



SIXTH
EDITION

FITNESS FOR LIFE

AN INDIVIDUALIZED APPROACH

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**McGraw-Hill WCB
McGraw-Hill**

Boston, Massachusetts Burr Ridge, Illinois Dubuque, Iowa
Madison, Wisconsin New York, New York San Francisco, California St. Louis, Missouri

WCB/McGraw-Hill

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Fitness For Life

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This book is printed on acid-free paper.

18 19 20 QPD 9 8 7 6 5 4 3 2

ISBN 0-697-23329-4

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Attempting to reach the goal of physical fitness can be compared with preparing to take a journey. If you were driving from Los Angeles to New York City, you would first obtain a road map in order to determine the route to follow. The journey to physical fitness is very similar, but most people are not familiar with, or do not know where to obtain, a road map to fitness.

Fitness for Life: An Individualized Approach is intended to provide such a road map. It takes people from their current levels of fitness toward increased cardiovascular endurance, proper weight control, increased strength and flexibility, and the ability to relax.

Approach

The individualized approach to physical fitness in this program is designed to do more than teach the principles of cardiovascular endurance, nutrition and weight control, strength, flexibility, and relaxation. Individuals also apply what they learn by writing and engaging in their own personalized fitness programs.

Too often people are placed in a required physical fitness program where all of the decisions are made for them by the instructor. When people leave such an organized program, they are unable to carry on the program by themselves, and they start on the road to poor physical fitness. We are convinced that it is possible to teach correct principles of physical fitness. These principles can be utilized every day to make the right choices and decisions that will enable people to become and remain physically fit for their entire lives.

The *Fitness for Life* program consists of three major stages. First is the **physical fitness**

appraisal, second is the **writing of an individualized fitness program**, and third is the **signing of a contract and the fulfilling of the fitness contract**.

Appraisal Tests

The fitness appraisal tests selected for the *Fitness for Life* program are simple to administer and do not require a lot of expensive testing equipment. These tests allow the students to have the means to test themselves and others when they leave the university setting.

Physical fitness appraisals in *Fitness for Life* are based on the following:

Cardiovascular endurance The time spent in running the 1.5 mile run or the time needed to walk 3 miles is used to assign the student to a selected cardiovascular endurance fitness category.

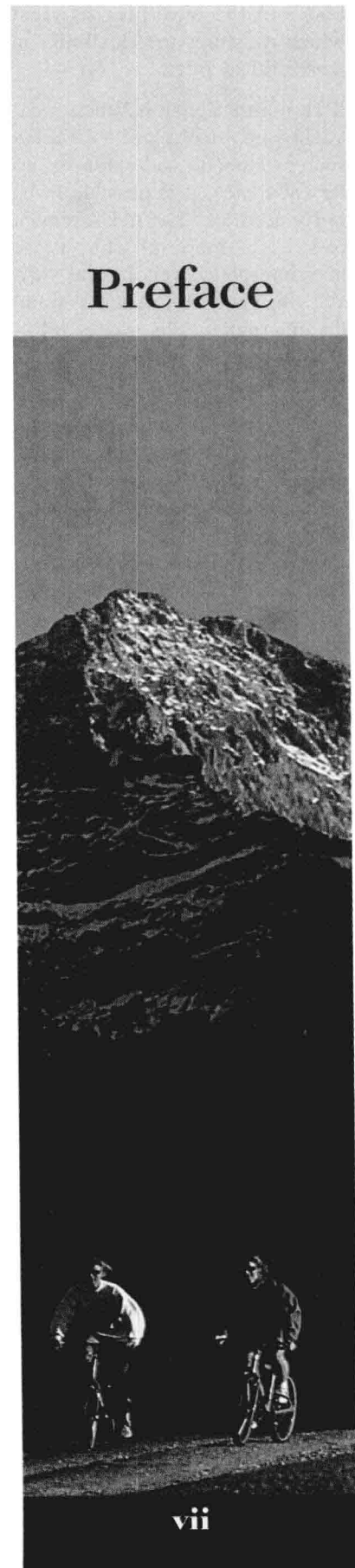
Body Composition The individual's body composition is determined by skinfold measurements. In addition, the student is also taught how to determine body composition using body measurements. From the body composition measures, the student is now able to determine an estimated target weight for any selected percent body fat.

Strength Six strength tests are performed to determine strength ratings for various body parts and an overall strength rating is computed from the test results.

Flexibility Lower-back pain is prevalent among men and women and this is generally related to a lack of flexibility in the lower back, hips, and the backs of the legs. Another area of the body that also suffers from a lack of flexibility is the upper torso.

The flexibility tests selected to be used in the *Fitness for Life* program are the sit-and-reach

Preface



test and the shoulder lift test which measures the flexibility in these critical areas.

Stress and Tension When measuring physiological variables such as strength and cardiovascular endurance, it is possible to be fairly accurate. The measurement of stress is more difficult, as we may interpret psychological variables in many different ways and this interpretation is greatly influenced by our different backgrounds and moods.

The test selected for the *Fitness for Life* program was developed by the Public Health Service of the Department of Health and Human Services.

This is a four-part test. The first three parts are designed to give an indication of how vulnerable you might be to certain types of stress and to make you aware of how they might affect you. The last part of the test provides you with information on how to cope with situations that might be of a stressful nature.

Writing Physical Fitness Programs

Based on the appraisal test results, individualized exercise regimens are written for each of the physical fitness components. A student is able to select from a wide variety of activities and uses the step-by-step worksheets to write a personalized prescription of activity that is easy to understand and to follow.

Fitness Contract

After writing the fitness program, the student fills out a contract and has it approved and signed by the course instructor. The reason for having a contract is that it has been found that by involving someone else, people are more likely to continue engaging in their fitness programs.

The students are now ready to begin their fitness programs. They are not required to exercise during a specific class period, as you may have 60 students engaging in 15 different activities. Also personal preference determines the time of day one may want to exercise. The student not only selects the activities to engage in but also the time of day to exercise.

The student is required to fill out an exercise log to help in keeping an accurate account of the exercise completed. Periodically they meet with the instructor to have the log signed.

After five weeks of activity the student retakes the appraisal tests. It has been found that this is a positive motivator because of the improvement made in the various fitness components. At the end of the semester the student takes the appraisal tests for a third time.

The student meets individually at the end of the semester with the instructor to have the fitness contract signed for completing the course requirements and to determine the final grade.

Grading

The grade for Fitness for Life can be determined by the student's ability to complete written exams which indicate the knowledge to understand fitness concepts and write physical fitness programs. In addition, a person's physical fitness achievement and contract completion can be computed into the final grade.

An A, B, Pass, Fail system is utilized for grading. By allowing a student to select a Pass grade, their grade point average is not affected as a Pass grade is not computed into the GPA.

Program Results

The important question about any physical fitness program is, does

it work? The material in the *Fitness for Life* program has been used and evaluated in a "class-testing" situation involving thousands of students at Brigham Young University and other schools. The research indicates that the program brings about significant gains in strength, flexibility, and cardiovascular endurance, and significant decreases in percent body fat.

Research has also been completed concerning the psychological affect and compliance to exercise after leaving the program. A highly important result was that after a three-year period, 84 percent of the students who have taken the class were still exercising. In addition, it has been found that after the students leave the university setting they still have the ability to write and engage in personalized physical fitness programs.

Physical fitness is an ongoing endeavor for a lifetime. By using the information contained in the *Fitness for Life* program, your students will be able to write fitness programs for themselves and for others.

New to This Edition

This sixth edition of *Fitness for Life* features the following changes:

- Chapter 1 now includes a summary of the recent report from U.S. Centers for Disease Control/ACSM workshop on physical activity and public health regarding low percent of adults engaged in physical activity.
- PARQ You has been added to other evaluations of basic medical readiness in Chapter 2. Students can choose from several evaluations and find the one that best suits their needs.

- In Chapter 5, the nutrition coverage includes explanation of the food pyramid, reading the new food labels, balancing diet, and a fat budget table. Students learn to apply these four elements to develop their own diet/menu and create a prescription for nutrition, much the same way a physician uses his/her knowledge to write a prescription.
- More attention has been given to specific methods for improving fitness.
- Throughout the text, greater emphasis is given to “why” specific activities are beneficial.
- New references provide students with up-to-date information on personal fitness and wellness.

Supplementary Materials

Instructor’s Manual

The Instructor’s Manual available with *Fitness for Life* offers variable approaches to instruction, a variety of course schedules, a course overview, helpful hints on administering and grading fitness tests, and a test item file of evaluation questions.

MicroTest III

MicroTest III is a computerized system that enables you to make up customized exams quickly and easily. Test questions can be found in the Test Item File, which is printed in your instructor’s manual or as a separate packet.

The package you receive will contain complete instructions for making up an exam and using our call-in testing service.

Profile Disk

The profile disk available with *Fitness for Life* can be used for Macintosh and IBM-compatible computers. This program allows you to construct a personal fitness appraisal profile from individual data input concerning cardiovascular endurance, body composition and recommended body weight, strength, and flexibility. Based on the fitness appraisal, the program can then personalize a cardiovascular endurance, nutrition and weight-control, strength, and flexibility program for the student.

Audiovisual Presentations

The audiovisual presentations are a series of fourteen lessons for the various fitness programs associated with the *Fitness for Life* program. This is a service available free to qualifying adopters of *Fitness for Life*.

These presentations can be utilized as classroom lectures or made available to students who have questions and need to review any material covered in the textbook.

List of Reviewers

We gratefully acknowledge the invaluable assistance of the following reviewers in the development and preparation of the text:

Steve Dzubinski
Brandon University

Shelly Jefferies
*California State
University–Northridge*

Christian Johnson
Azuza Pacific University

Sylvan Lawson
Austin College

Michael S. Manley
Anderson University

F. Eric Sills, Ph.D.
Eastern College

Dr. “Sandy” Streater
*Health Science–Armstrong State
College*

Acknowledgments

The textbook plan and the material included in it are the result of many hours of work and the help of many people. We are grateful to our colleagues at Brigham Young University for their support throughout the book’s development.

We wish to thank K. C. Cline, Loxley Walters, and Lance Marshall, who served as models for the exercise photographs. Thanks are also given to Walter Cryer who was the photographer for all of the photographs in this new edition.

Special thanks are given to Carol Wilkinson for her great contribution in the producing of the audiovisual presentations for this edition. We extend our thanks to the Division of Instructional Research, Development, and Evaluation at Brigham Young for helping us put together what we feel is a concise and instructionally sound program for physical fitness.

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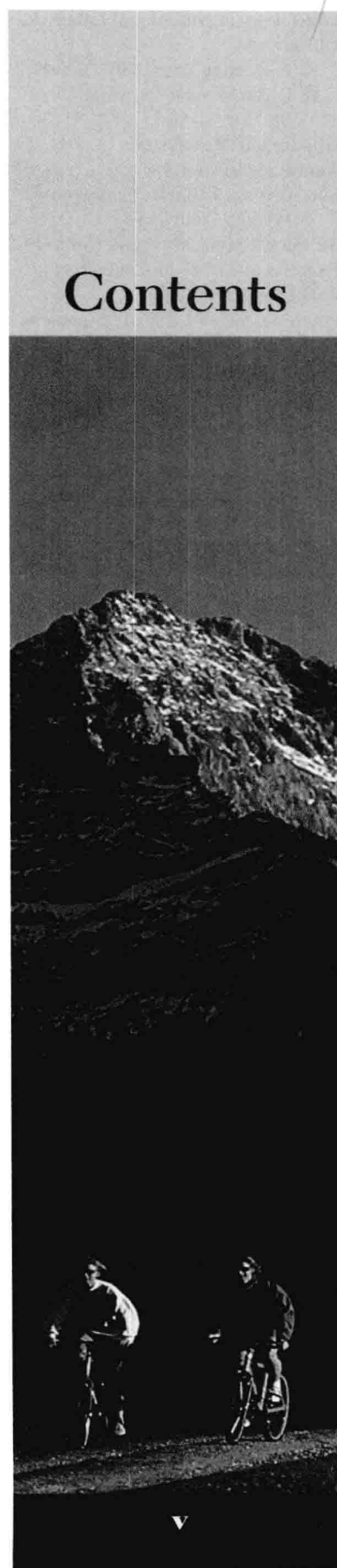
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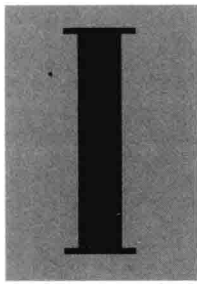
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Introduction to Fitness for Life

Objectives

After studying this chapter
you should be able to

1. understand the need for physical fitness;
2. correctly define physical fitness;
3. know the effects of a healthy life-style;
4. understand the specific objectives for physical fitness.



It was a beautiful spring day in Centerville. The sun was shining, a light breeze was blowing, and excitement was in the air. It had been a long, cold winter, and this was one of those beautiful sunny spring days, just right for the first high school track meet of the year.

There was a special excitement for the Mason family because Johnny, who was in his first year of high school, was running the high hurdles. The whole family was there to watch him.

Johnny's father, Ed, had been one of the best high hurdlers in that part of the country. He won the high school state championship when he was at Centerville High. He had beaten everyone in the state, even the hurdlers from the big city high schools. Ed went to college on a track scholarship and won the conference championship in the high hurdles.

After college, he returned to Centerville, married, and took a job at the bank. Now, many years later, his oldest son was going to run the high hurdles in competition for the first time. Ed had let the coach do the coaching, so he had never seen Johnny run.

In the high hurdle event, Johnny finished in third place behind two seniors, one from his school and one from the opponent's school. It was not a bad showing for his first time. But Ed, watching the race, knew how Johnny could have run a better race and perhaps could have won. He decided to give Johnny some lessons after the meet.

As soon as the last race had ended, Ed went down on the track and found Johnny. He tried to explain a better way to clear the hurdles but Johnny did not understand. Caught up in the excitement of the day, Ed decided to show Johnny what he meant.

With a job and a family, Ed had not kept up his track training schedule after college. Instead he had been playing golf every Saturday morning hoping to keep in shape.

As he came out of the blocks, his stride did not quite live up to his memory, but it wasn't too bad for a man his age. Then, as he tried to clear the first hurdle, his back leg caught on the hurdle and tripped him. He slid face first along the track, breaking his glasses and cutting himself from head to toe. There was total silence. What could he say? What could anyone say? Ed Mason was not what he used to be, but what a way to find out.

This incident was told to the authors by a former graduate student, Jim Hesson. As Jim pointed out, if Ed had continued a fitness training program, he either would have been able to run the hurdles or would

have known that he could not run the hurdles. In this case, however, he was totally unaware of what his body could and could not do.

In the United States, we live in an age of disposable products and containers. There are bottles, cans, and cartons for nearly everything. We use the contents, then throw away the containers. This has become such an acceptable practice in our lives that we often do the same thing with people—including our athletes. You don't believe it? Think about it. What do we do for our athletes after the last basket is made and the last race is run? Do we provide them with a sound fitness program so that they can maintain a high level of fitness and health for the rest of their lives? The answer in most cases is *no*!

The primary reason that this happens is that most of us, including athletes, have never been taught how to be responsible for our own physical fitness. After the competition ends, there may be a handshake and a wish for "good luck in the big world," but that is the end of physical activity. The next time activity is considered is after the first heart attack at the age of forty.

Thus, there is a great need for a personalized fitness program for people of all ages. It should be one that is not based on competition where only one person or one team can emerge victorious, but a program in which everyone can be a winner. The program should be the type from which a person can select many activities as dictated by personal needs and likes.

The ordinary tasks of daily living no longer provide individuals with enough vigorous exercise to develop and maintain good muscle tone, recommended body weight, or cardiovascular fitness. Yesterday's man and woman were engaged in a constant hand-to-hand combat with the environment, and our ancestors needed a strong body just to stay alive. Their typical day consisted of 12 to 14 hours of hard labor. We have the same kind of body as that created for ancient people—one designed for physical activity. Unfortunately our world no longer demands fitness, and inactivity, together with poor personal health practices on the part of many Americans, has resulted in a massive national physical fitness problem.

In homes, factories, and farms, machines now supply the power for most jobs. They have virtually eliminated the necessity of walking, running, lifting, or climbing. One modern machine—television—holds people in captive idleness for an average of 21 hours a week.

It has been estimated that children spend more time in front of the television set than they spend in school. Research conducted at Tufts University and Harvard Medical School examined the relationship between excess body fat in children and the amount of

television they watch. The results revealed that the more television watched, the greater the amount of body fat. It was also found that the earlier a person begins to watch television, the greater the problem. When more than two thousand children were followed into adolescence, it was discovered that the children who watched the most television at a younger age had the greatest amount of fat as teenagers.

It has been stated that watching television not only requires no skills, it develops no skills. No one can get better at watching television by watching more of it.

A workshop sponsored by the U.S. Centers for Disease Control and Prevention and the American College of Sports Medicine issued a summary statement on physical activity and public health that stated that despite the recognized value of physical activity, few people are regularly active. In the United States, it was estimated that only 22 percent of adults engage in leisure-time physical activity at the level recommended for health benefits. Fully 24 percent of adult people are completely sedentary and are badly in need of more physical activity. The remaining 54 percent are inadequately active and they too would benefit from more physical activity. Participation in regular physical activity appears to have gradually increased during the 1960s, 1970s, and early 1980s, but has plateaued in recent years. Among ethnic minority populations, older persons, and those with lower incomes or levels of education, participation in regular physical activity has remained consistently low.

A study of children ages 6 through 17 conducted by the Institute of Social Research of the University of Michigan indicated that the physical fitness of American public school children hasn't shown an improvement in the last 10 years and, in some cases, has greatly deteriorated.

Similar results were found in another study conducted by the Institute for Aerobics Research in Dallas, Texas. This study indicated that today's students generally have more body fat and perform more poorly in cardiovascular endurance events than students in the past. Only 17 states have mandatory physical education classes and only 36.3 percent of students in grades 5 to 12 take physical education classes on a daily basis.

Dr. Kenneth Cooper, director of the institute, stated, "It's discouraging and I'm afraid that as these kids grow up, we will see all the gains made against heart disease in the last 20 years wiped out in the next 20 years."

Many people are older than their years would indicate. Dr. Thomas Cureton, outstanding researcher in exercise at the University of Illinois, states that

middle age for the average person begins at age 26, because at that age he or she has the physical capacity that our ancestors had when they were 40. By the time we are 65, we are told to retire and we think we have to take it easy, but what we really need is exercise.

Two amazing stories concerning exercise are those of Eula Weaver in California and Edson Sower in Arizona.

At the age of 67, Eula had a severe heart attack. She survived but, at age 75, she was hospitalized with congestive heart failure, arthritis, high blood pressure, angina, atherosclerosis, and claudication. Claudication is a condition that prevents adequate blood flow in the extremities. Eula could walk only about 100 feet and wore gloves in the summer for warmth. She also was taking 15 to 20 pills a day for all of her ailments.

At the age of 81, she began a special diet and exercise program. It started out with walking and then progressed to a jogging and running regime. When she was 85, Eula won two gold medals in the Senior Olympics in the 880 and mile run! She repeated these gold medals at age 86 and 87. She ran one to two miles daily and also rode a stationary bike each day. Eula is living proof that we are never too old or too out of shape to accomplish something with our bodies.

Edson Sower of Arizona began running at age 60 to improve his health. He began by running only a quarter of a mile a day and gradually increased the distance. Edson is now 80 years of age and has run more than 40 marathons—a marathon is more than 26 miles—and many ultra-marathons. He competed in and won the Iron Man titles for his age in the Hawaii and Canada triathlons, which include a 2½-mile swim, a 112-mile bike ride, and a marathon. He broke the world record for his age group by running 63 continuous miles in 24 hours. When asked his secret, his answer was, "My secret? I never give up!"

Seneca's adage, "Man does not die, he kills himself," is more true now than when the words were written nineteen centuries ago. Medical science has conquered the diseases of former times, such as diphtheria, influenza, polio, and tuberculosis. Today our lives are far more likely to be imperiled by our own conduct: by smoking, alcohol, fatty foods, obesity, and lack of exercise. For this reason, heart disease and lung cancer are sometimes referred to as "diseases of choice." The gravity of America's physical fitness problem can be gauged by the following facts and figures:

1. Although deaths from coronary heart disease have declined since 1970, it still remains the leading cause of death in the United States and

other so-called developed countries. More than twice as many people die from heart disease as from cancer. Heart attacks alone cost industry more than 132 million workdays annually, which reduces the gross national product and results in a loss of output by those who are stricken. Thousands of people, many of them at the pinnacle of their value to the companies employing them, will die of heart attacks this year. Many people think that heart disease is an old person's problem, but nothing could be farther from the truth. A study conducted during the Korean and Vietnam conflicts revealed that approximately 70 percent of the 22-year-old or younger servicemen killed had the beginning stages of atherosclerosis. A study of 8- to 12-year-old children in California found that 37 percent were obese, 20 percent had increased blood cholesterol levels, 8 percent had increased blood fat levels, and some were even showing indications of abnormal electrocardiograms. We start to develop heart disease at an early age and it reaps its toll of death as we become older.

2. Obesity is a major health hazard. If all deaths from cancer could be eliminated, two years would be added to a person's life span. If all deaths related to obesity could be prevented, it is estimated that the life span would increase seven years! Some authorities indicate that life expectancy decreases approximately 1 percent for each pound of excess fat carried by an individual between the ages of 45 and 50.
3. The common backache, far less dramatic than a heart attack, is usually a result of physical degeneration. Once again, the price is high. According to the National Safety Council, backache costs American industry \$1 billion annually in lost goods and services and another \$225 million in worker's compensation.

Dr. Lawrence Friedmann, head of rehabilitation medicine at the Nassau County Medical Center, indicates that most backache cases result from "either inelastic muscles or weak muscles." One study in two New York hospitals found that 81 percent of the patients with back pain had no underlying organ problems such as damaged vertebrae, ruptured discs, or arthritis.

4. Chronic tiredness is one of the frequently heard complaints of modern life. In many people, this is the result of the body's gradual deterioration due to a lack of physical activity. It is known that continual inactivity results in a loss of muscle

tissue, which causes an individual to lose the strength and endurance to do daily tasks with ease and efficiency.

5. In the past few years a new term has been coined to describe the effects of inactivity. "**Hypokinetic disease**" is the term given to a disease that is related to, or caused by, a lack of regular physical activity. Such diseases as coronary heart disease, high blood pressure, lower-back problems, increased body fat, and joint disorders are some of the so-called hypokinetic diseases.
6. The stress of modern-day living has brought about an increase in two undesirable psychological states known as "anxiety" and "depression." **Anxiety**, or the feeling of uncertainty and apprehension, can bring about confusion and distorted perceptions that can interfere with thinking and other normal mental processes. **Depression** is associated with feelings of hopelessness and a reduction of the mental processes and other body functions. Some experts in the field of mental health estimate that more than 50 percent of all patients who are in hospitals because of emotional illness are suffering from various depressive disorders. It is reported by some medical doctors that approximately 70 percent of the pseudo-physical ailments in patients are illnesses that have an origin in emotional causes.
7. One of every six children in the United States is so weak, uncoordinated, or generally inept that he or she is classified as physically underdeveloped by the standards of the President's Council on Physical Fitness and Sports. Such a child is likely to become a sedentary adult with all of the added health risks associated with poor physical fitness.

In 1990 the U.S. Public Health Service released a broad-based strategy to improve the health of all people in the United States. It is titled *Healthy People 2000*. National health promotion and disease prevention are listed as objectives to be reached by the year 2000. These objectives focus on improving health status, reducing health risks, and providing and improving services that will increase the scope, quality, and accessibility of these services to the American public.

As a result of these strategies it is hoped that three broad national goals can be achieved. These are:

1. increase the span of healthy life for Americans
2. reduce health disparities among Americans
3. achieve access to preventive services for all Americans

Integral to obtaining these objectives is the relationship between physical fitness and health. To achieve the *Healthy People 2000* objectives, it is recommended that the American public

1. increase daily physical activity;
2. increase cardiorespiratory fitness;
3. increase muscular strength, endurance, and flexibility;
4. improve dietary composition;
5. reduce prevalence of overfatness; and
6. reduce coronary heart disease deaths.

To accomplish these goals, physical activity must become part of regular behavioral patterns.

What Is Physical Fitness?

Physical fitness means different things to different people. The American Alliance for Health, Physical Education, Recreation, and Dance and the President's Council on Physical Fitness and Sports report that physical fitness is a state of physical well-being with attributes that contribute to: (1) performing daily activities with vigor; (2) having minimal risk of health problems that are related to lack of exercise; and (3) providing a fitness base for participation in a variety of physical activities.

In more meaningful personal terms, it is a reflection of the ability to work with vigor and pleasure without undue fatigue, with energy left for enjoying hobbies and recreational activities, and for meeting unforeseen emergencies. It relates to how you feel mentally as well as physically. Physical fitness is many-faceted. Basic to it are proper nutrition, adequate rest and relaxation, good health practices, and good medical and dental care. But these are not enough. An essential element of fitness is physical activity—exercise for a body that needs it.

Both physical activity and physical fitness are capable of contributing to good health and longevity. Physical activity may be viewed as a process that contributes to physical fitness, which might be classified as a condition. People do not choose between physical activity or physical fitness. The important concept to remember is that both variables are intertwined and that the ultimate goal is to achieve a life-style that will increase the quality of life.

An important question that needs to be answered is, Why are so many people inactive? One reason is that in the past the emphasis has been on high-intensity physical activity. The old adage of "No pain, no gain" is certainly very familiar to most people, but

selling people on the idea of pain as an outcome or product is not very easy. Many people may drop out or reject a program of this type and become inactive.

We want to emphasize that many positive health related benefits can be achieved with regular moderate-intensity physical activity. An exact definition of moderate activity is not universally accepted, but the American College of Sports Medicine and the American Heart Association in 1990 defined moderate activity as 60 percent to 79 percent of maximum heart rate. The United States Centers for Disease Control and Prevention and the American College of Sports Medicine defined moderate activity as exercise requiring four to seven calories per minute as the borderline. The time spent in moderate activity should add up to an energy expenditure of 700 calories per week to achieve the minimum conditioning and health benefits and add up to 2,000 calories per week for maximum health benefits. The physical activity should be performed on three or more nonconsecutive days.

A relationship between exercise duration and intensity may exist, in which low-intensity exercise requires more time to bring about changes in functional capacity when compared to exercise of higher intensity. From a health and conditioning viewpoint, the major advantage of low or moderate activity is less chance of any complications, whereas vigorous exercise gives you the advantage of accomplishing health and fitness benefits in a shorter period of time.

Using the benefits of physical fitness as guidelines, we concluded that the evidence of research indicates that physical fitness is built on a foundation of six major factors—cardiovascular endurance, strength, flexibility, nutrition, proper body weight and body composition, and relaxation. If these objectives can be accomplished, a person is well on the way to achieving optimal physical fitness. By achieving physical fitness, an individual can engage in a life-style that produces health and happiness.

What Do You Know About Exercise?

Now that we have come to a common definition of physical fitness, let me ask you the question, "What do you really know about exercise?" Bill Maness, editor of the *Aviation Medical Bulletin*, has prepared a quiz that determines what one knows about fitness. This information helps separate truth from fallacy and removes some of the confusion from the burgeoning world of exercise advice.

1. The best way to reduce the midsection is to do abdominal exercises. (true or false)

The statement would appear to be true. Many people believe that when certain muscles are exercised, the fatty tissues in the immediate area are “burned up.” In other words, if you bend at the waist often enough, you’ll trim down your midsection.

Several years ago, however, a team of doctors studied a number of tennis players to see if the “spot” theory of fat reduction was fact. The subjects chosen for the study played tennis an average of six or more hours a week. The playing arm of each was subjected to more exercise than the other arm. The doctors expected to find the working limb larger because the muscles were more developed, and that is what they found. When the amount of fat was measured, however, it was the same on both arms for all the subjects. Compared with a group of similar nontennis playing individuals, however, the players had less fat in both arms than their more sedentary peers. The conclusion is that exercise causes fat to be used from all over the body and not from one specific area, regardless of the type of exercise.

So the statement is *false*. Despite claims to the contrary, **spot reducing** doesn’t work. It is impossible to reduce the amount of fat in a particular area without affecting the amount in other parts of the body.

2. To maintain an adequate level of physical fitness, one needs to exercise at least ____ days a week. (fill in the blank)

No one denies that a sedentary life leads to physical deterioration, but until recently scientists were unable to pinpoint specific bodily changes. The advent of space travel, however, has changed all that. Studies conducted by NASA scientists show that muscles that are not exercised regularly deteriorate at a phenomenal rate. For example, for every three days that a person is immobile, he or she loses one-fifth of maximal muscle strength. Other findings are equally disturbing. Immobility adversely affects the circulatory system, the respiratory system, the digestive system, and even the nervous system. While the changes brought about by sedentary living are not as dramatic as those demonstrated in the NASA laboratories, they are no less real. The difference is only in degree. Fortunately, exercising reverses the degenerative changes. Muscles quickly return to normal and metabolic systems respond positively.

What does this mean to you?

After extensive testing, NASA scientists concluded that, while daily exercise is desirable, three nonconsecutive days of programmed activity each week will maintain an adequate level of physical fitness. Just as the body cannot store certain vitamins but must have them regularly, it likewise cannot store certain conditioning effects of exercise. After 48 to 72 hours, one must use the muscles again to reestablish the desirable physical effects. You therefore should exercise at least *three days* a week. Of course, you can use a daily schedule.

3. The amount of perspiration indicates your level of fitness. (true or false)

Frequently people say they want to “work up a good sweat” when they exercise. In fact, some of them even don special rubber suits that make them perspire more profusely.

While exercising, we produce extra heat in proportion to the amount of muscle activity. The body’s temperature could easily rise as much as 10° F or more if this energy wasn’t dissipated. Fortunately, the body is designed to keep itself from overheating. Warm blood is brought to the skin where it loses heat to the surrounding air. The sweat glands begin to secrete water and the body is further cooled by evaporation of the perspiration. In cool weather, heat is given off easily, but when the environmental temperature rises, the body must work harder to cool itself, and sweating and evaporation become more profuse. Sweating and evaporation, however, only lower body temperature; they do not help you reduce body fat. You may weigh less immediately after a workout, but this is primarily a result of water loss. Replace the lost liquid and you’ll regain the weight. Sweating does not “clean the pores” either—there is no evidence that it is of any value in removing toxic materials from the body. Perspiration does not promote fitness. Fitness is developed by exercising the muscles of the body, not the sweat glands. The statement is *false*.

4. You burn more calories jogging one mile than walking the same distance. (true or false)

Work is defined as the energy required to move a given weight through a given distance. A 120-pound woman expends equal amounts of energy (i.e., does the same amount of work) traveling one mile, whether she walks or jogs.

So the statement is *false*.

Remember, of course, that you can jog a mile faster than you can walk it. If you jog rather than walk for 30 minutes you'll cover more distance and, consequently, burn more calories.

5. If your breathing doesn't return to normal within 10 minutes after you finish exercising, you've exerted yourself too much. (true or false)

Exercise does not have to be strenuous to be beneficial. In fact, exercise that is too difficult can prove harmful. A good rule of thumb is that your breathing should return to normal within 10 minutes after you've finished your routine. This statement is *true*.

Here are some other guidelines to help you determine if you are working too hard. Ten minutes after exercising you shouldn't feel your heart pounding in your chest nor should you be "all pooped out." In fact, you should begin to experience a "comeback" sensation. Too much exercise may make sleeping difficult and can produce fatigue into the next day. Exercise should not be strenuous, unpleasant, and exhausting; it should be moderate, enjoyable, and refreshing.

6. Walking is an excellent exercise. (true or false)

Physical anthropologists say human bone structure makes us the perfect walkers—ever notice how long your legs are in proportion to the rest of your body? But you don't see many people walking anymore. The "Don't Walk" light on busy street corners is not just a warning to pedestrians. It has become a sign of our times—that pedestrians are on the way out. That is too bad because walking is one of the best exercises known. It helps circulate blood throughout the body and thus has a direct effect on your overall feeling of well-being. This statement is *true*.

7. Vigorous stretching exercises keep muscles flexible. (true or false)

Flexibility comes from stretching the muscles and tendons that move the joints. This elasticity produces a smooth and graceful carriage—straight back, full gait, square shoulders. The look is easy to achieve if you do the proper exercises the correct way. Most people choose the right activities; the problem is that they don't practice them properly.

For example, to stretch your hamstrings—the muscles that run up the back of your thighs—you should sit on the floor, legs flat in front of you, and slowly bend forward. Most people, anxious to "get on with it," will start bouncing and bobbing in an attempt to stretch out those tight hamstrings. What they are actually doing, however, is defeating the purpose. The muscles will become tighter, not more flexible.

Stretching exercises should be done slowly, deliberately, and carefully, allowing the muscles to relax and let go. So the statement is *false*. Vigorous training encourages tightness. When doing stretching exercises, move slowly; when the first sign of pain occurs, hold that position for several seconds, then relax. Repeat the exercise several times.

8. It is possible to get enough exercise from one's ordinary daily activities. (true or false)

Exercise used to be commonplace. People didn't go around touching their toes or doing push-ups, but before the industrial revolution, most work was physical. It entailed movement and exercise. Today we use machines to do many tasks and to do all the "exercising" involved. You can mow your lawn while sitting down, and brush your teeth without moving your arm, and "let your fingers do the walking" in the telephone directory. Unless your job involves manual labor, it's almost impossible to find an opportunity to exercise in the course of an ordinary day. So although the question is debatable, usually the answer is *false*.

Granted there are still those who walk when they could ride, climb steps instead of taking the elevator, and hang clothes on the line instead of tossing them in the dryer, but do *you* know anyone who does? The conveniences are just too convenient for most of us to forgo.

Years ago people were trying to find ways to do less exercise. Now they are trying to find ways to do more. If you find it easy to program exercise into your daily routine, then, by all means, do so. If you're like most people, however, you are going to have to set aside some time for regular exercise.

9. The minimum amount of time you should spend exercising is 1 3 5 10 15 20 30 60 minutes. (circle your answer)

There are more than 400 skeletal muscles in the body. They are responsible for movement of the joints, maintenance of posture, support of body weight, circulation of blood, and for respiration and elimination. When muscles are used they stay firm, strong, supple, and shapely. When they are not used they become limp, weak, inflexible, and shapeless.

An exercise program should involve all the muscles. It should put the joints through their full range of motion. Some joints, such as the knee and elbow, are hinge joints; they move in only one plane—straightening and bending the limbs.

Other joints allow a wider range of motion. The hip joint, a ball-socket type, permits movement forward, backward, and to the sides, as well as in a rotating motion. The spine, which is really a series of joints, also facilitates movement in three planes. One can twist the trunk, and bend forward, backward, and to either side.

In addition, all skeletal muscles work in pairs—in opposition to one another. While one muscle moves a joint, another relaxes to permit the movement to take place. For example, when you bend your arm, the biceps contract while the triceps relax. When you straighten your arm, the reverse occurs.

A good exercise routine should contract and stretch all the major muscle groups, and this simply cannot be done with four or five exercises in five minutes. Research indicates about 20 minutes or more is the minimum amount of time needed for an adequate workout.

10. It takes 7 14 21 30 60 120 days to become physically fit. (circle your answer)

How long it takes you to become physically fit depends on how fit or unfit you are when you start. If you're out of condition, you certainly can't shape up in 21 days, as one book claims. You can, however, make significant progress in three weeks and be well on the way to becoming physically fit in time.

The question is really *moot*, because shaping up does not do any good unless you plan to stay in shape, and that means exercising—from now on. Don't think in terms of how long it will take you to get in shape, but rather in terms of a life plan to stay that way.

Effects of a Healthy Life-Style

The human body is a marvelous and intricate machine. From two cells, contributed by the mother and father, develop millions of cells that make up the blood, bone, muscle, nerves, skin, and other systems and organs.

We start to grow old at an early age. Physical vitality begins to decrease at about age 20, and then at a more rapid rate, depending on the changing habits of individuals as they grow older.

Humankind has always tried to find ways to increase the length of life. According to Dr. Walter Bortz of Stanford University, the human body may have the capacity to live 120 years. His contention is that by abusing this wonderful machine, we create conditions that bring about death around the age of 70.

The evidence is clear that we don't have to die at this age if we are willing to use preventive medicine as a means to bring about a longer, more productive, and healthier life. It may be that the time has come for humankind to shift from a curative to a preventive approach to medicine. This is not a new consideration. Thomas Jefferson, more than 200 years ago, stated: "The doctor of the future will give no medicine, but will interest his patients in the care of the human body in diet and in the causes and prevention of disease." No pill, vaccine, or injection can completely offset the diseases brought on by an unhealthy life-style. To bring about positive results, it is necessary to change our life-styles.

The question that arises is, What changes should I consider if I want to live longer and have a better quality of life? Some answers have been produced by a five-and-one-half-year study that was conducted by the UCLA School of Public Health in Alameda County in northern California. The study consisted of some 7,000 adults and was designed to determine what daily practices might result in an increase in life expectancy. As a result of this research, some basic health practices are found among people who live longer and healthier lives and are missing among people who suffer from degenerative diseases earlier in life.

Following are some basic health practices that were found to contribute to longevity.

1. Healthy people maintain a normal body weight. Dr. Jeremiah Stamler, who coauthored the book *Your Heart Has Nine Lives*, states, "The overweight man—depending on the amount of blubber—is two to three times more susceptible to heart disease than his neighbor of normal weight."

Compared with persons of proper weight, people with excess body fat have a higher risk of developing cancer, hypertension, diabetes, diseases of the heart and circulatory system, and many types of bone and joint diseases.

Some research indicates that a child who is obese when entering adolescence has only one chance in four of ever achieving normal weight and those who leave adolescence in an obese state have only one chance in 28 of ever achieving proper weight.

The late Dr. Paul Dudley White, a noted heart specialist, may have been right when he said, "Intemperance in food may be more dangerous than intemperance in alcohol or tobacco."

2. Another common practice among longer-living people was that they ate breakfast.

A survey has revealed that almost half the adults in the United States don't eat breakfast. A study conducted at the University of Iowa indicated that people who skip breakfast are less efficient, less attentive, and more clumsy when compared to those who eat breakfast. The approximate 12-hour time span since the last meal may deprive a person of essential nutrients needed for good performance.

Sometimes people who are trying to lose weight skip breakfast. A study at the University of Minnesota revealed that dieters placed on a diet of 2,000 calories per day and told to eat all 2,000 calories in only one meal lost significantly more weight when the calories were consumed during the breakfast meal.

This advice might be true: "Eat breakfast like a king, eat lunch like a prince, but eat dinner like a pauper."

3. Healthy people tend to sleep no more than seven to eight hours each night.

According to Dr. Ernest Hartmann of Boston State Hospital's Sleep Laboratory, people who regularly need more than nine hours of sleep are likely to be rebellious, opinionated, critical, chronic worriers, insecure, anxious, and indecisive.

Dr. Allen Rechtschaffen of the University of Chicago has stated that people who sleep nine or more hours a night are more prone to strokes and heart disease than short sleepers.

4. Another contributor to longevity was not smoking.

Smoking contributes to heart disease, cancer, emphysema, ulcers, and chronic bronchitis. Pregnant women who smoke increase the risk of miscarriage, birth defects that might be fatal, and complications during labor.

It has been estimated that on the average, cigarette smokers remove nearly eight and one-half years from their lives.

The sad fact is that not only smoking but also continual exposure to someone else's smoke can be hazardous to your health. Dr. Peter Fong of Emory University contends that nonsmokers who are in frequent contact with tobacco smoke run the risk of losing three years of their life. He stated, "The point is, nuclear energy accidents, or just radiation in general, account for a trivially small number of deaths compared to cigarette smoke, but everyone makes a tremendous fuss over that. No one pays much attention to whether cigarette smoke is present in the air."

5. People who live longer exercise regularly.

The human body was designed to be exercised. When we become inactive, the joints stiffen, the muscles weaken, the circulatory system is affected by increased fats, the heart loses strength, and thus, we become more prone to injury and disease.

It is possible to add years to your life, according to Dr. Ralph Paffenbarger Jr. of the Stanford University School of Medicine. A study conducted by Paffenbarger and other researchers of 16,936 Harvard alumni found that men who exercised regularly increased their life spans by one to more than two years when compared to their sedentary counterparts.

Moreover, it may be that a lifetime of engaging in exercise could reduce the negative health effects of cigarette smoking or high blood pressure. It may even partly offset an inherited tendency toward early death. Paffenbarger makes the point that the years of life gained through exercise are comparable to the amount gained if a cure for cancer could be found. A regular exercise program not only improves the quality of life, but also its length.

A study by Steven Blair and his associates at the Institute of Aerobic Research in Dallas, Texas, revealed that even modest amounts of exercise will reduce the risk of dying from heart disease, cancer, and other causes. In this study, the researchers determined the relationship of fitness to death rates. It was found that death rates of the least fit group were three times more than those of the most fit. These results were found for both men and women. One interesting aspect of the study was that the amount of exercise required to move from the lowest or sedentary category to the next fit category and thus obtain the greatest health benefits did not involve a great amount of exercise time. It was found that moderate-intensity activity, such as a brisk walk for 30 minutes several times a week, would bring about the physiological changes necessary to reduce the chance of death.

The late Dr. Paul Dudley White has called the span from age 20 to 40 the critical years in a person's life. During these years, we settle into a certain lifestyle that may very well determine our physical condition when we reach 50 and 60.

Thus, it is important that we look at the lifestyle we lead and, if necessary, make the changes needed to bring about a longer and happier life.

In 1995, leading scientists from 10 different countries and 4 continents met in Quebec City in Canada for a conference on "Physical Activity, Health, and Well-Being." The purpose of the conference was to discuss and summarize the current evidence that