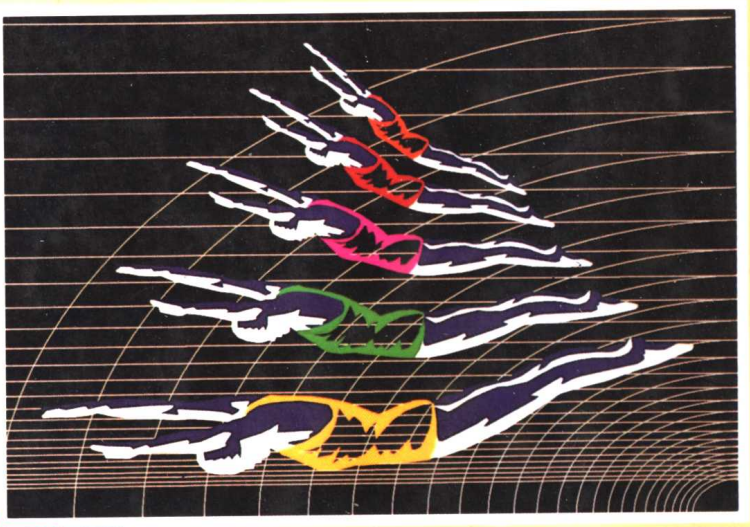
SECOND EDITION

Fitness and Wellness

The Physical Connection

Frank D. Rosato



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Preface

The aim of the second edition of this text is the same as the first—to establish through contemporary evidence the connection between physical fitness and wellness. The fact that this is a second edition attests to the interest in fitness and wellness by college and university instructors and their students.

There has been an explosion of new information since the first edition appeared in 1986. The massive research effort in this exciting field of study is manifestly evident as a host of researchers submit the results of their work to medical, exercise science, and nutritional science journals for publication. The stream of new information has been continuous and prolific. It clearly indicated that a revision was in order, and it presented several important challenges.

The first of these challenges involved filtering this new information and deciding what should be included in an introductory text of this type and what would have to be excluded. A second challenge was deciding what would be deleted from the first edition. These difficult decisions had to be made in order to keep the text within manageable proportions, yet expansive enough in scope and depth to convey the nature of the relationship between physical fitness and wellness as it is scientifically observed at this writing. Every chapter in this new edition has been significantly upgraded by the addition of new information and the deletion of outdated material. As a result, this edition is current, while approximately 30 percent larger than the first—a growth that reflects the research explosion in the field.

A third challenge to writing this edition involved the selection of specific references, and the decision upon the sheer number of references that would be used for documentation. Although the references that have been cited represent a fraction of those that were read in preparation for writing this manuscript, the number finally selected is greater than the number found in other introductory physical fitness texts. This is so for several reasons, but to fully comprehend the rationale for the need of a rich research emphasis, one must examine the major goals of the text. First, the primary objective is to inform and educate college-age students regarding physical fitness and wellness through strong documentation and the presentation of current and accurate information. Second, college and university instructors can also benefit from this text because it pulls together current research data from exercise science, medicine, and the allied health professions. This text is heavily referenced not only to validate the information it contains, but also to provide a convenient and handy source for those who are interested in gaining knowledge beyond its scope.

This edition, like its predecessor, does not utilize an exercise-by-the-numbers approach to physical fitness. Instead, through its content, it attempts to establish a sound base for lifetime participation in physical fitness activities and an active way of living. The "why" of exercise is emphasized, but the "how" is certainly not neglected.

Many changes have occurred in the second edition. The text has been expanded from eight to twelve chapters. There are more self-assessment tests, and these appear at the ends of chapters in which they belong as opposed to all appearing in an appendix. The adopters of this edition will receive an updated instructor's manual with a test bank and transparency masters. Also, a newsletter will be generated and periodically sent to adopters for the purpose of keeping them current. This newsletter will include new and interesting information, and adopters should feel free to make as many copies of the newsletter as they wish for class handouts or for other purposes.

Chapter 1 has been expanded, and a wellness self-inventory has been included. Chapter 2 from the first edition (The Fitness/Wellness Connection) has become Chapters 2, 3, and 4 in the current edition. This reorganization was necessary in order to accommodate the proliferation of new information intrinsic to these chapters, and secondly to partition the contents in such a way as to have homogeneous material in each chapter. Chapter 5, entitled "Motivation" is larger than its predecessor (Chapter 3), covering exercise adherence more fully, and adding more techniques for keeping people active. Chapters 6 and 7 in this edition have grown from the first edition Chapter 4 (Developing The Cardiorespiratory Component). Both Chapter 6 and Chapter 7 are concerned with cardiorespiratory fitness, but Chapter 6 presents the guidelines (or the "how") associated with the accomplishment of this goal, while Chapter 7 examines the various bodily adaptations that accrue from participation in activities of a cardiorespiratory nature. Chapter 8, Developing The Muscular Component, has been substantially updated. Chapter 9, Developing The Flexibility Component, was least affected by the revision, but some changes have occured. Chapters 10 and 11 in this edition grew from the first edition Chapter 7 (Developing The Body Composition Component). Significant additions and some deletions have occurred with this material. Chapter 10 presents the basics of nutrition, while Chapter 11 emphasizes the role of exercise and nutrition in weight management. Chapter 12 deals with lifetime fitness, and it too has been expanded and updated.

Chapter 12 is the only chapter which does not have a mini-glossary of important terms, but it, like all other chapters, features questions and statements that summarize major points (*Points to Ponder*), and margin notes that provide interesting tidbits of information on salient and timely topics. Self-assessment tests are included where appropriate at the ends of chapters. These can be administered and supervised by instructors, or students may take them as outside assignments by following the accompanying instructions. Norms or standards are presented as a frame of reference for interpretation of the results.

A textbook is usually not the work of one person, and this effort is no exception. The ideas of many people are represented here. The contributions begin with the data generated by all of the researchers whose works provide the cognitive base for this text, and extend from there to the reviewers whose ideas and suggestions helped to refine the finished product, to the young models who contributed to the aesthetics of the text, and to the professional staff of

West Publishing Company—Jerry Westby, Managing Editor, and Tom Hilt, Assistant Production Editor, who kept me on track in terms of direction and meeting deadlines.

Many thanks to my good friend Sheri Seiser who took the photographs that have substantially enhanced the written word. Thanks also to the attractive people who were willing to serve as models for this edition. Their names are: Angela Anton, P.J. Gardner, Raymond Hoffman Jr., Susan Hunter, Barbara McClanahan, Renee Melton, and Angela Rosato. Special thanks also go out to Tresa Holt and Brenda Johnson. Tresa spent several hours in various libraries digging out references, and Brenda typed and cut-and-pasted the entire manuscript.

As mentioned previously, the reviewers for this text were instrumental in refining the final product. Their strong contributions deserve both praise and appreciation. These individuals are:

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–Frank D. Rosato, Ed. D.

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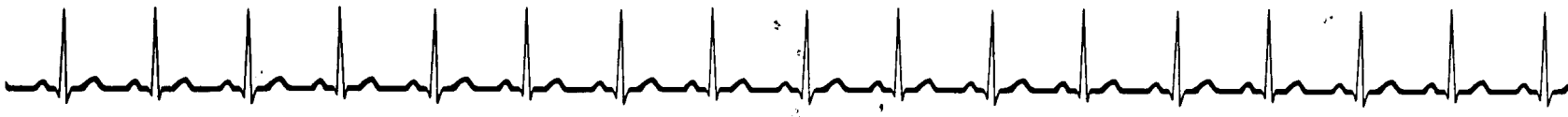


Introduction to Fitness and Wellness

Chapter Outline

Mini Glossary

Acute (or communicable) disease: a severe disease of short duration.
Agility: the ability to rapidly change direction while maintaining dynamic balance.
Balance: involves the maintenance of a desired body position either statically or dynamically. Also referred to as equilibrium.
Body composition: the amount of lean versus fat tissue.
Cardiovascular disease: a complex of diseases of the heart and circulatory system.
Cardiovascular endurance: the ability to take in, deliver, and extract oxygen for physical work.
Chronic disease: a long-lasting and/or frequently occurring disease.
Chronological age: an individual's calendar age.
Coordination: the integration of body parts resulting in smooth, fluid motion.
Flexibility: range of motion around a specific joint.
Health age: an individual's biological age.
Health-related fitness: a type of fitness that enhances one's health status by modifying many of the risks associated with lifestyle diseases.
Muscular endurance: the capacity to exert repetitive muscular force.
Muscular strength: the maximum amount of force that a muscle can exert in a single contraction.
Performance-related fitness: a type of fitness that allows one to perform physical skills with a high degree of proficiency.
Power: a function of work divided by the time that it takes to perform the work.
Reaction time: the elapsed time between the presentation of a stimulus and its response. Also called response latency.
Risk-factor profile: an objective representation of risk factors for a selected disease, with a probability statement regarding how and when death may occur based upon lifestyle habits.
Speed: performance of a movement in the shortest amount of time. Also known as velocity.
Wellness: a dynamic and multifaceted approach to optimal health that centers upon individuals taking responsibility for their health status.

Introduction

Wellness involves optimal development of the physical self, the constructive use and management of stress energy, effectiveness in communicating and dealing with emotions, positive use of the mind, environmental sensitivity, and the development of productive relations with other people. Wellness is a perpetual quest. It is characterized by individuals who take the responsibility for striving for optimal functioning by mitigating the negatives and building on the positives in their lives. The choices that we make influence our state of health and well-being.

We must stop trying to buy health with our dollars and start earning it with our behaviors.
—Don Ardell
Planning for Wellness

Disease care is very expensive in our country. Most of the dollars spent for health care are really spent for disease care with few resources devoted to preventing disease.

Physical fitness, one of the supporting structures of wellness, is comprised of health- and performance-related components. An overview of the relationship between physical fitness and wellness is presented. Data from surveys that indicate the approximate number of Americans who exercise as well as the types of activities in which they participate are examined. A short chronology delineating the events having an impact on physical fitness during this century with particular reference to the development and continuance of the present movement is presented.

Wellness Defined

Wellness embodies a characteristic lifestyle—a mind-set that personifies a positive approach to health. It is the antithesis of our present health care system which many have more accurately labeled a "disease care" system.

Health Care or Disease Care?

Wellness goes beyond prevention in that it initiates a whole new way to conceive of health: not simply as the absence of disease, as most of us have been led to believe, but as a continual process of attaining greater and greater personal well-being. Wellness does not describe dos and don'ts; it's much more than that.

Health promotion is the fiber of wellness. These two words may have a familiar ring to them, since they have indeed been part of our vocabulary for years. In fact, they have long been drowned out by organized medicine's traditional orientation not toward health, but toward illness.

To understand this orientation, it may help to call to mind a legendary Cornish test of sanity. Imagine a running faucet, beneath which sits a bucket rapidly filling with water. Handed a ladle, you are instructed to empty the bucket. As Cornish legend has it, if you fail to shut off the water before you start ladling, you may find yourself declared insane.

So it goes, say many critics, with our current health-care system, a system that ladles frantically—removing cancerous lungs, bypassing blocked coronary arteries, prescribing all manner of pills—with hardly a glance at the still-running faucet. In name, we speak of our health-care system. In truth, we have built a multi-billion-dollar disease care system, which according to many estimates, allocates up to 96 percent of these dollars for treatment and only 4 percent or less for prevention and education. Ergo, we ladle with 96 percent of our resources and expend only 4 percent of our efforts trying to slow the flow from the faucet. The wellness movement seeks to bring these numbers considerably closer together.

It does so in the belief that significant society-wide gains in health can no longer be expected from fancier hospitals, more sophisticated surgical procedures and more potent drugs.

Grossman, John, "Inside the Wellness Movement," *Health*, Family Media, Inc., Nov./Dec. 1981. Reprinted by permission.

The World Health Organization has defined health as "a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity." The generic correctness of this definition is irrefutable, but its lack of specificity renders it meaningless in the practical sense.

High-level wellness is a process of growth, evolving, and changing which includes:

1. being free from symptoms of disease and pain as much as possible
2. being able to be active—able to do what you want and what you must at the appropriate time
3. being in good spirits most of the time.

These characteristics indicate that good health is not something that is suddenly achieved at a specific time, such as getting a college degree. Rather, health is an ongoing process—indeed, a way of life—through which you develop and encourage every aspect of your body, mind, and feelings to interrelate har-

moniously as much of the time as possible.[1] It involves optimal development of the physical self, the constructive use and management of stress energy, effectiveness in communicating and dealing with emotions, positive use of the mind, environmental sensitivity, and the development of productive relations with other people.[2] From this description, it is quite clear that the quality of one's health and the quest for total well-being is primarily the responsibility of each individual—it is not the responsibility of physicians nor the conventional medical care and delivery system, it is not the responsibility of government, and it is not the responsibility of society. It is not our intention to denigrate this country's medical care system; it is currently the best in the world. Medical training focuses upon treating diseases rather than preventing them, and there will always be a critical need for these skills. Even if medicine shifted its priorities toward prevention (and this entails considerable resources), the fact remains that we are to a large extent the masters of our own destinies. We ultimately make the choices that influence our health.

You the individual can do more for your own health and well-being than any doctor, any hospital, any drug, any exotic medical device.
—Joseph Califano

Health: A Matter of Choice

We make choices, both positive and negative, about smoking cigarettes, wearing seat belts, exercise, weight control, nutrition, alcohol intake, frequency of medical examinations, and so on. These choices and the ensuing behavior patterns profoundly affect the state of our health.

Some people make seemingly inappropriate choices and live to a ripe old age, but these are the exceptions rather than the rule. They have beaten the odds and make headlines as a result. Winston Churchill was an example of one who defied the principles of good health and lived more than eighty years. But one must wonder how much longer he might have lived if he were less indulgent when it came to the harmful excesses in his life. Genetically, he was probably well-endowed for longevity, but his lifestyle practices seemed to detract from his biological potential. The majority of those who follow similar lifestyles die early and become mere statistics in some esoteric piece of research. These people do not make headlines because their fate is the norm: it is expected and it is not newsworthy. By featuring these exceptions, the media inadvertently promotes a cavalier attitude toward good health practices.

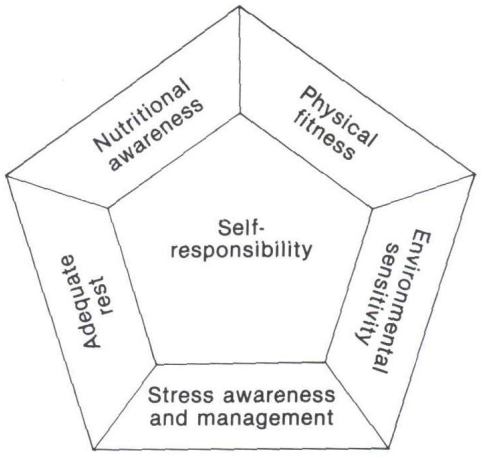
Figure 1.1 graphically emphasizes the importance of self-responsibility in a wellness lifestyle by ascribing to it the predominant position among all factors.

Living in accordance with this model fosters an attitude of responsibility for our actions and removes the compulsion to blame others or to make excuses for our predicament. During the last 20 years, many Americans have positively altered their daily habits and accepted responsibility for their own health. Unfortunately, this group still represents a minority of the population. The notion that good health is represented by the absence of disease and the avoidance of disability has outlived its usefulness, but it continues to persist. Consequently, high-level wellness escapes most Americans, since many will continue to rely upon the annual or biannual medical exam in the hope that they will receive a "clean bill of health." If they do, the old lifestyle is reinforced, regardless of the healthy or unhealthy practices that characterize it. If the old lifestyle includes cigarette smoking, a diet high in fat and cholesterol, sedentary habits, and an inability to effectively cope with stress, then it is virtually certain to lead to premature disease. In fact, the **chronic diseases** (cardiovascular diseases, cancer,

To a greater extent than most of us are willing to accept, today's disorders of overweight, heart disease, cancer, blood pressure, and diabetes are by-and-large preventable. In this light, true health insurance is not what one carries on a plastic card, but what one does for oneself.
—Lawrence Power, M.D.

FIGURE 1.1

A Constellation of Selected Wellness Factors.



Adapted from D. Ardell, *Planning for Wellness*, Dubuque, Iowa: Kendall/Hunt Publishing Co., 1982.

diabetes, etc.) that have replaced the **acute or communicable diseases** as the leading causes of death in the past four to five decades, are the result of such a lifestyle. The chronic diseases are not transmitted from person to person through contact; rather, they are voluntary or self-inflicted. The tendency for developing a few of the chronic diseases appears to run in some families. Whether or when these diseases manifest themselves is influenced substantially by the living habits of those who are involved. The chronic diseases are not prevented by innoculation nor can they be cured with antibiotics; instead, they are the calamitous results of the choices we have made. Consider the following:

1. Seven of the ten leading causes of death can be substantially reduced by controlling blood pressure, quitting the cigarette habit, eating more wisely, getting regular exercise, and reducing alcohol consumption.
2. The heart attack risk is doubled in men who are cigarette smokers.
3. Ten percent of all deaths in the United States are alcohol-related.
4. Occupational hazards are responsible for approximately 20 percent of cancer mortality.
5. Highway accidents are responsible for nearly 50,000 deaths annually. A significant number of these can be prevented with seat belts, shoulder harnesses, and sobriety.
6. High-blood pressure, a precursor of 500,000 strokes and 1,500,000 heart attacks per year, afflicts approximately 17 percent of Americans.
7. Suicide is steadily rising as a leading cause of death among teenagers and young adults.[3]
8. Eighty million Americans are overweight; 70 million have arthritis.
9. Premature employee deaths account for the loss of $20 billion per year.[4]

"Americans annually lose 15 million years of living from preventable causes."
—Surgeon General's Report[5]

The difference in the health status of any two Americans is primarily determined by factors beyond a physician's control.[4] By following reasonable rules for healthy living, we can reduce the rate of premature morbidity and mortality. This has become imperative as the cost of disease care rises to a staggering and disproportionate amount of the gross national product. In 1979, the nation's total health care bill was $212.2 billion;[6] by 1984, it had risen to $400 billion,[7] and in 1986,

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