to see if the recommendations differ from most physicians advice to patients.

Retrospectively, we all felt we could have made more referrals and would do so in the future.

In general, the response from the patients was excellent. In particular they were in favor of the opportunity to be given well informed individual advice. It was mentioned that the counselling sessions gave them a realistic view of their fitness and what they had to do to improve it. They also felt that this format provided excellent motivation for change. Several patients commented on the appropriateness of having an exercise physiologist affiliated with a physicians office. The negative comments from patients related only to logistical problems. These included difficulties scheduling appointments, the location of testing and contacting you on short notice.

My own comments are consistent with those above and based on those I would make several recommendations for an exercise physiolgist undertaking a similar project in the future. These are listed below.

1. Give more extensive explanation directly to all the physicians involved in the referral process outlining the services provided to the patients. This should include the details of assessment and recommendations with examples.
2. Provide written direct feedback to the patients attending physician in the form of a report outlining the findings of the assessment and the recommendations made to the patient. This would allow the doctor to follow and reinforce the patients progress.
3. Have an easily accessable and central location for referral with well delineated hours.
4. Affiliate with other health care professionals including a dietician.

In summary it appears that the involvement of an exercise physiologist in a family clinic setting was positive from the physicians viewpoint and, at least subjectively, it was of benefit to the patients.

Yours sincerely,

J.M: Robinson, M.D.; C.C.F.P.

APPENDIX L: Correspondence from Dr. John Mackel

Misericordia Family Clinic

February 1, 1985

Re: Exercise Physiologist in the Family Clinic

The Exercise Physiologist, Ms. Karen Smith, was available to the patients and staff of the Misericordia Family Clinic for approximately a six month period. The purpose of this project was to determine if there was a need for the type of services offered by an exercise physiologist in a primary care setting. Services offered included advice and fitness testing. Questionnaires were distributed both by the exercise physiologist and members of the staff of the clinic. Fitness testing equipment was available within the hospital complex so that patients could be tested by appointment.

The programme appeard to be well received by all concerned. A few patients declined on the basis of age and/or pre-existing disease. Some felt they were too busy and did not have the time to fill out what they perceived as a rather long and involved questionnaire, and some were not interested. These seemed to be in a minority. An explanation of the purpose of the project was generally followed by an expression of interest and enthusiasm by most patients. Certain sub-groups were particularly interested, e.g. pregnant patients.

The only improvement I could suggest would involve a critical look at the questionnaire in order to shorten the time required to complete it. In addition, some of the questions, particularly the first 1 -2 pages, were, on first examination, difficult to answer. These criticisms, of course, are only minor, and any shortening of the questionnaire would likely

produce less information for the investigator.

Generally speaking, it is my opinion that the presence of an exercise physiologist was beneficial to patient care. If such a function is to be incorporated into a general practice setting, some attempt to produce budgetary information would need to be included in the study.

Yours truly,

J.V. Mackel, M.B., C.C.F.P.

Director, Misericordia Family Medicine Programme

APPENDIX M: Correspondence from Dr. E.H. Krikke

Misericordia Family Clinic

January 18, 1985

Dear Karen:

Thank you very much for the copy of the results of an adapted test on Genice Kuhn. Thank you for arranging to see her again in four months from the first visit.

During your project involving the Misericordia Family Clinic I greatly appreciated the opportunity to refer patients to you for assessment and advice in fitness and exercise matters. I aslo picked up a few pointers from your presentation to the medical staff.

Wishing you all the best of success in your present and future endeavours.

Yours truly,

E.H. Krikke, M.D.