

# Walking and Jogging

for Health and Wellness



Frank Rosato

SIXTH EDITION

# Walking & Jogging For Health & Wellness

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**Frank Rosato, Ed.D**

University of Memphis



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**Walking & Jogging: For Health & Wellness, Sixth Edition****Frank Rosato**

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# Preface

The fields of exercise science and health promotion are dynamic, and the pace of change is accelerating. What was considered to be an article of faith just 5 to 10 years ago may be discarded like a pair of worn-out walking or jogging shoes today. In this edition, new information has replaced outdated information, new trends have been identified, and the concepts and content of this book are supported primarily by research that has been reported since the fifth edition was published.

The focus of the sixth edition of *Walking and Jogging for Health and Wellness* is consistent with that of its predecessors: The emphasis remains on enhancing health and fitness. The objective is not to turn novice exercisers into fierce competitors, although the material in this edition and its intent does not preclude that outcome. But the primary purpose is to introduce novice exercisers to the benefits of walking and jogging, and to present persuasive and logical reasons why they should take the time and make the effort to include exercise in their daily lives. The emphasis is to encourage ordinary people to start moving to enhance their health, or to improve their physical appearance, or to develop physical fitness, or for other reasons.

This edition provides the guidelines for novices to begin and sustain a walking or jogging program safely

and effectively. Also, veteran walkers and joggers may find information that is useful for motivation and for refining established programs.

This edition has been substantially revised. Chapter 2 was deleted but some of the important concepts concerning motivation for exercise were incorporated in Chapter 3, which is now the new Chapter 2. As a result, the current edition has 7 instead of 8 chapters. A second significant change is the updating of content and references. Most of the older references have been replaced by those having publication dates later than 2007 and these reflect the newer content. A third change is the conversion of the text from black and white to color.

I would like to thank Liana Sarkisian, development editor for this project, for her patience and support throughout an accelerated revision process. I would also like to thank the following students who took time out of their busy schedules to appear as models for this edition: La Keisha Bell, Molka Horton, Lizzie Liddell, Maricah Le Vells, Ashley Mitchell, Sarah Newsome, Koneisha Thomas, and Robert Williams. Many thanks to Shannon Werne for taking the photos for this edition.

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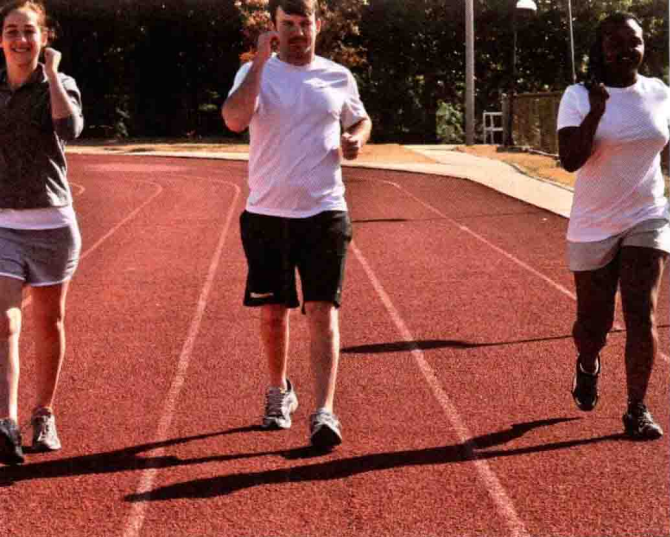
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Shannon Werne

# 1

## Physical Fitness: An Overview

### OUTLINE

America on the Move  
Aerobic Exercise and Health  
Trends in Fitness and Sports  
ACSM and CDC Guidelines  
Exercise Programs in Business  
and Industry  
The Costs of Sedentary Living  
Disease and Death Patterns  
Managing Time  
Rationale for Choosing Walking  
and Jogging  
Health-Related Fitness  
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**N**ational polls, surveys, and the mass media have documented the extent of the physical fitness movement in the United States. Further, studies regarding the cost-effectiveness of fitness and wellness programs in the workplace attest to their cost-effectiveness in terms of savings in health-care costs.

In this chapter you will be introduced to the extent of Americans' participation in exercise, its health benefits, and degrees of fitness. This chapter includes guidelines and rationales for exercise developed by the American College of Sports Medicine (ACSM) and the Centers for Disease Control and Prevention (CDC).

Some time-management tools are presented to help people find pockets of time during the day for worthwhile pursuits such as exercise. This chapter includes a rationale for choosing walking and jogging as safe and expeditious modes of activity for attaining physical fitness and enhancing health.

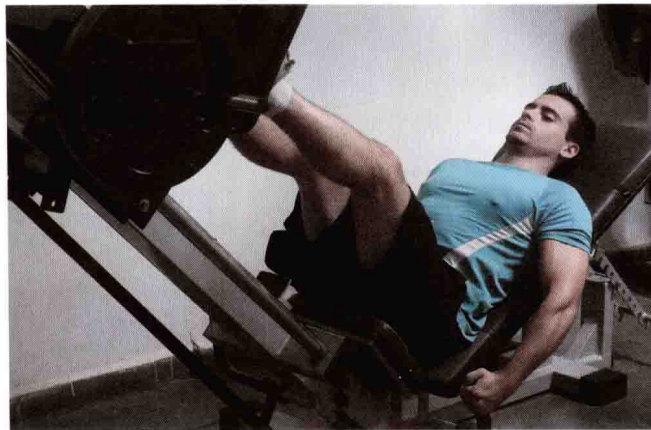
### America on the Move

Throughout the United States we see people walking, jogging, cycling, and swimming to attain physical

fitness, weight loss, and other health-promoting benefits. Fitness clubs are packed with people doing aerobics to music and exercising with weights, stair-steppers, rowing machines, treadmills, elliptical trainers, and bikes. Exercise equipment is becoming more and more sophisticated every day. Information regarding fitness and health appears in the print and electronic media daily.

From this frenzy of activity, you easily could gain the perception that most Americans are fully involved in the exercise movement. Unfortunately, perception and reality are not the same. Information gathered during the last 30 years indicates that most Americans have not exercised enough to have a positive impact on their fitness level or their health status.

During the early years, literally millions of sedentary people began exercising aerobically and the movement grew rapidly. Eventually the influx of new participants slowed. In the past few years a disturbing trend has begun to surface: The exercise movement has reached a plateau in spite of growth in the population. This is occurring at a time when the health and wellness benefits associated with consistent participation in physical activities is most compelling.



Orange Line Media/Shutterstock.com

**PHOTO 1.1** Exercise equipment is becoming more sophisticated.

Data accumulated on U. S. adults and adolescents over the past couple of decades indicate that:<sup>1</sup>

1. Fifteen percent participate regularly (three times per week for at least 30 minutes) in vigorous physical activities that are not work-related.
2. Twenty-two percent participate regularly (five times per week for at least 30 minutes) in sustained physical activity during nonworking hours.
3. Twenty-five percent engage in no physical activity during nonworking hours.
4. More than 60 percent engage in no exercise or participate sporadically or marginally, so no improvement in health status results.
5. Only half of young people (12 to 21 years of age) participate regularly in vigorous physical activity.
6. One-fourth of young people (12 to 21 years of age) report no participation at all.

A more recent survey by the International Health, Racquet, and Sportsclub Association (IHRSA) adds further evidence about the contradiction that what Americans think about health enhancement and what they actually do to achieve it are

essentially unrelated.<sup>2</sup> The top two priorities of the survey respondents were *maintaining good physical health* and *developing physical appearance*. The respondents rated these two factors higher than having more time for themselves, having good friends, having fulfilling relationships with their significant others, and reducing stress. The emphasis on physical appearance is surprising and ironic, considering that the Centers for Disease Control and Prevention announced findings in 2001 that a record 61 percent of American adults are overweight or obese.<sup>3</sup>

Later information produced by the National Center for Health Statistics showed that obesity continues to increase while overweight remains flat. Almost 67 percent of the adult population is overweight or obese.<sup>4</sup> This assessment also indicated that the number of obese adults (34 percent) has surpassed the number of overweight adults (32.7 percent). Obesity is defined as an excessive amount of body fat, while overweight is defined as carrying too much weight for height regardless of body composition.

Data collected from the initial survey indicated that the respondents were unable to connect participation in exercise and the pursuit of physical fitness as primary vehicles to enhance their health and physical appearance. This may account for their unwillingness to put forth the effort to attain both of these goals.

## Aerobic Exercise and Health

The trend toward exercise began in the 1960s with an emphasis on **aerobic exercise**, also referred to as **cardiorespiratory endurance** activities. The term *aerobic* literally means “with oxygen.” When applied to exercise, it

refers to lower intensity exercises of relatively long duration when the exerciser can supply the oxygen needed to meet the energy demands of the activity. Aerobic exercises are “steady state” or “pay as you go” activities.

For the average healthy person, aerobic endurance can be improved by exercising at a moderate intensity level for 30 minutes per workout on most days of the week. Moderate intensity exercise is defined as the amount of energy expended by walking 3 to 4 miles per hour or any other activity that uses an equivalent amount of energy.<sup>5</sup> Examples of aerobic activities are walking, jogging, stair climbing, cross-country skiing, swimming, rowing, cycling, and sports such as basketball, racquetball, and soccer.

The American Heart Association (AHA) has recognized the importance of physical activity by declaring in 1992 that its opposite, physical inactivity, is a major risk for **cardiovascular diseases**.<sup>6</sup> Further, the AHA stated, “Persons of all ages should include physical activity in a comprehensive program of health promotion and disease prevention.” In 1985, The American Cancer Society began recommending exercise to help people protect themselves from cancer.<sup>7</sup> The endorsements of exercise by prestigious organizations such as these came about because of the weight of research evidence.

## Trends in Fitness and Sports

According to the Sporting Goods Manufacturers Association, 12 percent of the population are classified as “regular” sports participants and 15 percent are classified as “casual participants.”<sup>8</sup> Most American adults do not engage in exercise on a consistent basis.<sup>9</sup> Only 25 percent report

engaging in at least 30 minutes of moderate intensity physical activity on most days of the week. Women are less active than men at all age levels. More than 92 million Americans are infrequent participants in some form of fitness, sports, or recreational activity, and nearly 65 million participate in no physical activity at all.<sup>10</sup>

The percentage of high school students (grades 9–12) who are required to take daily physical education classes has dropped from 42 percent to 29 percent during the last decade.<sup>11</sup> Also, as girls progress through high school, their activity levels drop dramatically. Students who do not participate in fitness activities or sports in high school are more likely to become nonparticipants or sedentary adults.

The elderly are the least active and least fit of all age groups.<sup>12</sup> The aging process is accompanied by a reduction in physical activity. Only 31 percent of people ages 65 to 74 report engaging in moderate intensity physical activity for at least 20 minutes 3 days per week, and even fewer, 16 percent, participate for 30 minutes five days per week. For those who are 75 years of age or older, the rate of participation drops to 23 percent for 20 minutes, and a few engage in physical activity for 30 minutes five days per week. The percentage of the elderly who partake in vigorous physical activities, those that produce heavy sweating and high heart rates, is a dismal 13 percent for those age 45 to 74 and 6 percent for those age 75 or older.

These statistics lead to the conclusion that Americans of all ages are not getting enough exercise to improve their health. The new definition of a sedentary lifestyle does not mean complete inactivity. Those who do not engage in 30 minutes of moderately intense exercise/physical activity at least four to five days per week are

considered to be sedentary.<sup>13</sup> Exercise/physical activities of higher intensity or greater frequency and duration produce even more health benefits.

Despite these dreadful statistics, there is some good news:<sup>14</sup>

1. Walking for fitness attracts 111.7 million enthusiasts.
2. There is an increase in “pick-up” play in team sports that represents a movement away from organized or sanctioned play.
3. Step aerobics, elliptical motion trainers, weight training with dumbbells, and walking for fitness are on the rise.
4. Family-oriented activities such as backpacking, trail running, indoor soccer, cycling, tennis, surfing, racquetball, and volleyball are gaining in popularity.
5. The fastest growing sport in America is tennis, with 48 percent more participants in 2008 compared to 2001.<sup>15</sup>
6. Snow sports such as downhill skiing, cross-country skiing, snowboarding, and snowshoeing are attracting substantially greater numbers.<sup>16</sup>
7. Generation Y (the population born between 1980 to 1994) are engaging in extreme sports such as incline skating, skateboarding, and extreme biking to name but a few.<sup>17</sup>
8. Fifteen to twenty million adults report that they jog or run on a regular basis.<sup>18</sup>

In general, professionals are more active than blue-collar workers in their leisure time. Blue-collar workers as a group, however—particularly those with fewer than 12 years of education—report more on-the-job physical activity than do professionals.<sup>19</sup> The lower-intensity on-the-job expenditure of energy over a 7- to 8-hour day tends to equalize the energy expended by those who participate in structured exercises of higher

intensity for 45 to 60 minutes four to five times per week.

## ACSM and CDC Guidelines

Although physical inactivity is a **risk factor** that crosses all demographic boundaries, the problem is worse for: (a) minority ethnic groups, (b) all people regardless of their ethnicity who are poorly educated, (c) older adults, and (d) people of lower socioeconomic status. **Chronic diseases** such as heart disease, stroke, diabetes, and obesity—all of which respond positively to regular exercise—are most prevalent in these population groups.

Physical inactivity is a risk factor that can be reversed easily and economically. The recommendation for exercise developed jointly by the American College of Sports Medicine (ACSM) and the Centers for Disease Control and Prevention (CDC) for the purpose of health enhancement is that adults should accumulate at least 30 minutes of moderate physical activity over the course of most days (at least four days per week).<sup>20</sup> Scientific research has indicated quite clearly that compliance with this modest level of exercise can improve the health of individuals and, concomitantly, the health of the nation.

Furthermore, exercise does not have to be structured or planned, nor must it include the activities associated most with fitness and health—jogging, cycling, rowing, swimming, and the like. Although vigorous activities such as these provide the most benefit, more moderate physical activities that contribute to better health include, but are not limited to, everyday activities such as mowing the lawn (without a riding mower), gardening, raking leaves, walking,

climbing stairs, and washing and waxing the car.

Exercise in a single continuous session is not necessary. A total of 30 minutes of physical activities broken up into three 10-minute bouts is just as effective for health enhancement as one continuous bout. All activities that require some physical exertion should be approached as opportunities for exercise and a bonus for health enhancement even if they must be sprinkled throughout the day. Intermittent low-intensity physical activity spread throughout the day might not improve one's level of physical fitness measurably, but it nevertheless does burn calories. For example, an office worker who spends 2 minutes an hour to send e-mails to coworkers day after day instead of walking down the hall to speak to them personally would gain the energy equivalent of 11 pounds of fat over a decade. This is a substantial weight gain over time from a tiny amount of energy saved.<sup>21</sup>

Add this to all of the other ways at our disposal for saving energy, and we can see that the problem becomes compounded; in 10 years the weight gain is 30 pounds instead of 11. A Scottish researcher estimates that labor-saving devices that affect home life, recreation, and occupation have reduced average energy expenditures in the United Kingdom by 800 calories per day over the last 25 years.

We all can benefit by adopting the philosophy that substituting our own muscle power for mechanically and electronically powered devices is an idea whose time is well past due. When possible, we should walk or bike instead of driving the car, climb stairs instead of using elevators and escalators, take a 10-minute walk instead of a cup of coffee and a doughnut at breaktime, mow our own lawn instead of hiring someone else to do it, and wash our own car instead of

running it through the car wash. By taking advantage of these and many other opportunities for physical activity, a person surely will look better and feel better as a result.

Multiple studies have shown that moderate levels of exercise performed on a regular basis produce a variety of health benefits including, but not limited to, the following:<sup>22</sup>

1. Lowered risk for developing Type 2 diabetes
2. Reduced risk of incurring many cancers, including breast and colon cancer
3. Improved overall cardiovascular health as a result of increasing the force capabilities and resiliency of the heart muscle and blood vessels
4. Increased level of the only protective form of cholesterol, the high density lipoprotein subfraction (HDL-C)
5. More efficient metabolism
6. Decreased negative states such as depression, anxiety, and stress
7. Improved mental ability and a reduced risk for developing Alzheimer's disease
8. Lower risk for developing osteoporosis

Although moderately intense activities are health-enhancing, they may or may not markedly improve physical fitness. The news is better for those who are willing to exercise vigorously in order to significantly improve their level of physical fitness. A number of studies have shown that the longer people are able to walk or jog during a graded exercise treadmill test, the longer is their life expectancy and the less they are disposed to chronic diseases such as **coronary heart disease** (CHD), cancer, type II diabetes, hypertension, and others.<sup>23</sup> A substantial improvement in physical fitness is reciprocal in that the more fit people become, the more

vigorously they can exercise and the health benefits that accrue are somewhat greater.<sup>24</sup>

## Exercise Programs in Business and Industry

Data that are accumulating from worksite wellness programs have provided more ammunition for the physically active life. Many of these programs have been in place long enough to have an impact on employee health. As they attempt to contain the spiraling costs of health care, companies that have invested in worksite health-promotion programs are saving more dollars than they spent initially.

Translating preventive practices into changes in health status takes time and consistent effort. An educational component is necessary to change longstanding behavior patterns such as cigarette smoking, poor nutritional practices, and sedentary living. Time and a sincere commitment are required to control blood pressure and serum levels of cholesterol through lifestyle changes instead of medications.

Data coming from worksite health-promotion programs are encouraging. Companies are discovering that healthcare costs are lower, worker absenteeism is down, employee productivity is up, and on-the-job accidents are fewer.<sup>25</sup> Health-promotion programs with physical fitness opportunities either on-site or paid for (partially or fully) by the company are perks to recruit and keep key personnel.

The worksite has great potential for adults to engage in regular physical exercise. In fact, the goals established for worksite fitness programs in *Healthy People 2000*—a national study in which thousands of

health professionals contributed to the development of specific national objectives—were exceeded. The more recent *Healthy People 2010* objectives have set worksite fitness goals higher with the expectation that these, too, will be met and exceeded.<sup>26</sup>

The cost of initiating and operating a worksite physical fitness program usually can be recovered within a few years. The economic benefits that accrue from quality fitness programs surpass the costs to the company. According to the Department of Health and Human Services, the savings from worksite wellness programs ranges from \$1.65 to \$4.91 for every dollar spent.<sup>27</sup> Substantial evidence indicates that a healthier workforce delivers improved performance while consistently lowering health care costs. The latter costs include, among others, professional leadership, facilities, equipment, marketing, and promotion.

## The Costs of Sedentary Living

Exercise of moderate intensity, performed consistently, reduces all-cause mortality, increases longevity, and delays or reduces the likelihood of incurring chronic diseases.<sup>28</sup> The most active and most physically fit people have death rates from all causes that are 25 percent to 50 percent lower than those who are least active or least fit.<sup>29</sup> A low level of fitness is one of the most potent risk factors for death from all causes in males, and it is almost as risky as smoking cigarettes.<sup>30</sup> Many of the deaths associated with physical inactivity are premature. The number of lives lost because of inactivity and poor diet is approximately 300,000 a year.<sup>31</sup> This represents about 12 percent of deaths annually in the United States. Most of these deaths result from coronary

heart disease or medical problems such as diabetes and obesity that significantly contribute to CHD.<sup>32</sup> The Johns Hopkins medical editors stated that “when combined with a poor diet, physical inactivity is the second most significant underlying cause of death in the U. S.”<sup>33</sup>

Further, exercising regularly delays or reduces the likelihood of succumbing to one or more of the chronic diseases. As a result, active people place less demand on the nation’s medical delivery system, and they are more productive occupationally. Conversely, those who choose to lead sedentary lives impose on others the costs associated with their lifestyle.

The financial cost to others (referred to as “external costs”) by those who are physically inactive results from payments they receive from collectively financed programs such as health insurance, sick-leave payments, disability insurance, and group life insurance.<sup>34</sup> To finance these programs, active people pay the same premiums and payroll taxes as the sedentary people who are the most frequent users. These programs do not distinguish frequency of utilization, nor do they provide discounts for positive health behaviors. Therefore, they essentially function as social welfare programs that subsidize unhealthy behaviors.

When sedentary people gravitate to an active way of life, everyone benefits. Data from the highly respected Framingham Heart Study indicated that people who walked 30 minutes per day lived on average 1.3 to 1.5 years longer than people who were less active.<sup>35</sup> Those who exercised more intensely, jogging 30 minutes per day, extended their lives by approximately 3.5 to 3.7 years. The impact of exercise on longevity may also be expressed in this manner: for every minute spent exercising, longevity increased by two minutes.<sup>36</sup>

## Disease and Death Patterns

The fitness movement developed largely as a reaction to innovations in medicine, science, and technology and their relationship to the changing patterns of disease and death patterns in the United States. **Communicable diseases** (tuberculosis, pneumonia, typhoid fever, smallpox, scarlet fever, and others) were the leading causes of death during the early years of the twentieth century.

Advances in medical science have virtually eradicated these maladies and threats to life, but they have been replaced by chronic **degenerative diseases** such as heart disease, stroke, cancer, diabetes, and the like. This group of diseases, largely lifestyle-induced, has reached epidemic proportions. Many authorities refer to these diseases as voluntary or self-inflicted, thereby emphasizing the influence of negative choices and unhealthy behaviors on the development and course of these diseases.

Approximately 58,000,000 people in the United States have one or more forms of cardiovascular disease.<sup>37</sup> Cardiovascular diseases accounts for approximately 27 percent of all deaths in the United States, about 864,000 deaths annually. About half of these deaths (464,000) are the result of coronary heart disease. Although most Americans are aware of this type of heart disease, most people don’t fully understand the behaviors necessary to prevent or delay it. The Framingham Heart Study—a landmark study of heart disease—identified the risk factors connected with heart disease. This ongoing study began in 1949 and continues to this day, turning out valuable information from the subjects they began studying decades ago.

As risk factors were identified, the realization evolved that heart disease

was not the inevitable consequence of aging but, instead, an acquired disease that is potentially preventable. Cigarette smoking, high blood pressure, elevated levels of blood fats, diabetes, overweight, stress, lack of exercise, and a family history of heart disease were found to be highly related to heart attack and stroke. Most of these risk factors can be modified by the way we live.

Within our control are opportunities to choose what to eat and how much, whether to smoke cigarettes, whether to exercise, and how to control stress. We can choose when to be screened for blood pressure and blood fats, and we can choose whether to act upon that information. During the last four decades, millions of Americans have changed their eating, smoking, and exercise habits. Consequently, deaths from cardiovascular disease declined by approximately 51 percent during this time.<sup>38</sup> Even though other factors are involved in this favorable trend, modifications in lifestyle have made a significant contribution.

Life today is considerably different from life in the early 1900s. Scientific and technological advances have made us functionally mechanized. Labor-saving devices proliferate in all facets of life—occupation, home life, and leisure-time pursuits—and always with the promise of more and better to come. Each new invention has helped to foster a receptive attitude toward a life of ease, and we have become accustomed to the easy way of doing things. The mechanized way is usually the most expedient way, and in our time-oriented society, this has become another stimulus to indulge in the sedentary lifestyle.

Today, exercise for fitness is programmed into our lives as an entity separate from our other functions. In contrast, the energy expenditures of our forebears were integrated into their work, play, and home life.

Physical fitness was necessary, and fit people were the rule rather than the exception. Tilling the soil, digging ditches, and working in factories were physically demanding jobs. Lumberjack contests and square dances were vigorous leisure pursuits. Being a wife and taking care of home and family required long hours doing arduous tasks. In the early years of the twentieth century, one-third of the energy for operating factories came from muscle power. By 1970, this figure had dropped to less than 1 percent, reflecting the declining energy demand of our jobs.

The turn of the twentieth century found 70 percent of the population working long, hard hours to produce food. Children of this era walked several miles to school and did chores when they returned home. Today, only 3 percent of the population, using highly mechanized equipment, are involved in the production of food, and their children ride in motor vehicles to school. Adults drive to the store, circle the parking lot to get as close as possible to the entrance, and ride elevators and escalators while there. We mow the lawn with a riding mower, rely on a cart when we play golf, wash dishes and clothes in appropriate appliances, change television channels with a remote control, and open garage doors in the same manner.

These are simply observations of life in the United States. This is not to imply that the fruits of science and technology should be repudiated but, rather, that the results and their impact upon us be viewed in perspective and acted upon accordingly. Inventions of the Industrial Age have significantly reduced the level of physical activity required to earn a living. Machines and automation have taken much of the physical labor out of our occupations. And now we find ourselves moving at the speed of light into the Information

Age, with its potential for further reducing the need for physical activity. Cell phones, faxes, electronic mail, and the proliferation of computers for business and home have changed the way we do business and access information—and all of this is accomplished while we sit down.<sup>39</sup>

The leisure-time activities of young people 10 to 17 years of age also have changed. Computerized games, video games, and television watching have replaced more active leisure-time games and activities. These sedentary pursuits seem to be contributing to the rise in obesity in this age group in the United States today. One study found that at least 25 percent of U. S. children spend 4 hours or more viewing television daily.<sup>40</sup> Reducing TV viewing time by just 3 hours per week and converting those hours to moderately intense physical activity would improve physical fitness and health status for this age group.

Futurists of the 1960s predicted that technology would take over many of the laborious tasks in the workplace as well as the home. The result of all of this would be a substantial reduction in the time required to earn a living and to manage the household, leaving us with an abundance of free time. Obviously this prediction was off the mark and has not materialized for much of the population. At that time, the expectation was that the new technology would enable the workforce to do the work in less time, and this ultimately would lead to a four-day workweek.

In reality, the new technology enabled U. S. workers to do more work in the same amount of time, thereby increasing productivity while expending less energy. As corporations have downsized, fewer workers using modern technology and working longer hours are more productive than the full workforce used to be.

## Managing Time

All of the changes over the past century have made it difficult to find time to schedule exercise. Effective management of time is becoming more important as we attempt to balance work, leisure activity, and sleep in a 24-hour day. To commit the time and effort required to exercise consistently, we must understand its relevance to a healthy life.

Effective time managers are skilled in identifying and prioritizing goals. They identify the ultimate objective and then set realistic short-term goals that are attainable with sustained effort. The goals that are established should be specific to allow evaluation of progress. Finally, goals should be accompanied by a timeline for accomplishments.

Wise time managers use a variety of tools to help them accomplish their daily tasks. For example, many people generate a list of things to do for each day. They carry the list with them on a 3 × 5 index card or pocket-size notebook and cross off the tasks as they are completed during the day.

Another useful tool is a weekly or monthly calendar containing the fixed items that remain the same every week, such as classes, work, meals, and meetings. Also included are important nonfixed items such as tests, due dates for written and oral assignments, and vacation. Filling out a calendar like this indicates pockets of time available for physical activity, study, and other pursuits. When total time is examined systematically, it is surprising how much time is left over.

As important as time availability is, people still must be motivated to use it constructively. A national survey conducted among “less active” Americans indicated that 84 percent watched television a minimum of 3 hours per week.<sup>41</sup> This suggests that they have leisure time available but would rather watch television than

participate in physical activity. Television viewing is running into stiff competition from another sedentary pursuit—the home computer—and this is compounding the difficulty of finding time for physical activities.

## Rationale for Choosing Walking and Jogging

Although people have inhabited the Earth for many centuries, only during the last 75 years have such drastic changes in lifestyle been generated. At the same time, our basic need for physical activity has not changed. Our bodies were constructed for, and thrive on, physical work, but we find ourselves thrust into the automobile, television, and sofa age, and we simply have not had enough time to adapt to this new, sedentary way of living. Perhaps 100,000 years from now the sedentary life will be the healthy life. At this stage of our development, though, the law of use and disuse continues to prevail: That which is used becomes stronger, and that which is not used becomes weaker. For simple verification of this physiological principle, witness a leg removed from a cast after eight weeks and note the atrophy of the limb.

Many people, myself included, believe that our new ways of living are precipitating, or at least significantly contributing to, the diseases that are affecting modern affluent humankind. These ways of living are unique to highly industrialized nations. By contrast, the underdeveloped nations, with their different lifestyles, do not experience this phenomenon to the same extent.

Before developing or engaging in any form of physical exercise program, beginners should determine what their expectations are. What

goals, both short- and long-term, do you wish to achieve? Identifying goals will guide you regarding how hard, how often, how long, and what activities will comprise your exercise program. Once you resolve these questions, you can tailor the program to meet your specific objectives. If you follow through, you will have a high probability of success.

The choice to walk, jog, or combine the two as the activity mode by which to attain health and fitness objectives has a significant base of support in research. Both activities are effective and popular.

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*Identifying goals will guide you regarding how hard, how often, how long, and what activities will comprise your exercise program.*

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## Walking

For human beings, walking is the natural form of locomotion. It is a low-risk, low-impact activity that can be done almost anywhere, by almost anybody (including many who have disabilities), in most environments, and within a reasonable timeframe.

Walking uses a heel-to-toe motion so the foot strike at landing is at the heel and the push-off is at the end of the big toe. This action dissipates the force of impact with the ground over the widest possible foot area. The foot rolling forward generates horizontal momentum for forward movement. The advancing foot lands before the rear foot leaves the ground, ensuring that one foot is always in contact with the ground. Forward motion of this type minimizes the impact of landing.

For beginners, walking is an effective introduction to physical activity. Walking can be manipulated to meet a variety of objectives. In addition to being an entry point into exercise, it