INITIATING WALKING AS A REGULAR PHYSICAL ACTIVITY FOR SEDENTARY ADULTS: A PROTOCOL AND TOOLS FOR PRIMARY CARE PROVIDERS

A Scholarly Project for the Degree of MSN

MICHIGAN STATE UNIVERSITY

ROBERT JOHN ZIOLA

1999

INITIATING WALKING AS A REGULAR PHYSICAL ACTIVITY FOR SEDENTARY ADULTS: A PROTOCOL AND TOOLS FOR PRIMARY CARE PROVIDERS

By

Robert John Ziola

A Scholarly Project

Submitted to

Michigan State University

In partial fulfillment of the requirements

For the degree of

Master of Science in Nursing

1999

Abstract

INITIATING WALKING AS A REGULAR PHYSICAL ACTIVITY FOR SEDENTARY ADULTS: A PROTOCOL AND TOOLS FOR PRIMARY CARE PROVIDERS

By
Robert John Ziola

Despite the known benefits of regular physical activity and the risks associated with sedentary lifestyles, more than 60 percent of American adults do not engage in the suggested amounts of regular physical activity necessary to prevent chronic health problems and improve health. Compounding this image of the sedentary American is data indicating that only 30 percent of primary care providers counsel their inactive clients.

Primary care providers, including the Advanced Practice Nurse (APN), can positively impact the health of individuals, families and communities by integrating walking information and routine physical activity assessments into their practices. This project 1) examined research, theories, interventions, and strategies in the literature related to regular physical activity; 2) developed a walking protocol and assessment tool for primary care providers to use with low-risk sedentary adults 20-50 years of age; 3) developed a brochure to stimulate interest in, and information about, walking for those interested in increasing their physical activity; and 4) developed tools for the client to use to increase the chances of increasing physical activity through regular walking.

I would like to dedicate this project to

my loving wife Mary, my dear 4 year-old son Anthony, and

my dear six month-old daughter Elizabeth.

They supported me in the completion of this project and in meeting the many demands

of graduate school.

ACKNOWLEDGEMENTS

Many thanks to my committee members – George Allen (chair),
Linda Spence, and Sue Wheeler. Their assistance, direction, and support
aided me in the completion of this project.

Thanks also to Michigan State University College of Nursing
faculty and staff – Sandy Altenritter, Sharon Graver, Millie Omar, and Brigid Warren –
and clinical preceptors Linda Speegle MD and Maureen Street MD.
They provided valuable time, assistance,
learning experiences, and a nurturing environment in which to work.

Table of Contents

List of Figures

Introduction

There is ample evidence in the literature demonstrating the physiological and psychological benefits of regular physical activity (Blair et al, 1996; Berlin & Colditz, 1990; Butler et al, 1998; Kushi et al, 1997; McAuley et al, 1997; Paffenbarger et al, 1993; Steinberg et al, 1997). According to the Surgeon General's Report on Physical Activity and Health (USDHHS, 1996), regular physical activity is associated with lower mortality rates for younger and older adults, decreased risks of colon cancer, Type 2 diabetes, and cardiovascular disease mortality. Regular physical activity is also linked to maintaining healthy bones, muscles and joints, controlling weight, building lean muscle, reducing fat, preventing or delaying high blood pressure, improving functioning in persons compromised by poor health, improving mood, and, for some, relieving symptoms of depression and anxiety and enhancing well-being.

Healthy People 2000 (USDHHS, 1990), a national consortium of over 300 local, state and national organizations whose goal is to achieve improved health for all Americans, has recognized the importance of regular physical activity and has included it in their goals. Many of the objectives specifically address increasing regular physical activity among adolescents, adults, and high risk populations in an effort to decrease the number of people who engage in no leisure-time activity and the health risks associated with inactivity.

There is an international consensus regarding the significance of physical activity for preventing and controlling coronary heart disease (CHD) and other preventable chronic and emotional conditions (Bouchard, Shephard & Stephens, 1994). Lost productivity, health expenses, absenteeism, job-related strain, and anxiety due to the lack of physical activity are concerns for many employers.

There is also growing recognition of the need to increase regular physical activity among Americans in hopes of reducing costs associated with cardiovascular disease, diabetes, hypertension, obesity, colon cancer, and arthritis (Hatziandreu, Koplan, Weinstein, Caspersen & Warner, 1988; USDHHS, 1990). For example, it is estimated that two to four million Americans have congestive heart failure (CHF), a disease of high mortality which is correlated with increasing age. CHF accounts for over 500,000 hospital admissions per year (Ghali, 1992). As the "baby boomers" age and the geriatric population increases, there is a concern that CHF will increase the cost to the healthcare system and account for increased morbidity and hospitalizations.

The Problem

Despite what is known about the benefits of regular physical activity and the risks associated with sedentary lifestyles, more than 60 percent of American adults do not engage in the suggested amounts of regular activity (Caspersen et al, 1994). Approximately 15 percent of U.S. adults participate in regular vigorous physical activity. Less than 10 percent of U.S. adults exercise three or more times a week at an intensity that will improve cardiorespiratory fitness (USDHHS, 1990). Approximately 25 percent of U.S. adults are not active at all (USDHHS, 1996). In a national cross-sectional study of over 16,000 women and over 10,000 men, Jones et al (1998) found that only one third of U.S. adults engaged in moderate activities that met the recommendations of the 1993 Centers For Disease Control and Prevention (CDC), the American College of Sports Medicine (ACSM), or the 1996 SGR on Physical Activity and Health guidelines.

A similar trend is seen among adolescents and young adults. Among high school students, daily enrollment in physical education classes dropped from 42 percent to 25 percent between 1991 and 1995. Almost 50 percent of those 12-21 are not vigorously active on a regular basis; and physical

activity of any kind drops dramatically as age or grade in school increases (USDHHS, 1996). DeMarco & Sidney (1989) found that, given a choice, children often elect not to take physical education classes, and those who do engage in physical education classes fail to show any fitness gains due to lack of duration and intensity. This findings is disturbing when evidence suggests that participation in physical activity early in life may be linked to physical activity later in life (Barnelow-Bergkvist et al, 1996; Telama et al, 1996).

Purpose

The purposes of this scholarly project are: 1) to examine the research, theories, interventions, and strategies in the literature that relate to regular physical activities; 2) to provide an informational brochure that identifies strategies that have been shown to be effective for adults and encourages the client to consult with his/her primary care provider; 3) to develop an assessment tool for primary care providers that will provide information about the client who is interested in walking; and 4) to develop a protocol that promotes walking as a means of regular physical activity for low-risk sedentary adults 20-50 years of age and that increases the likelihood of successful goal obtainment.

Following available theoretical and research-based knowledge, and educational brochure and aids for clients and a protocol and assessment tool for providers were developed to support physical activity among sedentary adults 20 to 50 years of age who are contemplating or preparing to increase their physical activity by walking. This client age range was chosen due to 1) the sudden drop in physical activity that is seen after high school and which is maintained through middle adulthood, and 2) the relatively stable musculoskeletal and socio-economic health of adults in this age range. The target population excludes those with acute myocardial infarction or respiratory difficulty or clients

with class III or IV CHF. The exclusion of these groups is based on the risks associated with such groups and the inability to safely monitor changes in such groups in a primary care setting.

This project was undertaken because of the many positive aspects of walking as a regular physical activity. In addition to its positive impact on health, walking is a convenient form of exercise (Pate et al, 1997; USDHHS, 1996). As a health activity, walking is associated with relatively low risks (Panush, 1994; Swan & Seedhom, 1993; Thompson et al, 1982). There are higher compliance rates with moderate physical activities such as walking (Duncan et al, 1991; King et al, 1991; USDHHS, 1996). And there is a need to provide simple, useful and specific strategies to support regular physical activity.

Primary care providers are not meeting all of the health needs of their sedentary clients. According to The Report of the U.S. Preventive Services Task Force (USDHHS, 1998), only about 30 percent of primary care clinicians provide counseling to their inactive clients. In a midcourse review of their goals, *Healthy People 2000* (USDHHS, 1995) found that internists inquired about the exercise habits of 40 percent of their clients and formulated exercise plans for 25 percent; nurse practitioners (NP's) routinely inquired about the exercise habits of 30 percent of their clients and formulated exercise plans for 14 percent; lower percentages were found among family practitioners, pediatricians, and obstetricians and gynecologists. Though exercise is an essential part of diabetes management, Krug et al (1991) found that only 25 percent of Type 2 diabetics reported receiving specific guidelines for exercise.

This lack of activity assessment and specific exercise planning and support is important for the Advanced Practice Nurse (APN) and the client. The APN's focus has long included education and practice in health promotion and disease prevention based on education, theory, research, and

evidence with demonstrated outcomes (American Nurses Association, 1994). For the APN, a protocol and an assessment tool that is based on sound theory and research and that employs simple successful strategies for supporting regular physical activity such as walking may increase the number of clients reached, the success of those reached, and the health of the client, the family and the community in which they reside. For the client, educational materials and tools that increase information about regular physical activity, that are easy to understand and use, that address a wide spectrum of client profiles with unique qualities, circumstances, strengths, and resources, and that provide support and direction increase the chances for client compliance and success (King, 1992). Such educational materials and tools support client self-care and self-efficacy.

REVIEW OF LITERATURE

Physical Activity

Physical activity is broadly defined in the literature and can cover a broad range of activities from washing a car, gardening, raking leaves, and walking to basketball, running, and football. This broad use of the term physical activity complicates comparing research findings and necessitates a more precise definition. In 1985, Caspersen et al. defined physical activity as any skeletal activity that results in energy expenditure. Within Caspersen's definition, any activity – aerobic or resistance training – that involves skeletal muscles and burns calories is physical activity. This definition, though more restricted, does not address the intent of many research studies on physical activity.

The CDC, the ACSM, and the SGR (USDHHS, 1996) developed evidence-based parameters for the concept of physical activity. Regarded as authorities in physical health and activity, they have provided recommendations, based on the evidence thus far, on the amount and the intensity of physical activity necessary to obtain cardiorespiratory benefits. In 1993, the CDC and the ACSM

recommended that every U.S. adult should accumulate 30 or more minutes of "moderate-intensity activity on most, preferably all, days of the week" (Pate et al, 1995). Moderate-intensity activity is defined as an activity that is performed at an intensity of 3 to 6 metabolic equivalents (METs). This would include such activities as aerobic dance, brisk walking or gardening. In 1996, however, the SGR redefined beneficial physical activity. Instead of a variety of "target heart rates" for 20-30 minutes 3-7 days per week, the SGR now maintains that minimum cardiorespiratory changes can be achieved in sessions as small as 10 continuous minutes, three times per day. The amount of physical activity required for cardiorespiratory benefit is a function of duration, intensity and frequency of activity. Based on its findings, the SGR developed two categories of physical activity. The new categories are named "activity for health" and "activity for fitness."

"Activity for health" is defined as 30 minutes of physical activity of moderate intensity (or less than 60 percent of maximum heart rate for age) 5-7 days per week with the stipulation that only sessions of 10 or more continuous minutes are counted. Maximum heart rate for age equals 220 beats per minute minus age. Moderate physical activity is equivalent to an activity of sufficient duration to expend 150 calories per day or 1000 calories per week, and the activities may vary per day or week. It requires "sustained, rhythmic muscular movements, is at least equivalent to walking," and is performed at less than 60 percent of maximum heart rate for age (USDHHS, 1996). However, because the amount of physical activity required for cardiorespiratory benefit is a function of duration, intensity and frequency, the same benefit can be obtained in longer sessions of moderately intense activities such as brisk walking as in shorter sessions of more intense activities such as running. Thus, examples of moderate amounts of physical activity would include stair walking for 15 minutes,

shoveling snow for 15 minutes, walking two miles in 30 minutes, wheeling self in wheelchair for 30 – 40 minutes, and washing or waxing a car for 45 – 60 minutes (SGR, 1996).

Another way to understand the relationship between physical activity duration and intensity is this: the greater the intensity of the sustained effort of activity, the less time is necessary to receive cardiorespiratory benefit. Likewise, the less vigorous the sustained activity, the more time is needed to obtain cardiorespiratory benefit. Appendix C reflects the variation in activities which meet the definition of activity for health. I have named them health activity equivalents (HAE's) or activity substitutes to reflect the relationships between various daily activities and those activities that meet the minimum requirements to obtain cardiorespiratory benefit. This range of physical activity allows the primary care provider to better individualize recommendations for clients and draws upon a broader range of activities that can be performed at home, at work, or within a structured environment.

"Activity for fitness" is defined as 20 minutes or more of vigorous activity (e.g. running, swimming, or greater than 60% maximum heart rate for age) 3-5 days per week. Activity for fitness requires rhythmic repetitive activities that use large muscle groups at 60% or more of maximum heart rate for age (USDHHS, 1996). As was the case with activity for health, because the amount of physical activity required for cardiorespiratory benefit is a function of duration, intensity and frequency, the same benefit can be obtained in longer sessions of less vigorous activities as in shorter sessions of more vigorous activities.

In addition to cardiorespiratory activity guidelines, the SGR (USDHHS, 1996) recommends muscle strength development two or more times per week to decrease the risk of falls. This may have the greatest impact on the elderly who, with increased musculoskeletal conditioning, may improve their ability to live independently.

Regardless of how physical activity is measured, it is clear that the benefits that accompany physical activity are sustained only if the individual maintains appropriate physical activity over the long term (Pafffenbarger et al, 1984; SGR, 1996). Many of the beneficial effects of physical activity diminish within 2 weeks if the activity is substantially reduced, and effects disappear within 2-8 months if physical activity is not resumed.

Except for deterring osteoporosis in premenopausal and postmenopausal women and reducing the risk of hip fractures postmenopausal women, physical activity cannot be performed occasionally to obtain physiological benefits (Magnus et al, 1979). In a population-base case-control study of over 1500 postmenopausal women with hip fracture, Jaglal et al (1993) showed independent protective effects of past physical activity and moderate levels of recent physical activity on the risk of hip fracture. Dalsky et al (1988) found that weight-bearing exercise deterred lumbar spine bone loss in postmenopausal women. Unlike the relationship of physical activity to osteoporosis and risk of hip fractures, an individual cannot expect protection from CHD for having exercised regularly in the past (Paffenbarger et al, 1984). It does, however, appear that beginning moderately vigorous physical activity in adulthood may reduce the risk of CHD for those who have been physically inactive for many years (Paffebarger et al, 1993).

Unfortunately, many studies have shown that up to 50 percent of the individuals who begin an exercise program stop within the first six months (Blair 1988; Kriska et al.1986; Leith, 1992). Similar adherence results have been found with children (Epstein et al., 1984). The SGR (USDHHS, 1996) found that though many people embarked on vigorous exercise programs, most did not maintain their participation. Though regular vigorous physical activity is likely to be most beneficial, moderate physical activity has higher compliance rates, is more adaptable to various lifestyles, and is maintained

better over time (Blair et al 1989; Duncan et al, 1991; King et al, 1991; USDHHS, 1998). These studies suggest that efforts to increase regular physical activity focus on moderate physical activities such as walking.

Determinants

A number of variables have been positively linked to physical activity. Dishman (1994) found that physical activity habits are positively correlated with higher education, increased income, male gender, and non-Hispanic white race. Physical activity in childhood correlates with future activity (Barnekow-Bergkvist, 1996; Telama, 1996). Perceived benefits (Muto et al, 1996), perceived enjoyment (SGR, 1996) and social influences (i.e. support from family and friends) specific to exercise are positively correlated with physical activity participation (Bungum & Vincent, 1997; Dishman, 1994; Oka et al, 1995; SGR, 1996). Perceived convenience of the activity setting and its proximity to the home or workplace have also been shown to be positively correlated with physical activity adherence (Andrew et al, 1981; Tsai et al, 1987). There is also growing evidence to suggest that those who are physically active prefer to engage in activities outside of formal programs (King et al, 1990; Shephard, 1988).

Benefits

The physiological effects of physical activity include its ability to decrease fat mass, increase high-density lipoprotein cholesterol, and decrease triglycerides and total cholesterol (Paffenbarger et al, 1993; Schuler et al, 1992). These positive physiological effects of regular physical activity are involved in the prevention and/or control of cancers, hypertension, cardiovascular disease, CHF, and Type 2 diabetes.

Physically active people are less likely to die from CHD. In a meta-analysis of primary prevention of CHD, Berlin & Colditz (1990) found that the relative risk of death from CHD was 1.9 times greater for sedentary people as compared to the physically active. In a prospective cohort study over 7 years among 40,417 postmenopausal women, Kushi et al. (1997) found an inverse relationship between physical activity and all-cause mortality. After excluding such confounding variables such as cancer and heart disease, women who reported regular physical activity were at significantly reduced risk of death compared with women who did not (relative risk 0.77; 95% confidence interval [CI] 0.66-0.90). In a prospective study of men 40-59 over 15 years, Wannamethee et al. (1998) found that maintaining or initiating light or moderate physical activity reduced mortality and heart attacks in older men with or without diagnosed cardiovascular disease. Relative risks for the groups who reported light or moderate activity were 0.61(95% CI 0.48-0.86) and 0.50 (95% CI 0.31-0.79), respectively.

Evidence suggests that physically fit adults live 2 to 3 years longer and have a better quality of life than sedentary individuals (Blair et al, 1996; Butler et al, 1998). In addition, in a 9-year longitudinal study of elderly runners and non-exercisers, Fries et al. (1994) found that musculoskeletal pain and stiffness were 25 percent lower in the exercisers than in the non-exercisers. Fries et al. also reported that no total joint replacements were performed on the group that exercised and over the course of the study, the initial disability at age 68 (.026 for runners vs. .077 for non-exercisers; $p < .001$) widened to .06 for runners and .23 for non-exercisers ($p < .001$).

In a review of 21 studies that examined the relationship of physical activity to breast cancer, Friedenreich et al (1998) found that 15 of 21 studies suggested that physical activity reduces the risk of breast cancer, four studies found no association between physical activity and risk of breast cancer,

and two studies found an increased risk of breast cancer associated with physical activity. Overall, the evidence appeared to support an inverse relationship between risk of breast cancer and physical activity.

Many studies have linked physical activity to psychological changes or perceptions. These non-physiological elements have included enhanced mood and creative thinking (Steinberg et al. 1997), self-esteem (McAuley et al., 1997; Muto et al, 1996), and self-efficacy (Fontaine & Shaw, 1995; McAuley, 1995 & 1993; Sallis et al, 1992; SGR, 1996). Other qualities associated with increased physical activity include perceived romantic appeal, self-worth, and athletic competency (Douthitt, 1994), physical appearance and attraction (Douthitt, 1994: McAuley et al, 1993), and decreased anxiety (McAuley et al, 1995).

Barriers

The most common obstacles for participation in physical activity include perceived lack of time (Hurrell, RM, 1997; Marcus, 1992) and lack of convenience (Andrew et al, 1981). Other common obstacles for engaging in physical activity identified in the literature include lack of support from family and friends and confidence in one's ability to engage in regular physical activity (Pate et al, 1997; SGR, 1996), confidence in the value of physical activity (Andrew et al, 1981; Dishman, 1991), perceived barriers (Muto et al, 1996), and increased age (Dishman, 1994).

Complementing these reports are findings that physical inactivity is greatest among women, Blacks, Hispanics, older adults, and the less affluent (SGR, 1996; Jones et al, 1998). Physical inactivity is a significant risk factor for the disabled or physically impaired (SGR, 1996). Such are the risks associated with these groups that *Healthy 2000* (USDHHS, 1990) has targeted specific goals and resources to reduce their risks.

Sallis and Owen (1997) believe that modern society has created an environment that encourages sedentary lifestyles. They suggest that modern transportation, passive entertainment such as television, movies, and computer games, and labor saving technology at home and at work promote inactivity. This perspective may be useful in understanding an individual's barriers and lack of motivation for change.

Risks

There may be risks associated with physical activity, including musculoskeletal injury, osteoarthritis, myocardial infarct, changes in menstrual function, fractures, and, rarely, sudden death. The risk of sudden death is increased during vigorous physical activity (Thompson et al, 1982). However it is the sedentary individual who initiates vigorous activity that is at greater risk of sudden death (Siscovick et al, 1984; Kohl et al, 1992). Most of the remaining risks are preventable and are often the result of sudden significant increases in physical activity, excessive levels of physical activity, and/or improper technique (USDHHS, 1998). Comfortable moderate physical activity that puts joints through normal range of motion does not – in the absence of joint abnormality – inevitably lead to injury (Panush, 1994). Graduated physical activity that allows cartilage to adapt is less likely to induce osteoarthritis (Swan & Seedhom, 1993).

THEORETICAL FOUNDATION

Several theories are popular in the literature and have been used as the basis for strategies and interventions to initiate and maintain regular physical activity. The most common of these are based on operant conditioning (Nemeroff & Karoly, 1991), social learning theory (Bandura, 1977), the Transtheoretical Model (Prochaska, 1983), and the Health Belief Model (Rosenstock, 1974).

Operant conditioning is based on the theory that behaviors are learned through a process of positive and/or negative reinforcements and self-management techniques (Skinner, 1953). That is, the presentation of a positive reinforcement or the removal of a negative reinforcement increases the likelihood of a behavior. Initially, reinforcements must be timely, frequent, and of significance to the individual. This feedback is particularly important with physical activity or exercise in which the immediate consequences can be negative (e.g. feeling hot, sweaty, and/or fatigued) while the rewards of physical activity or exercise may be delayed (e.g. weight loss, improved blood pressure, improved mood).

Strategies such as written contracts which specify the contingencies surrounding the behavior, and stimulus control methods which employ cues like visual or spoken reminders for initiating physical activity, have been used to increase exercise adherence (Brownell et al, 1980; Epstein & Wing, 1980; Neale et al, 1990). Logs used to self-monitor the behavior facilitate shaping (the gradual acquisition of goals over time), identify the risk of relapse, and prevent over-exercising (Juneau et al, 1987). Even the statement of the intent to change exercise behaviors has been shown to increase physical activity (Huddy et al, 1995). However, for long-term maintenance of a behavior it is important that control shift to self-regulation and that extrinsic reinforcers change to more intrinsic reinforcers such as self-efficacy, sense of well-being or improved mood (Marcus, et al, 1996).

Social learning theory is based on the belief that behavior, the environment, and personal factors interact to determine behavior (Bandura, 1977). This theory also stresses the importance of 1) an individual's sense of self-efficacy and ability to control behavior, 2) the belief that behavior is motivated by some meaningful reinforcement, and 3) that changes in the individual and/or the environment can produce the potential for behavioral change. Attainment of goals by vicarious experience, small goal attainment, or support from others leads to a sense of self-efficacy, which can then act as motivation for behavior change.

Strategies based on social learning theory have successfully used various techniques to produce behavior change. Wankel (1984) found that decisional balance sheets - a comparison of the perceived costs and benefits of exercise participation – increased physical activity involvement among participants in a university fitness program, a commercial fitness center, and a community-based fitness class. Wankel also found that social support, such as an activity "buddy," attendance charts, and family support, was also linked to increased physical activity participation in an exercise class. Relapse prevention training – cognitively and behaviorally learning to prevent and/or cope with relapses back to undesirable behaviors – was successfully used by employees within a large national corporation to increase physical activity (King et al, 1988). Marcus & Stanton (1994) attributed relapse prevention training and reinforcement to increased short-term attendance among overweight female university employees. Stimulus control strategies i.e., manipulation of events or the environment which act as cues for physical activity, were employed by Brownell et al. (1980) to increase stair climbing behavior and by Keefe & Blumenthal (1980) to increase walking and jogging adherence in overweight males.

The Transtheoretical Model (TTM) or stages of change model, suggests that an individual's current behaviors and readiness to maintain or change their behavior influence the likelihood of change (Prochaska et al, 1997). The five stages of the TTM are: 1) precontemplation - there is no intention to take action in the next 6 months; 2) contemplation – one intends to take action in the next 6 months; 3) preparation – one intends to take action in the next 30 days and has taken some steps in that direction; 4) action – one has changed one's overt behavior in the last 6 months; and 5) maintenance – one has changed one's overt behavior for more than 6 months. The TTM suggests that cognitive processes such as consciousness raising, dramatic relief, and self-evaluation are used more in early stages and that behavioral processes such as stimulus control, counter-conditioning, and helping relationships are used more often in later stages to change behaviors. Movement through these stages is not always linear but may be cyclical or the individual may make several attempts at behavior change before their goals are accomplished. Interventions based on the TTM match treatments with an individual's stage of readiness. For example, treatment of an individual in the precontemplation stage of exercise would focus on cognitive processes, whereas treatment of individuals in the action stage would focus on such behavior processes as reinforcement, stimulus control, and helping relationships.

Studies have shown that the TTM works well with smoking cessation programs with adults (Prochaska et al, 1993), and sexual behavior change (Grimley et al, 1993; Grimley et al, 1995). The TTM's usefulness in maintaining physical activity is promising but less abundantly documented. Using construct interventions specifically related to stage-matched participants, Marcus et al (1992) were able to increase adoption of physical activity among 610 community volunteers. In a study using the TTM with interventions on 349 cardiac rehabilitation participants, Hellman (1997) also found an

increase in exercise behaviors and movement through the stages. The TTM provides a model that uses the concepts of other models (e.g., cognition, behavior, and self-efficacy) but is more dynamic, provides choices, and is adaptable to the variety of client profiles and needs.

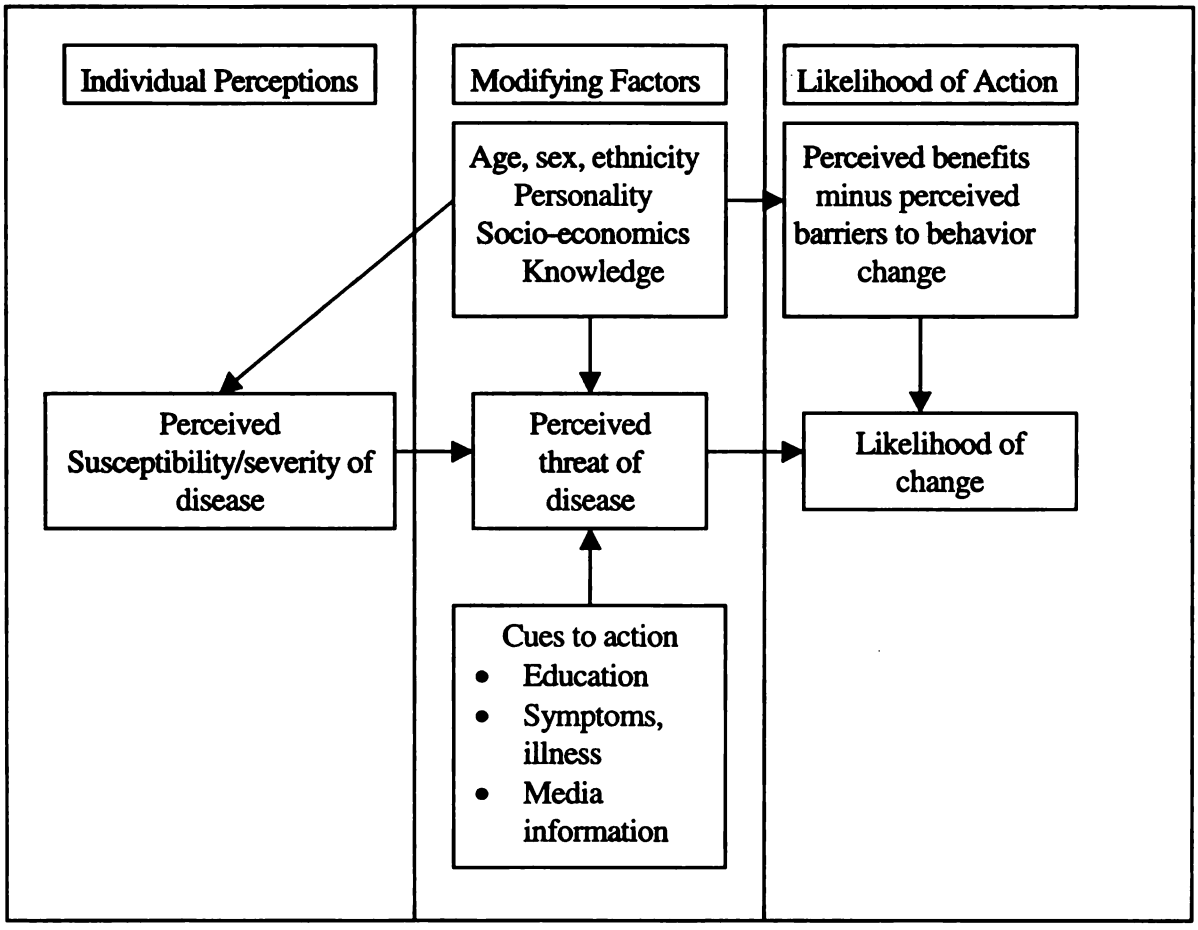
The Health Belief Model is a theory based on value expectancy (Rosenstock, 1974), that is, the individual 1) identifies a perceived susceptibility to and/or severity of illness, 2) uses modifying factors such as knowledge, education, symptoms, experience, and socioeconomic factors, to 3) determine the perceived threat of disease or illness, and then 4) weighs the perceived benefits and barriers to behavior change. This process impacts the likelihood of behavior change (Strecher & Rosenstock, 1997). Although the HBM was originally used to explain preventive health behaviors such as immunizations, it has also been used to explain other preventive behaviors. In a 15 year prospective study of 1032 men and 1394 women, Ferrini et al.(1994) found that individuals who agreed with the belief that diet and exercise were important health factors and who were willing to spend money on their health were more likely to make positive changes in their diet and activity behaviors.

Because this project focuses on individuals who are ready to increase physical activity, the Health Belief Model (Figure 1) was chosen as the basis for developing the tools and protocol of this project.

Conceptual Definitions of the Health Belief Model

As may be seen in Figure 1, the HBM has three major constructs: "individual perceptions" "modifying factors" and "likelihood of action." Individual perceptions include perceived susceptibility/severity of disease. Modifying factors include demographic and socio-psychological variables and perceived threat. Likelihood of action includes perceived benefits minus perceived

Figure 1. THE ROSENSTOCK HEALTH BELIEF MODEL COMPONENTS AND LINKAGES



In: Glanz, K., Lewis, F.M., & Rimer, B.K. (Eds). 1997. Health Behavior and Health Education. 2nd Edition. San Francisco: Jossey-Bass Publishers

barriers to behavior change and likelihood of behavior change. The interactions of these constructs determines the readiness of an individual to take action and the probability of behavior change.

Perceived susceptibility is the individual's subjective perception of his/her risk or vulnerability of contracting an illness or disease. This perception may or may not be correct.

Perceived severity is the individual's subjective interpretation of the seriousness of an illness or disease, if the individual is susceptible. Like perceived susceptibility, it may or may not be accurate. The individual's perceived susceptibility and perceived severity of illness or disease would reflect an individual's perceived threat of an illness. Because of their strong cognitive component, perceived susceptibility and severity are dependent, in part, on knowledge (Rosenstock, 1974).

Demographic and socio-psychological variables, such as age, gender, ethnicity, personality, income, and knowledge, may indirectly influence behavior change. For example, lack of education or lack of access to useful information may influence one's ability to accurately gage one's susceptibility, severity, or threat of illness or the benefits or barriers to behavior change.

Cues to action are those triggers that prompt an individual to consider or to begin to initiate behavior change. Cues include educational and/or media information and signs and symptoms of illness. They may also include the death of a friend or advice from a friend.

Perceived benefits refers to the individual's belief that a behavior such as increasing physical activity will reduce the severity or susceptibility of disease or illness or will provide other perceived personal benefits. For example, engaging in a regular physical activity like walking may not only prevent hypertension but may have the added benefit of increasing one's sense of well-being.

Perceived barriers are those perceived impediments to undertaking an activity or activities that would reduce the risk or severity of a perceived illness or health condition. Such perceived barriers would include lack of time, lack of convenience and lack of self-efficacy.

Self-efficacy is the belief that one can actually perform the behavior necessary to produce the desired outcome or goal. It is not identified in the model but plays an important role in determining outcomes (Bandura, 1977).

Application of the HBM to Sedentary Adults

Application of the HBM to sedentary adults who are ready to in increase their physical activity by walking does not focus on the motivation of, or many of the modifying factors of the individual. Instead, it focuses on providing cues to action in the form of educational information, which is accurate, easily understood, safe, evidence-based, and specific to increasing physical activity by walking (Figure 2).

Given the readiness of the population identified to initiate increased physical activity by walking, perceived susceptibility/severity of disease would be limited to briefly informing the. individual about some of the health risks and health benefits of physical activity such as decreasing the risk of heart disease, controlling and/or reducing weight, reducing or preventing hypertension, and relieving symptoms of anxiety and depression.

Given the interest in walking and the relatively low-risk status of the target population, it is assumed that the perceived threat of disease is present to the individual. Since the threat is determined by the interaction of other variables in the model, any new information provided by individual perceptions or modifying factors will influence or confirm perceived threat of disease.

Figure 2. ADAPTED HEALTH BELIEF MODEL

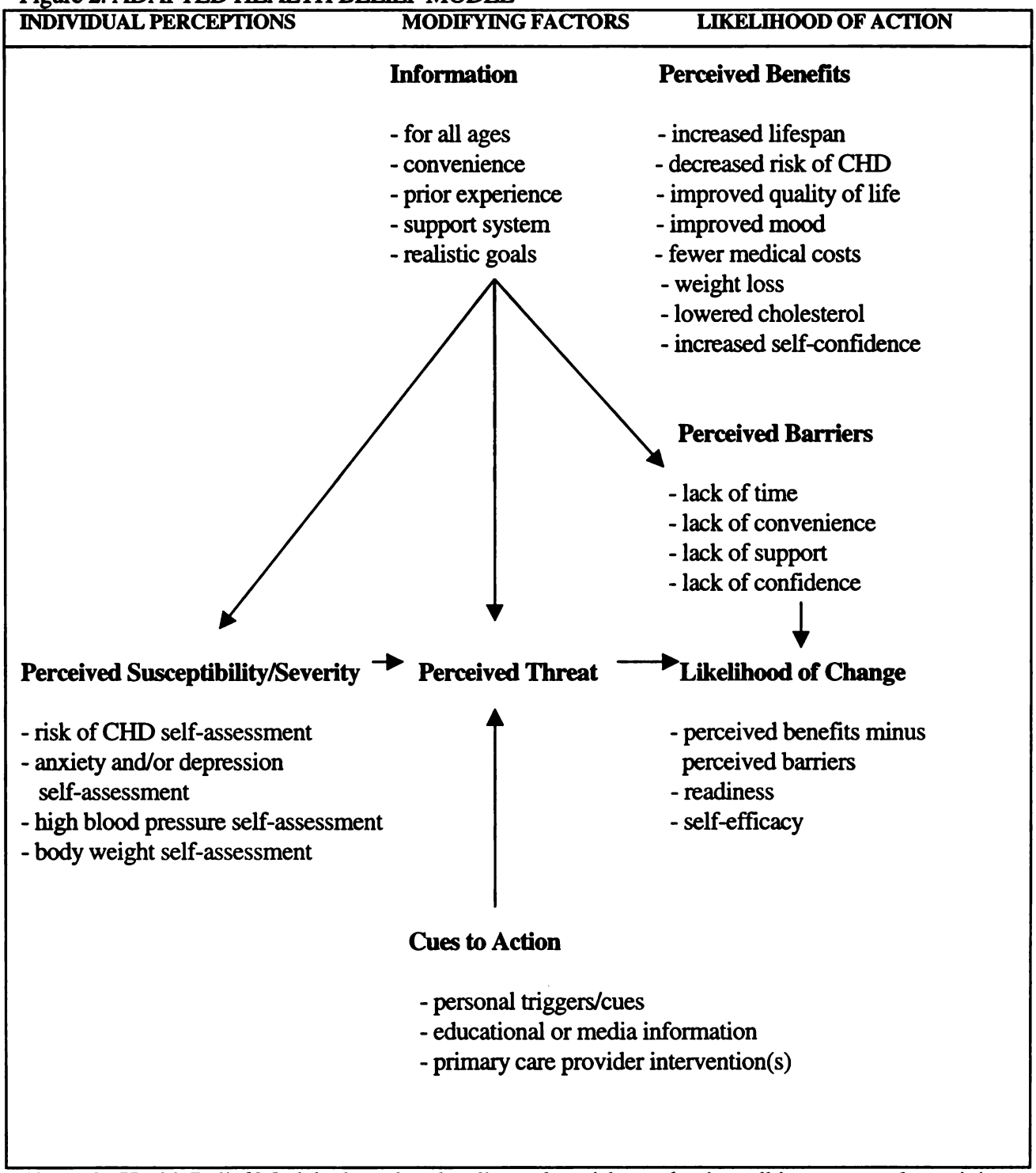


Figure 2. Health Belief Model adapted to the client who wishes to begin walking as a regular activity. August, 1999; Robert J. Ziola.

Within the context of modifying factors, information is provided to increase knowledge and assist individuals in meeting their goals. Knowledge gained from prior experience and success at an activity, convenience such as proximity to home or work, and support from family and friends may reinforce or support their decision to begin physical activity. To reduce the risks associated with increasing physical activity, directions about consulting with a health care provider about the plan to increase physical activity will be included in the model.

Perceived benefits focus on findings in the literature regarding the benefits of increased physical activity, including possibly increasing one's life span and quality of life, decreased medical costs and musculoskeletal pain, weight loss, improved mood and cholesterol levels, decreasing the risk of CHD, and improved self-confidence.

Perceived barriers include those barriers found in the literature and strategies used to reduce or overcome barriers. Such strategies would include writing specific goals, telling family, friends or coworkers of those goals, finding a partner with whom to exercise, setting a date to begin, using the stairs at work, providing an activity schedule to increase walking, and substituting comparable activities when the planned activity is not feasible. The Walking Questionnaire (Appendix B) will be used to assess barriers and, with both client's and provider's involvement, will be used to identify strategies to overcome those barriers.

By clarifying misconceptions, providing accurate information, strategies to overcome barriers, support, and useful tools for the client, the likelihood of behavior change (i.e., walking for exercise) will be increased. Use of the HBM in conjunction with a protocol, tools for supporting change, and successful strategies for increasing physical activity can provide the client with more resources to

increase walking and provide the primary care provider with more tools to provide primary care services.

Conclusions

Physical activity is a modifiable factor that can impact an individual's relative risk for many chronic diseases. Lack of regular physical activity contributes to many preventable diseases. Many factors, including past history of physical activity, perceptions, self-confidence, resources, fears and risk status come into play in determining the degree of physical activity maintained. Maximizing the effectiveness of interventions to maintain or increase physical activity necessitates an understanding of the findings in the literature, the recommendations of experts in the field, and the theories and interventions which have shown promise. It is likely that multiple levels of intervention derived from various theoretical frameworks need be employed to succeed at enhancing individual and public levels of physical activity (Marcus et al, 1992; Prochaska et al, 1997).

The SGR (USDHHS, 1996) states that individuals of all ages can benefit from physical activity and recommends that sedentary individuals increase physical activity in daily habits (e.g., mall walking, gardening, washing the car by hand, begin physical activity of short duration and moderate intensity, and gradually increase the duration and/or the intensity until a goal is reached thereby increasing the likelihood of success and helping to avoid musculoskeletal injuries. Men over 40, women over 50, individuals with chronic illnesses, and those at high risk (e.g., cardiovascular disease) should consult with a health care provider before initiating new physical activity regimes.

The Report of the U.S. Preventive Task Force (USDHHS, 1998) recommends short-term goals for the sedentary that are a small increase over current levels. Over several months these individuals can progress to a level of physical activity that provides cardiorespiratory benefits.

Sporadic, vigorous physical activity is discouraged in the sedentary in favor of consistent moderate physical activity.

For better health the ACSM (1998) and the USDHHS (1996), suggest that physical activity be performed regularly, that is, a minimum of 30 minutes of physical activity of moderate intensity (e.g. brisk walking) on most if not all days of the week. For greater benefit, physical activity of vigorous intensity, increased frequency or longer duration is recommended.

The literature suggests that many Americans need to increase their physical activity to reduce the risk of chronic health problems. Activities selected should be enjoyable, convenient, affordable, and appropriate for the individual's readiness, circumstances, current activity level, and risk factors. Strategies for increasing physical activity include realistic goal-setting, written contracts, logs, visual or auditory cues, telling others about goals for physical activity, using rewards, and eliciting the support from others (e.g., family and friends).

IMPLICATIONS FOR THE ADVANCED PRACTICE NURSE

The literature thus suggests that to provide a service that increases the likelihood of physical activity by walking, primary care providers like the APN must have sufficient knowledge and skills (Jones & McGlynn, 1990). Understanding the client's perceptions, experiences, abilities, sense of self-efficacy, resources, and readiness is necessary to provide successful walking interventions. Knowledge of current health recommendations and standard practices, and the theories, evidence, and interventions associated with behavior change is necessary to provide this service, as is the ability to assess the client's health, risks, endurance, aerobic capacity, and strength. The timing of various interventions and emphasizing the immediate symptom relief benefits of exercise such as decreased anxiety, improved mood, enhanced self-esteem, and enhanced self-efficacy are necessary to increase physical activities within this client population.

Nursing Education

Nursing education will benefit from this project because the content herein includes an updated synopsis of those theories, evidence and interventions that have provided positive outcomes in health promotion and disease prevention. This project reinforces the dynamic nature of the behavioral change process and methods to enhance health care practice and quality associated with achieving increased physical activity among primary care clients. This paper provides a review of the current scope of the problem associated with physical inactivity, the risks associated with physical activity, the determinants linked to physical activity, and the benefits of, and the barriers to physical activity. This project gives the APN the newest recommendations provided by the CDC and the ACSM to achieve cardiorespiratory benefits (e.g. "dosing" of physical activity), and explains the

application of the HBM and interventions used to increase physical activity in a common primary care population.

Nursing Research

This paper provides the basis for research that explores theoretical models, tools, protocols, concepts, and interventions for increasing physical activity through walking. The efficacy of the protocol and tools herein could be evaluated through a small pilot study. This could be accomplished by application of the protocol and tools to the target population in the primary care setting by this author. The author's clients could provide feedback regarding the protocol, tools, and interventions that could then be used to improve the protocol and tools. Effectiveness of the protocol and tools could be evaluated by comparing such outcomes as increased physical activity from baseline and/or maintenance of increased physical activity greater than six months with the same outcomes of the target population among other providers in the practice setting and/or other practice settings.

If the findings prove significant, another pilot study could be developed from this paper that examines an experimental group which receives the intervention described herein versus a control group which receives routine care. The results of such research could provide valuable data that would be useful in developing or refining interventions that support physical activity for this group or others. Further research, which uses a prospective approach, may provide data relating to long term outcomes using this protocol and tools.

In addition to research aimed at increasing physical activity, research is needed on factors and interventions that *maintain* physical activity such as walking. These factors may include enjoyability, control, decision-making processes, support and reinforcement, the effects of mass media campaigns,

and school or community programs for promoting physical activity in specific segments of the population.

Nursing Practice

Perhaps the greatest impact of this paper may be in nursing practice. Many experts agree that physical inactivity contributes to high mortality rates and increased risk of disease. And walking is recognized for its convenience as a form of exercise (Pate et al, 1997; SGR, 1996), the low risks associated with it (Panusch, 1994; Swan & Seedhom, 1993; Thompson et al, 1982), and the higher compliance rates associated with such moderate physical activities (Duncan et al, 1991; King et al, 1991; SGR, 1996). This paper provides the APN with an overview of the literature associated with walking and physical activity, the recommendations of experts in the area of walking and physical activity, and, based on the literature, a protocol and tools to increase the chances of client success with this population.

Because APNs work not only with clients, but also with families and communities, good practice entails involvement of the practitioner at multiple levels. At the client level, the literature shows that the APN should stay abreast of developments within the area of physical activity (i.e., promotion and maintenance), provide a thorough assessment and history, and provide support and long-term follow-up care for maintaining increased physical activity. If a client agrees to increase his/her physical activity, the APN should provide a rationale for treatment, involve the client in goal-setting and treatment plan, and provide detailed, concrete information in small amounts. Interventions should be designed to decrease forgetfulness, overcome barriers, and consider the client's unique qualities, circumstances, strengths, resources, and stages of readiness. By providing a quality service, involving the client in his/her care, and actively listening to the client, the APN can better establish a

trusting relationship that is essential to client compliance. At this level, the APN serves in the role of assessor, clinician, educator, planner, coordinator, counselor, and change agent.

At the family level, the APN can involve the family in supporting clients in meeting goals to increase physical activity. This involvement may later lead to other family members' interest and participation in increasing physical activity. At the family level, the APN acts as educator, consultant and client advocate.

At the community level, the APN can take on the broader roles of advocate and role model. The APN should support programs and policies that promote lifelong physical activities. These programs may be in the form of fun walks/runs and physical education, or church, workplace, and community center programs that promote lifelong activities such as gardening, walking or swimming. The APN should also support efforts to create environmental inducements to physical activity that are safe, attractive, and accessible such as parks and trails for walking and bicycling, or open schools for community recreation, support neighborhood watch groups, as well as efforts to increase sidewalks with curbcuts.

The community involvement of the APN transcends the overt relationship seen between the APN and his or her individual clients. The community involvement also involves the APN's support of policies that positively impact the health of the community. In the context of this paper, such policies would include healthcare insurance coverage for exercise counseling and rehabilitation, childcare arrangements to encourage participation of single women with children in physical activities, and federal and state assistance to disseminate information and provide services to the members of the community and under-served areas.

The implications for the APN – education, research, and practice – ultimately revolve around the acquisition of knowledge, research to confirm and improve practice, and application of that knowledge and those research findings to provide a quality service to the client. If this project is successful, its overall effect on the client, family, and/or community may be to decrease healthcare costs, by decreasing the demand for illness services, and improve quality of life.

Clinical Application of the Walking Protocol

A cover letter (Appendix A) provides information about the target population – 20-50 years of age – and the settings in which it would be used – primary care. It would also include an assessment tool (Appendix B) to be used by the provider to assist in determining client past and present physical activities, the Health Activities Equivalents –a table of activities which can be substituted for walking and meet the minimum requirements to provide cardiorespiratory benefits (Appendix C), a log for the client to record activities (Appendix D), a sample contract (Appendix E), a walking protocol diagram (Appendix F), and an educational brochure (Appendix G) for the client which will provide information on walking.

STEP 1: ASSESSING CLIENT INTEREST

At annual physical or annual review of client status, the client would be asked if he/she is interested in increasing physical activity by walking. This could be accomplished in one or more of several ways. First, the question "*Are you interested in increasing your physical activity by walking?*" may be placed on a questionnaire or medical review form to be answered by the client in the waiting room. This question would be accompanied by the question "*Would you like your primary care provider to talk with you about starting a walking program?*" This approach provides early determination of readiness for and interest in walking. This approach also allows the client the

freedom to accept or decline the intervention. If the client responds "yes" to the second question, he/she will be instructed to ask the receptionist for the "Walking Questionnaire" and to begin answering the questions.

Second, the educational brochure that accompanies this tool or some other form of notice (e.g., a written announcement) may be placed in the waiting room with instructions to inquire with the receptionist about completing the Walking Questionnaire. This approach has several benefits. First, it potentially reaches clients at an earlier point in their interest in and/or readiness for starting walking. Second, it also determines readiness for and interest in walking, and is non-coercive.

Third, the client may be asked by ancillary personnel (e.g., receptionists or staff who seat the client), using the questions above, about their interest in walking. If the client's response is "yes" to the second question, the staff will provide the client with the *Walking Questionnaire*. This approach may also potentially reach more clients earlier in their readiness for and/or interest in walking. However, unlike the other methods described above, the client may perceive this approach as coercive and/or awkward.

Fourth, the provider or the client may identify the need for increased physical activity. If the client is agreeable to walking as a physical activity, the provider can use the walking questionnaire to guide the interview or have the client complete the questions.

STEP 2: ASSESSING CLIENT RISK STATUS

The APN will review the Walking Questionnaire with the client and assess the ability of the client to increase physical activity by walking. This procedure requires that the provider make a clinical decision about the appropriateness of walking for the client. This decision would include the physical ability of the individual to walk, the client's current and past physical activity, the presence of

any health problems that place the client at risk if walking is initiated (e.g. acute myocardial infarction or respiratory difficulty, or Class III or IV CHF), and an assessment of the client's resources, environment, knowledge about walking, and perceived benefits and barriers to walking on a regular basis. The assessment tool provided (Appendix B) will assist the provider in asking those questions that will provide information about the individual's risk status.

If the provider determines that the individual is not physically suited to engage in walking to increase physical activity, less demanding activities should be considered or current activities may be increased until walking is appropriate. The literature indicates that this approach toward increasing physical activity increases the likelihood of success and helps avoid injuries and the risk of myocardial infarction.

STEP 3: SET REALISTIC GOALS

Once it is determined that the client is an appropriate candidate for walking, a realistic goal and timetable must be agreed upon by the provider and client. It is at this stage that the provider uses information gathered during the subjective and objective evaluation of the client to provide feedback about the client's health status, educate her/him regarding the benefits of walking and increased physical activity, clarify misconceptions, reinforce past and present positive health activities, and support the client's decision.

STEP 4: DETERMINE THE PLAN

It is important that the client agree to and/or suggest the date to start, the amount of walking, the frequency of walking, and the conditions under which it will occur. It may be useful for the provider to suggest a written contract (Appendix E) to formalize the goals. Later, this contract may be used to measure success and evaluate effectiveness of the plan.

Standard formulas for beginning and increasing walking have been developed and are used routinely once an individual is found to be an appropriate candidate for walking. The Surgeon General (USDHHS, 1996) has stated that cardiorespiratory benefit is achieved when an activity of "moderate" intensity is performed for at least 30 minutes, in which only sessions of 10 or more continuous minutes are counted, at less than 60% maximum heart rate for age, expends approximately 150 calories per day, is equivalent to walking and uses sustained, rhythmic muscular movements, 5-7 days per week. For an individual with no major health problems, maximum heart rate (mhr) is generally determined by the following formula: 220 beats per minute (bpm) minus age in years. Thus, for a healthy 40 year old, walking that elicits a heart rate of approximately108 beats per minute [(220-40) - .6) and meets the duration, intensity and frequency requirements set forth by the Surgeon General (1996) provides cardiorespiratory benefit.

Establishing rewards may increase client adherence to the planned walking activity. Rewards for achieving daily goals such as soaking in a bathtub instead of taking a shower and/or going to a movie for achieving weekly goals provide pleasurable incentives for meeting goals while also fulfilling the need for cleanliness and rest. It is important, however, that the rewards identified be administered in a timely fashion and that the client find the rewards of significant value to provide motivation for the new walking behavior.

It is at this stage that the provider also assists the client in identifying resources and barriers to achieving the identified goal. The assessment tool (Walking Questionnaire, Appendix B) asks the client those questions that elicit the client's motivation for pursuing walking, prior and current physical activity, health risks and medication use, perceived and actual benefits and barriers to increase physical activity, and actual and perceived resources for increased physical activity at home,

work and in the community. By using this tool, the provider will better understand the client's motivation, perceptions and resources for walking. The information provided by the questionnaire can be completed by the client prior to being seen by the provider or the provider can use the tool during an encounter to elicit the information.

STEP 5: OVERCOMING BARRIERS AND PREVENTING RELAPSE

To increase adherence and prevent relapse, the provider needs to provide anticipatory guidance. Anticipatory guidance for a client might include discussion of strategies to overcome barriers such as blocking time into a client's schedule to walk, setting realistic goals, using visual cues, walking with a partner, having the client tell others about their goals, using the HAE's when walking is not a viable option (e.g., safety, weather), and/or using rewards to reinforce the walking activities that are achieved.

A log sheet (Appendix D) is provided to the client that, if used correctly, visually provides immediate information on walking activities and HAE's over a time period. The log sheet can be used to measure success, identify change, reinforce physical activity behavior, and/or aid in identifying patterns that support or inhibit regular physical activity.

It is extremely important that the APN emphasize that a minimum of 10 continuous minutes of walking totaling 30 minutes per day (or the HAE's) is necessary 5-7 days per week to obtain cardiorespiratory benefit. These amounts have been found to be the minimum necessary to obtain a risk reduction in chronic and preventive diseases. For the client who meets the criteria for inclusion and has been recently physically active, this goal of 30 minutes per day 5-7 days per week may be achieved within a few weeks or months. For the client who meets the criteria for inclusion but who has not been physically active, smaller goals such as five minutes per day three days per week may be

more realistic for the client – with the ultimate goal being 30 minutes/day, 5-7 days per week (30-5-7). Finally, the provider should make it clear that he/she will be a source of support and advice to the client. Support is identified as one of the main reasons for increasing physical activity. Step 6 has been developed to increase the likelihood of client success.

STEP 6: FOLLOW-UP

A telephone call or other form of communication by ancillary staff or provider is suggested after two weeks, or as agreed upon by the client and APN. This contact provides support that may not be available to the client from family, friends, coworkers, or siblings and allows for early evaluation of the plan. Any contacts with the client and any recommendations or changes in plan must be documented in the client's record to maintain continuity and patient safety.

If the client is successful at achieving initial goals, the APN should provide support: congratulate, identify success, and discuss barriers or anticipated problems. A follow-up call or contact by ancillary staff or provider should be scheduled for 12 weeks after start of walking program. Ongoing contact by the health care team provides the opportunity both to support the client and to evaluate the plan.

If the client is unable to achieve initial goals, follow-up contact by the provider is recommended to reassess the client and the appropriateness of plan and to make recommendations. If new goals and/or a date for a new start are determined, a follow-up contact by ancillary staff should be agreed to by provider and client. If the client is still unable to meet new goals by agreed upon date, follow-up by provider is recommended to reassess the goals, the plan and the client's circumstances.

STEP 7: EVALUATION

Evaluation of walking program effectiveness is an ongoing process that consists of both subjective and objective components. According to the literature (Shepard, 1988; Sallis et al, 1992) and the HBM (Rosenstock, 1974), the client's subjective evaluation of progress or benefits from walking is instrumental in increasing the likelihood of behavior change such as walking. Because of the impact of such client perceptions on the likelihood of behavior change, it is extremely important that the APN continuously assess the client's views, clarify misconceptions, use objective measures to identify behavior change, and provide support.

The objective component of the evaluation of the client's walking program is determined by whether the agreed upon goals are met and changes in walking behaviors, or number of HAE's, above baseline. These objective data provide useful information in determining goal achievement, identifying barriers to walking, and/or determining new goals.

Appendix A

ROBERT J. ZIOLA
2714 ELMWOOD
ANN ARBOR, MI. 48104
SEPTEMBER, 1999

Dear Primary Care Provider,

Enclosed are materials designed to assist you in providing information and tools to your sedentary but otherwise healthy clients, aged 20-50, who desire to begin walking as a form of regular physical activity. The recommendations presented are based on guidelines by the 1996 U.S. Surgeon General's Report on Physical Fitness and Health and are meant to provide the *minimum* activities required to receive cardiorespiratory benefit and to aid in disease prevention.

Included in these materials is an assessment tool to guide you in assessing client past and present physical activities, and an educational brochure for your clients who are ready and able to begin a walking program. The educational brochure contains information on walking, strategies to support walking, the *Health Activities Equivalents* table which presents substitutes for walking that meet the minimum requirements for cardiorespiratory benefits, and a sample recording form which can be copied and used by your clients for tracking their activities.

I hope you find the enclosed materials useful in your practice. Please contact me if you have any questions or if I can be of any help.

Sincerely,

Robert J. Ziola MSN

Appendix B

WALKING QUESTIONNAIRE

Directions: To design a fitness program that best fits your needs, please complete the following questions.

1. Why do you want to begin walking?

2. Do you have any **medical conditions** that keep you from exercising? ___ yes ___ no
   If **yes**, please specify: _____

3. Do you have any of the following health problems?
   ___ Asthma ___ High Blood Pressure (Hypertension)
   ___ Obesity ___ Heart Problems

4. What **prescription** or **over-the-counter** medications, **supplements** or **herbs** – if any – do you use?

5. Do you have any **environmental allergies** (for example, to pollen, dander, dust, etc.)? If yes, please list.

6. What kind of **physical activity** have you done regularly in the **past** (e.g. in school, in the military, for recreation)?
   a. Please check the items that apply:
   ___ walking ___ running ___ biking ___ swimming ___ tennis
   ___ baseball ___ aerobics ___ dancing ___ basketball ___ football
   ___ soccer ___ gardening ___ rowing ___ treadmill ___ squash
   ___ weight lifting ___ Stairmaster ___ racquetball ___ volleyball
   ___ other (Please describe: _____)

7. How long and what intensity (ex. light, moderate or vigorous) did you do the activities that you checked above?

   a. If you stopped an activity above, why?

8. What kind of **physical activity** do you **regularly** (3-7days/week) do **now**?
   a. Please check the items that apply:
   ___ walking ___ running ___ biking ___ swimming ___ tennis
   ___ baseball ___ aerobics ___ dancing ___ basketball ___ football
   ___ soccer ___ Stairmaster ___ gardening ___ treadmill
   ___ weightlifting ___house cleaning ___ hiking ___ rowing
   ___ seasonal (ex. shoveling snow, raking leaves, using a pushmower)
   ___ wheelchair ergometry ___ other: _____

b. Of those activities that you do now,
How long have you done them? Indicate number of ___ weeks, ___ months, **or** ___ years.
How many **days per week** do you do them? ___ days
How many **minutes per week** do you do spend doing them? ___ minutes per week

9. In general, at what **intensity** do you do these activities now?
___ light (little or no effort needed - comfortable)
___ moderate (breath heavily)
___ vigorous (out of breath or fatigued by the end of the activity)

10. What do you **enjoy** about the activities that you do?
___ Feel better
___ Stay fit
___ Relieve stress
___ Socialize
___ Change of scenery
___ other (please specify: _____)

11. Do you **currently** walk? ___ yes
___ no

a. If **yes**, how many **days per week** ?___
How many **minutes per week** ?___
And at what **intensity**? ___ light ___ moderate ___ vigorous

b. Do you usually spend **at least 10 continuous minutes** walking? ___ yes ___ no

c. Do any of your immediate family, friends or coworkers walk? ___ yes ___ no
If **yes**, please list.

Directions: Below are statements that relate to **attitudes** about **walking**. Please indicate as many as apply to you.

___ I don't usually have enough time
___ It's often not convenient
___ It's often too cold outside
___ It's often too hot outside
___ It's not safe outside
___ I'm too depressed
___ I'm not motivated
___ I'm too old
___ I'm too overweight
___ I don't have anyone to walk with
___ I don't like working up a sweat
___ I have bad knees
___ I have asthma
___ It's boring
___ I travel a lot
___ other (please specify): _____

Directions: Please check the statements about **walking** that are **applicable to you**. Please indicate as many as apply to you.

___ I want to **lose weight**
___ I want to **prevent health problems**
___ I want to **look better**
___ I want to **feel better**
___ I want to **sleep better**
___ I want to **improve my health**
___ I want to **control my diabetes**
___ I want to **control my high blood pressure**
___ I want to **have more energy**
___ I want to **walk with others**
___ I like to **walk alone**
___ Walking is **inexpensive**
___ Walking helps **relieve stress**
___ Walking is **dangerous in my neighborhood**
___ There are **areas to walk** near my home or work which include:
    ___ malls
    ___ gyms
    ___ trails
    ___ parks
    ___ sidewalks
    ___ parking lots
    ___ other (please specify): _____

12. How **fit** do you feel?
    ___ very fit
    ___ moderately fit
    ___ poor

13.What, if any, are the **main barriers** to walking for you?

Appendix C

Health Activity Equivalents

Table 1
Examples of Moderate Physical Activity

Less Vigorous Activity Requires More Time To Gain Benefit

Washing and waxing a car for 45-60 minutes
Washing windows or floors for 45-60 minutes
Playing Volleyball for 45 minutes
Playing touch football for 30-45 minutes
Gardening for 30-45 minutes
Wheeling self in wheelchair for 30-40 minutes
Walking 1 ¾ miles in 35 minutes (20 min/mile)
Basketball (shooting baskets) for 30 minutes
Bicycling 5 miles in 30 minutes = 10 mph
Dancing fast (social) for 30 minutes
Pushing a stroller 1 ½ mile in 30 minutes
Raking leaves for 30 minutes
Walking 2 miles in 30 minutes
Water aerobics for 30 minutes
Swimming laps for 20 minutes
Wheelchair basketball for 20 minutes
Basketball (playing a game) for 15-20 minutes
Bicycling 4 miles in 15 minutes = 16 mph
Jumping rope for 15 minutes
Running 1 ½ miles in 15 minutes (10 min/mile)
Shoveling snow for 15 minutes
Stairwalking for 15 minutes

More Vigorous Activity Requires Less Time To Gain Benefit

Note. Adapted from the U.S. Surgeon General's Report 1996. August, 1999; Robert J. Ziola.

Appendix D

Activity Log

Directions: Use this log to keep track of your walking *(distance or time)* or the substitute activity/activities you accomplished on a given day. Each log sheet section covers **one week**. Keep an **unused copy** of this log sheet to record future activities.

In the boxes across from **Date,** enter the day(s) and month (e.g. 1/24 for January 24) for your goals that week.

In the area below **Activity**, write-in your walking goal or substitute activities and mark the amount of time – in minutes – or the distance to be covered that day. (If you use a Health Activity Equivalent in place of walking, it may be helpful to include under "Activity," the amount of time or distance necessary to meet your walking goal.)

If you achieve your goal for the day, **shade-in** the corresponding **date box** (Ex. (2/23).

Date:							
Activity	**Time or Distance**						
_____							
_____							
_____							
_____							
_____							

Date:							
Activity	**Time or Distance**						
_____							
_____							
_____							
_____							
_____							

Date:							
Activity	**Time or Distance**						
_____							
_____							
_____							
_____							

Appendix E

Sample Contract

The purpose of this contract is to assist you in meeting your goals to increase your physical activity. Contracts have been used successfully by many people and are meant to remind you of the commitment you have to yourself. Below is a sample contact that can assist you in reaching your goals. Keep it where you want. Some people put it on their refrigerator – others place it in a less public place.

I, _____, agree to start walking _____*(goal)*_____.

I will begin walking on _*(day of week)*_, _*(date)*_.

I will accomplish this by walking _*(distance)*_, _____ times per _____.

To support me in reaching my goals I will:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

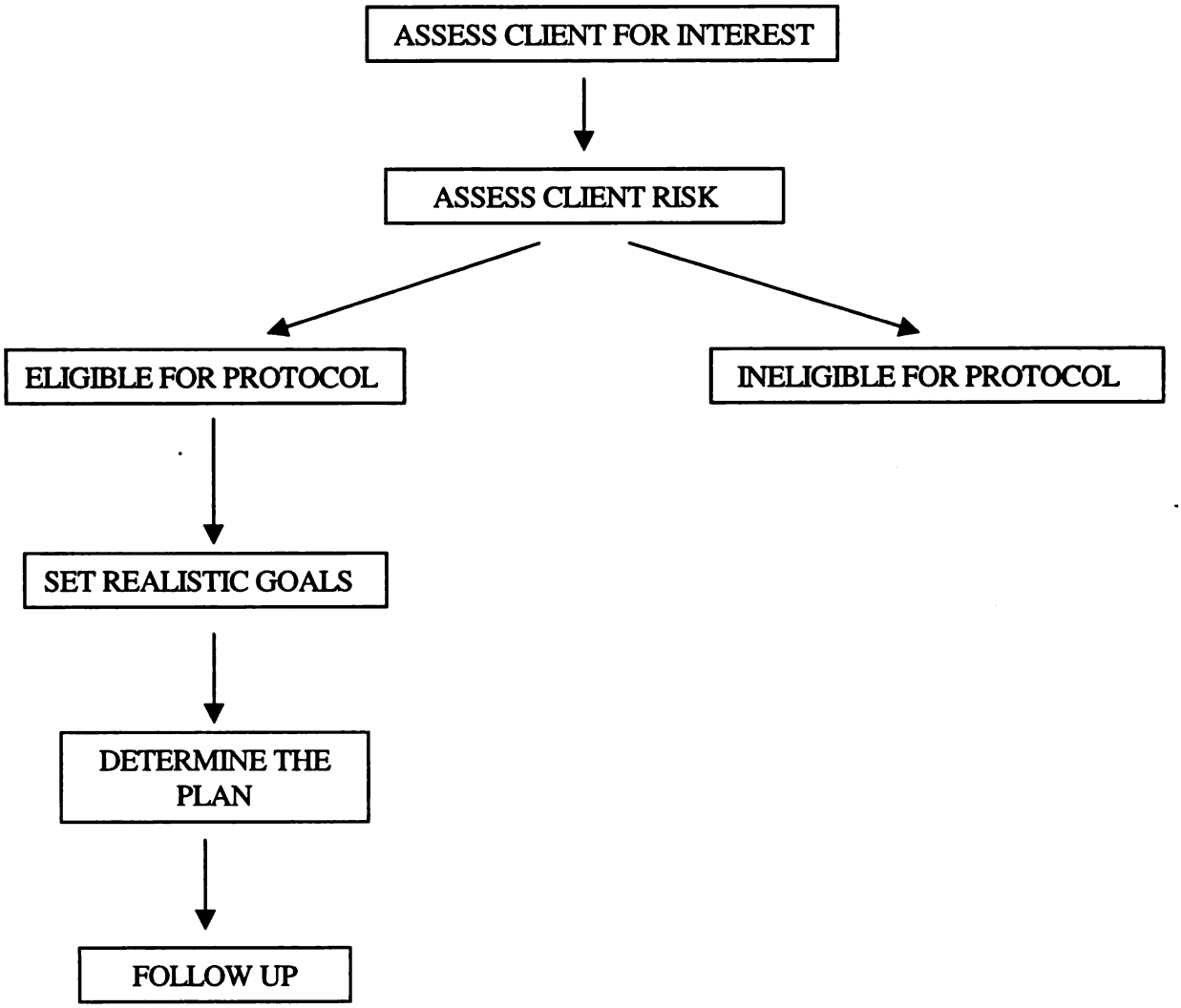
When I reach my _*(weekly/monthly)*_ goals, I will reward myself by _____ _____.

If I am having difficulty attaining my goals, I will _____ _____.

Signature and date _____

Appendix F

Figure 3. WALKING PROTOCOL DIAGRAM



Appendix G

MAKING IT WORK

HAVE FUN – walking can be enjoyable as well as beneficial

REWARD YOURSELF for success

KEEP A LOG

USE REMINDERS like notes on your door or refrigerator

WRITE A CONTRACT to walk on specific days and times – and let others know!

COMPETE with a friend

WHAT ELSE CAN YOU DO?

Studies have shown that a number of light to moderate activities such as raking leaves or shoveling snow can *substitute* for walking and more traditional forms of exercising and *still* provide the health benefits.

So if you know you won't be able to meet your walking goal for a day due to circumstances, you may be able use one of the following *substitutes:*

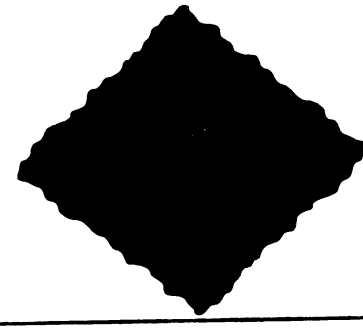
Stairwalking
Gardening
Jumping rope
Jumping rope
Dancing fast
Pushing a stroller
Wheelchair aerobics
Washing and waxing a car
Water aerobics
Playing touch football
Bicycling
Swimming

WHO TO CONTACT

Your primary care providers at this location can make the transition to increasing your physical activity easier, more enjoyable and safe.

Inform the receptionist or health care professionals here about your interest in being more active and allow us to assist you.

Walking for the Health of It!



Improving Your Health

Useful Information to Make the Transition to Walking Easy, Safe and Fun

Off:

Tel:

Walking For the Health of It

YOU CAN BE MORE ACTIVE

WHO: people of all ages and sizes can increase physical activity by walking and gain health benefits.

BENEFITS: like other forms of physical activity, walking can decrease the risk of heart disease and certain cancers; control weight; prevent or reduce high blood pressure; and even help relieve the symptoms of anxiety and depression.

WALKING unlike other forms of exercise can be customized to your schedule, pace and needs. It 's inexpensive, convenient and can provide immediate as well as long term benefits.

HOW TO GET STARTED

First, consult with your primary care provider. They can recommend safe and helpful ways to achieve your goals and give you support along the way.

Next, you'll need comfortable clothes and shoes – preferably walking shoes. And don't forget to warm-up and do a few simple stretches.

BE REALISTIC

Most people fail when they start exercising because they set their goals too high – take it **one step at a time**.

Don't over commit yourself. Perhaps walking one day a week is more realistic that 5 days a week. And start *slow* – you'll be more willing to do it again!

TIPS FOR SUCCESS

A MINIMUM* of *TEN CONSECUTIVE MINUTES of an activity must be maintained to gain a health benefit

WALK WITH A PARTNER - at home or at work

LET PEOPLE KNOW that you're walking – they can support you

MAKE IT CONVENIENT – if you're too tired in the afternoon, try walking in the morning or during lunch

MAKE TIME IN YOUR SCHEDULE – if you're serious about being more active, you have to make time to walk

References

American College of Sports Medicine. (1990). The recommended quantity and quality of exercise for developing and maintaining cardiorespiratory and muscular fitness in healthy adults. Medicine and Science in Sports and Exercise, 22 (12), 265-274.

American Nurses' Association. (1994). Nursing: A social policy statement. Kansas City, MO: American Nurses' Association.

Andrew, G. A., Oldridge, N. B., Parker, J. O., Cunningham, D. O., & Rechnitzer, P. A. (1981). Reasons for dropout from exercise programs in post-coronary patients. Medicine and Science in Sports and Exercise, 13 (3), 164-168.

Bandura, A. (1977). Self-efficacy. Toward a unifying theory of behavioral change. Psychology Review, 84 (2), 191-215.

Barnekow-Bergkvist, M., Hedberg, G., Janlert, V., & Jansson, E. (1996). Physical activity pattern in men and women at the ages of 16 and 34 and development of physical activity from adolescence to adulthood. Scandinavian Journal of Medicine and Science in Sports, 6 (6), 353-370.

Berlin, J. A., & Colditz, G. A. (1990). A meta-analysis of physical activity in the prevention of coronary heart disease. American Journal of Epidemiology, 132 (4), 612-628.

Blair, S. N., Kampert, J. B., & Kohl, H. W. (1995). Influences of cardiorespiratory fitness and other precursors on cardiovascular disease and all-cause mortality in men and women. JAMA, 273 (3), 205-210.

Blair, S. N., Kohl, H. W., & Paffenbarger, R. S., Jr. (1989). Physical fitness and all-cause mortality: a prospective study of healthy men and women. JAMA, 262 (17), 2395-2401.

Bouchard, C., Shephard, R., J., & Stephens, T. (Eds.). (1994). Physical activity, fitness, and health: International proceedings and consensus statement. Champaign, IL: Human Kinetics.

Brownell, K. D. (1986). Understanding and preventing relapse. American Psychologist, 41 (9), 765-782.

Brownwell, K. D., Stunkard, A. J., & Albaum, J. M. (1980). Evaluation and modification of exercise patterns in the natural environment. American Journal of Psychiatry, 137 (12), 1540-1545.

Butler, R. N., Davis, R., Lewis, C. B., Nelson, M. E., & Strauss, E. (1998). Physical fitness: How to help older patients live stronger and longer. Geriatrics, 53 (9), 26-28, 31-32, 29-40.

Caspersen, C. J., Merritt, R. K., & Stephens, T. (1994). International physical activity patterns: A methodological perspective. In R. K. Dishman (Ed.), Advances in exercise adherence (pp. 73-110). Champaign, IL: Human Kinetics.

Caspersen, C. J., Powell, K. E., & Christenson, G. M. (1985). Physical activity, exercise, and physical fitness: Definitions and distinctions for health-related research. Public Health Reports, 100. 126-130.

Dalsky, G. P., Stocke, K. S., Ehsani, A. A., Slatopolsky, E., Lee, W. C., & Birge, S.J. (1988). Weight-bearing exercise training and lumbar bone mineral content in postmenopausal women. Annals of Internal Medicine, 108, 824-828.

Demarco, T., & Sidney, K. (1989). Enhancing children's participation in physical activity. Journal of School Health, 59 (8), 337-340.

Dishman, R. K. (Ed.). (1994). Advances in exercise adherence. University of Georgia: Human Kinetics.

Dishman, R. K. (1991). Increasing and maintaining physical activity and exercise. Behavior Therapy ,41 (1), 3-15.

Douthitt, V. L. (1994). Psychological determinants of adolescent exercise adherence. Adolescence, 29 (115), 711-722.

Duncan, J. J., Gordon, N. F., & Scott, C. B. (1991). Women walking for health and fitness: How much is enough? JAMA, 266 (23), 3295-3299.

Epstein, L. H., Wing, R. R., & Thompson, J. K. (1980). Attendance and fitness in aerobic exercise: The effects of contract and lottery procedures. Behavior Modification, 4 (6), 465-79.

Ferrini, R., Edelstein, S., & Barrett-Conner, E. (1994). The association between health beliefs and health behavior change in older adults. Preventive Medicine, 23 (1), 1-5.

Friedenreich, C. M., Thune, I., Briton, L. A., & Albanes, D. (1998). Epidemiological issues related to the association between physical activity and breast cancer. Cancer, 83 (Suppl. 3), 600-610.

Fries, J. F., Morfeld, D., & Hubert, H. B. (1994). Exercise, musculoskeletal disability, pain, and medical care costs: 9-year longitudinal study. Arthritis and Rheumatology, 37, S198.

Ghali, J. (1990). Trends in hospitalization rates for heart failure in the United States 1973-1986. Archives of Internal Medicine, 150 (7), 951.

Grimley, D. M., Prochaska, G. E., & Prochaska, J. O. (1993). Condom use assertiveness and the stages of change with main and other partners. Journal of Applied and Biobehavioral Research, 1 (2), 152-153.

Grimley, D. M., Prochaska, J. O., Velicer, W. F., & Prochaska, G. E. (1995). Contraceptive and condom use adoption and maintenance: A Stage Paradigm Approach. Health Education Quarterly, 22 (4), 455-470.

Hatziandreu, E. I., Koplan, J. P., Weinstein, M .C., Caspersen C. J., & Warner, K. E. (1988). A cost-effectiveness analysis of exercise as a health promotion activity. American Journal of Public Health, 78, 1417-1421.

Hellman, E. A. (1997). Use of the stages of change in exercise adherence model among older adults with a cardiac diagnosis. Cardiopulmonary Rehabilitation, 17 (2), 145-155.

Huddy, D. C., Hebert, J. L., Hyner, G. C., & Johnson, R. L. (1995). Facilitating changes in exercise behavior: Effect of structured statements of intention on perceived barriers to action. Psychological Reports, 76 (3), 867-875.

Jacobson, P. C., Beaver, W., & Grubb, S. A. (1984). Bone density in women: College athletes and older athletic women. Journal of Orthopedic Research , 2 (1), 8-32.

Jaglal, S. B., Kreiger, N., & Darlington, G. (1993). Past and recent physical activity and the risk of hip fractures. American Journal of Epidemiology, 138 (2), 107-118.

Jones, D. A., Ainsworth, B. E., Croft, J. B., Macera, C. A., Lloyd, E., & Yusuf, H. R. (1998). Moderate leisure-time physical activity: Who is meeting the public health recommendations? A national cross-sectional study. Archives of Family Medicine, 7 (3), 285-289.

Jones, R. L. & McGlynn, T. J. (1990). The prescription for fitness. Journal of the American Academy of Physician Assistants, 3 (8), 356-362.

Juneau, M., Rogers, F., & Desantos, V. (1987). Effectiveness of self-monitored homebased moderate-intensity exercise training in middle-aged men and women. American Journal of Cardiology, 60 (1), 66-77.

King, A. C., Taylor, C. B., & Haskell,W. L. (1990). Identifying strategies for increasing employee physical activity levels: Findings from the Standard and Lockheed exercise survey. Health Education Quarterly, 17 (3), 269-285.

King, A.C. (1992). Community interventions for promotion of physical activity and fitness. In H. Holloszy (Ed.), Exercise and sports sciences reviews, 19, 211-59. Williams & Wilkens: Baltimore.

King, A. C., Haskell, W. L., & Taylor. (1991). Group vs home-based exercise training in healthy older men and women: A community-based clinical trial. JAMA, 266 (11), 1535-1542.

King, A. C., Taylor, C. B., Haskell, W. L. & Debusk, R. F. (1988). Strategies for increasing adherence to and long-term maintenance of home-based exercise training in healthy middle-aged men and women. American Journal of Cardiology, 61 (8), 628-632.

Klonoff, E. A., Annechild, A., & Landrine, H. (1994). Predicting exercise adherence in women: The role of psychological and physiological factors. Preventive Medicine, 23 (2), 257-262.

Kohl, H. W., & Powell, K. E. (1992). Physical activity, physical fitness, and sudden cardiac death. Epidemiology Review, 14 (1), 37-58.

Krug, L. M., Haire-Joshu, D., & Heady, S. A. (1991). Exercise habits and exercise relapse in persons with non-insulin-dependent diabetes mellitus. Diabetes Educator, 17 (3), 185-188.

Kushi, L. H., Fee, R. M., Fosom, A. R., Mink, P. J., Anderson, K. E., & Sellers, T. A. (1997). Physical activity and mortality in postmenopausal women. JAMA, 277 (16), 1287-1292.

Magnus, K., Matroos, A., & Strackee, J. (1979). Walking, cycling, gardening with or without seasonal interruption in relation to acute coronary events. American Journal of Epidemiology, 110 (6), 724-723.

Marcus, B. H., King, T. K., Clark, M. M., Pinto, B. M., & Bock, B. C. (1996). Theories and techniques for promoting physical activity behaviors. Sports Medicine, 22 (5), 321-328.

Marcus, B. H., & Stanton, A. L. (1993). Evaluation of relapse prevention and reinforcement interventions to promote exercise in sedentary females. Research Quarterly of Exercise and Sports Medicine, 64 (4), 447-452.

Marcus, B. H., Banspach, S. W., Lefebvre, R. L., Rossi, J. S., Carleton, R. A., & Abrams, D. B. (1992). Using the stages of change model to increase the adoption of physical activity among community participants. American Journal of Health Promotion, 6 (6), 424-429.

McAuley, E., Mihalko, S. L., & Bane, S. M. (1997). Exercise and self-esteem in middle-aged adults: Multidimensional relationships and physical fitness and self-efficacy influences. Journal of Behavioral Medicine, 20 (1), 67-83.

Muto, T., Saito, T., & Sakurai, H. (1996). Factors associated with male workers' participation in regular physical activity. Industrial Health , 34 (4), 307-21.

Neale, A.V., Singleton, S.P., Dupuis, M.H., & Hess, J.W. 1990. The use of behavior contracting to increase exercise activity. American Journal of Health Promotion 4(6), 441-447.

Nemeroff, C. J., & Karoly, P. (1991). In H. Kanter & R. Goldstein (Eds.), Helping people change. (pp. 122-160). Pergamon Press: New York.

Oka, R. K., King, A. C., & Young, D. R. (1995). Sources of social support as predictors of exercise adherence in women and men ages 50 to 65 years. Women's Health, 1 (2), 161-75.

Paffenbarger, R. S., Jr., Hyde, R. T., & Wing, A. L. (1984). A natural history of athleticism and cardiovascular health. JAMA, 252 (4), 491-495.

Paffenbarger, R. S., Jr., Hyde, R. T., & Wing, A. L. (1993). The association of changes in physical-activity level and other lifestyle characteristic with mortality among men. New England Journal of Medicine, 328 (8), 353-548.

Panush, R. S. (1994). Physical activity, fitness, and osteoarthritis. In C. Bouchard & R. Shephard (Eds.), Physical activity, fitness and health. Champaign, IL: Human Kinetics.

Pate, R. R., Pratt, M., Blair, S. N. (1995). Physical activity and public health: A Recommendation from the Centers for Disease Control and Prevention and the American College of Sports Medicine. JAMA, 273 (5), 402-407.

Prochaska, J. O., DiClemente, C. C., Velicer, W. F., & Ross, J. S. (1993). Standardized, individualized, interactive, and personalized self-help programs for smoking cessation. Health Psychology, 12 (3), 399-405.

Prochaska, J. O., Redding, C. A., & Evers, K. E. (1997). The Transtheoretical Model and Stages of Change. In R. Glanz, B. Lewis & S. Rimer (Eds), Health behavior and health education (pp. 41-59). Jossey-Bass: San Francisco.

Rosenstock, I. M. (1974). Historical origins of the Health Belief Model. In R. Becker (Ed.), The Health Belief Model and personal health behavior. (pp. 1-26). Charles B. Slack, Inc: New Jersey.

Sallis, J. F., Howell, M. F., & Hofstetter, C. R. (1992). Predictors of adoption and maintenance of vigorous physical activity in men and women. Preventive Medicine, 21 (2), 237-51.

Sallis, J. F., & Owen, N. (1997). Ecological models. In R. Glanz, B. Lewis & S. Rimer (Eds.), Health behavior and health education (pp. 403-424). Jossey-Bass: San Francisco.

Shepard, R. J. (1988). Exercise adherence in corporate setting: Personal traits and program barriers. In R. Dishman (Ed.), Exercise adherence: Its impact on public health (pp. 305-319). Human Kinetics: Champaign.

Siscovich, D. S., Weiss, N. S., Fletcher, R. H., & Lasky, T. (1984). The incidence of primary cardiac arrest during vigorous exercise. New England Journal of Medicine, 311 (14), 874-877.

Skinner, B. F. (1953). Science and human behavior. MacMillan: New York.

Strecher, V. J., & Rosenstock, I. M. (1997). The Health Belief Model. In R. Glanz, B. Lewis & S. Rimer (Eds.), Health behavior and health education (pp. 41-59). Jossey-Bass: San Francisco.

Swan, A. C., & Seedhom, B. B. (1993). The stiffness of normal articular cartilage and the predominant acting stress levels: Implications for the etiology of osteoarthritis. British Journal of Rheumatology, 32 (1), 16-25.

Telama, R., Leskinen, E., & Yang, X. (1996). Stability of habitual activity and sport participation: A longitudinal tracking study. Scandinavian Journal of Medicine and Science in Sports, 6 (6), 371-8.

Thompson, P. E., Fink, E. J., Funk, E. J., Carleton, R. A., & Sturner, W. Q. (1982). Incidence of death through jogging in Rhode Island 1975-1980. JAMA, 247 (18), 2535-2538.

Tsai, S. P., Baun, W. B., & Bernacki, E. J. (1987). Relationship of employee turnover to exercise adherence in a corporate fitness program. Journal of Occupational Medicine, 29 (3), 272-275.

U.S. Department of Health and Human Services. (1990). Healthy People 2000: National health promotion and disease prevention objectives. U.S. Department of Health and Human Services, Office of Public Health and Sciences, Office of Disease Prevention and Health Promotion. (DHHS Publication No. PHS 91-50212). Washington, DC: U.S. Government Printing Office.

U.S. Department of Health and Human Services. (1995). Healthy People 2000 midcourse review and 1995 revisions. U.S. Department of Health and Human Services, Office of Public Health and Sciences, Office of Disease Prevention and Health Promotion. http://www.odphp.osophs .dhhs.gov/pubs/hp2000/midcrs1.html. Retrieved 02/22/99.

U.S. Department of Health and Human Services. (1996). Physical activity and health: A report of the surgeon general. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. http://www.cdc.gov/nccdphp/sgr/sgr.htm. Retrieved 02/22/99.

U.S. Department of Health and Human Services. (1998). Guide to Clinical Preventive Services. Report of the U.S. Preventive Services Task Force. U.S. Department of Health and Human Services, Office of Public Health and Sciences, Office of Disease Prevention and Health Promotion. 2nd Edition. http://158.72.20.10/pub s /guidecps/text /CH55.txt. Retrieved 02/22/99.

Wankel, L. M. (1984). Decision-making and social support strategies for increasing exercise involvement. Journal of Cardiac Rehabilitation, 4 (4), 124-135.

Wannamethee, S. G., Shaper, A. G., & Walker, M. (1998). Changes in physical activity, mortality, and incidence of coronary heart disease in older men. Lancet, 351 (9116), 1603-1608.