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LIFETIME PHYSICAL FITNESS & WELLNESS

A PERSONALIZED PROGRAM



SIXTEENTH EDITION

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***Lifetime Physical Fitness and Wellness:
A Personalized Program, 16e***

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Preface

The American lifestyle does not provide the human body with sufficient physical activity to enhance or maintain adequate health. In reality, our way of life is a serious threat to our health that increases the deterioration rate of the human body and leads to premature illness and mortality.

People in the U.S. say they believe that physical activity and positive lifestyle habits promote better health, but most do not reap these benefits because they simply do not know how to implement and maintain a sound physical fitness and wellness program that will yield the desired results. About 45 percent of the adults in the U.S. do not meet the recommended guidelines for aerobic and muscular fitness activities, thereby placing themselves at risk for premature morbidity, injury, and early death.

Furthermore, the energy (caloric) expenditure that used to result from activities other than planned daily exercise and basic bodily functions (known as nonexercise activity thermogenesis or NEAT) has also substantially decreased during the last century. Examples of these activities include standing and walking while performing tasks, yard work, housecleaning, gardening, taking stairs, walking to and from stores or offices, using a bicycle as the primary mode of transportation, and so on. NEAT used to represent a major portion of daily energy expenditure.

Currently, people spend about eight hours per day or more of their waking time sitting. Excessive sitting is unnatural to the body and is detrimental to human health. This overall decline in physical activity accelerates aging, obesity, and loss of physical function and further contributes to the development of chronic disease and premature mortality.

A regular exercise program is as close as we get to the miracle pill that people look for in order to enjoy good health and quality of life over a now longer lifespan. The myriad benefits of exercise include enhanced functional capacity; increased energy; weight loss; improved mood, self-esteem, and physical appearance; and decreased risk for many chronic ailments, including obesity, cardiovascular disease, cancer, and diabetes. As stated as far back as 1982 in the prestigious *Journal of the American Medical Association*, “There is no drug in current or prospective use that holds as much promise for sustained health as a lifetime program of physical exercise.”

The benefits of exercise, along with healthy lifestyle habits, are reaped only through action. Along with the most up-to-date health, fitness, and nutrition guidelines, the information in this book provides extensive behavior modification strategies to help you abandon negative habits and adopt and maintain healthy behaviors.

Many of the behaviors we adopt are a product of our environment and value system. Unfortunately, we live in a “toxic” health/fitness environment. Becoming aware of how the environment affects our health is vital if we wish to achieve and maintain wellness. Yet we are so habituated to this modern-day environment that we miss the subtle ways it influences our behaviors, personal lifestyle, and health every day. As you study and assess physical fitness and wellness parameters, you will need to take a critical look at your behaviors and lifestyle—and most likely make selected lifetime changes to promote overall health and wellness. As you understand and live the concepts presented in this book, your value system will change, and you’ll be prepared to embark on a lifetime physical fitness and wellness journey.

The book is organized in the most efficient manner possible for students to derive the greatest benefit from its contents. Each chapter starts with the chapter objectives, followed by *Frequently Asked Questions (FAQ)*, a *Real Life Story*, and a *Personal Profile* based on the chapter contents to pique the reader’s interest in the chapter’s topic. The chapter contents are presented next, with extensive use of graphs, charts, tables, activities, critical thinking questions, keys to wellness, informational boxes, behavior modification boxes, definitions of key terms, and photographs to maximize student learning, content retention, and motivation for healthy lifetime behavioral change. Like no other textbook, the Hoegers’ *Fitness & Wellness* series makes exceptional use of these special pedagogical aids and high-interest features.

A unique feature of *Lifetime Physical Fitness & Wellness* is the activity experiences provided as key information is addressed in each chapter. These activities allow each student to develop *A Personalized Program* according to individual needs. All chapters highlight key wellness concepts throughout the text and conclude with *Assess Your Behavior* and *Assess Your Knowledge* sections so that students may evaluate the impact of the subject matter on their personal lifestyles and their understanding of the chapter contents through ten multiple-choice questions.

Scientific evidence has clearly shown that improving the quality—and most likely the longevity—of our lives is a matter of personal choice. The biggest challenge we face in this century is to learn how to take control of our personal health habits to ensure a better, healthier, happier, and more productive life. The information presented in this book has been written with this goal in mind and provides students with the necessary tools and guidelines to implement and adhere to a *Lifetime Physical Fitness*

and Wellness Program. The emphasis throughout the book is on teaching students how to take control of their personal lifestyle habits so that they can do what is necessary to stay healthy and realize their highest potential for well-being.

New in the 16th Edition

All chapters in the 16th edition have been revised and updated according to recent advances and recommendations in the field, including information reported in the literature and at professional health, fitness, sports medicine conferences, and the reviewers of the 15th edition. In addition to selected new photographs, figures, and insert boxes, the following are the most significant changes to this edition.

Chapter Updates

Chapter 1: Physical Fitness and Wellness

- Updating of all facts and statistics according to the latest research
- Several redesigned figures to enhance content retention
- Updated *Guidelines for Physical Activity* based on its 2nd edition released by the federal government in late 2018
- Modified health history questionnaire to include key questions related to virus infections
- Conformity of the blood pressure assessment with the 2019 American Heart Association guidelines for the proper measurement of blood pressure

Chapter 2: Behavior Modification

- Editing of the *Living in a Toxic Health and Fitness Environment* and *Planning and Willpower* sections and their reduction in size
- An updated introduction and information focusing on personalized values
- A new figure illustrating readiness to change that is based on the student's own confidence and motivation
- With the current trend toward learning outcomes in higher education, a SMART Goals section that teaches students to write goals with a wellness outcome in mind

Chapter 3: Nutrition for Wellness

- Editorial changes throughout the chapter update nutrition concepts based on current research and reports in the field
- Updated key nutrient concerns
- Inclusion of the new *Nutrition Facts Label* with U.S. recommended Daily Values

- New information on milk: whole dairy versus reduced fat dairy; omega fatty acids; unprocessed, processed, and ultra-processed foods; super foods; phytonutrients; soy products; nuts; and probiotics
- Updates to the *Vegetarianism, Nutrient Supplementation, Antioxidants, Vitamin D, Organic Foods, Bone Health and Osteoporosis*, and *Genetically Modified Crops* sections

Chapter 4: Body Composition

- New information is provided in the assessment of body composition through bioelectrical impedance, body mass index, waist circumference, and current obesity trends

Chapter 5: Weight Management

- The most recent data tables on the incidence of overweight and obesity in the U.S., published by the Centers for Disease Control and Prevention (CDC)
- Updates to all of the following sections: *The Diet Craze*, *Mindful Eating Versus Distracted Eating*, *Metabolism and Lean Body Mass*, *Adjusting Your Fat Intake*, *Sleep and Weight Management*, and *Weight Loss Strategies*
- New content on the *Flexitarian Diet* and *Intermittent Fasting Diet*
- Inclusion of *Foods That Boost Satiety*

Chapter 6: Cardiorespiratory Endurance

- Expanded discussion on the *Responders Versus Nonresponders* section to include information on the importance of intensity and frequency of exercise to experience physiological benefits
- Enhanced content on the *Guidelines for Developing Cardiorespiratory Endurance* and the variables that govern exercise prescription
- New physical activity pyramid figure
- Enhanced discussion on *Physical Stillness: A Deadly Proposition*

Chapter 7: Muscular Fitness

- An update on the mounting evidence of strength training on decreasing all-cause and cancer-related deaths
- Up-to-date dietary guidelines for strength and muscular development
- Expanded information on *Core Strength-Training*, including antiextensors, antilateral flexors, and antirotators principles.
- New strength-training exercises

Chapter 8: Muscular Flexibility

- Revised *Benefits of Good Flexibility* section
- Replacement of the Shoulder Rotation Test with the Finger Touch Test for ease of administration

- An update to the sections on *Preventing and Rehabilitating Low Back Pain*, *Causes of Low Back Pain*, *When to Call a Physician*, and *Surgery*
- New flexibility exercises

Chapter 9: Personal Fitness Programming

- Simplified chapter contents to enhance readability
- Enhanced section on *Exercise in Cold Water*
- Updated guidelines for exercise during pregnancy and contraindications to exercise during pregnancy

Chapter 10: Preventing Cardiovascular Disease

- Up-to-date data on the prevalence of cardiovascular disease
- Updates to the self-assessment coronary heart disease risk factor analysis
- Condensed versions of several coronary heart disease risk factors
- Addition of information on the role of metabolic equivalents (MET level) on cardiovascular health and longevity and on the importance of physical activity throughout the day to the *Physical Inactivity* risk factor for coronary heart disease
- Enhanced, updated, and simplified explanation for the *Abnormal Cholesterol Profile* risk factor for cardiovascular disease
- An updated section on *Metabolic Syndrome*
- Several updates in the *Hypertension* section, including new guidelines from the American Heart Association and the American College of Cardiology for the prevention, detection, evaluation, and management of blood pressure, as well as the role of aerobic and strengthening exercises on blood pressure
- Additional information in the section on other, lesser known potential risk factors for coronary heart disease, including resting heart rate, sleep, and emotional distress

Chapter 11: Cancer Prevention

- Inclusion of the latest figures on the U.S. incidence and death rates for major cancer sites
- Updated figures on the estimates of the relative role of the major cancer-causing factors
- Enhanced discussion on current guidelines for cancer prevention
- New information on the effects of exercise on cancer risk, aspirin and cancer risk, sugar and cancer, alcohol and cancer, and body weight and cancer
- Updates to the *Cancer Questionnaire: Assessing Your Risks*

- Updated data on the incidence and mortality rates of cancer, along with the most common site-specific cancer risk factors

Chapter 12: Stress Assessment and Management Techniques

- New insert box on *The Power of Positivity*
- Expanded information on the *Sleep Management* section, including stages of sleep, health effects of sleep deprivation, tips for better sleep, and sleeping drugs
- Enhanced information on *Characteristics of Good Stress Managers*

Chapter 13: Addictive Behavior

- New figures reflecting data specific to addictive behaviors most prevalent in college students, including marijuana, heroin, and alcohol abuse
- Updated data on recent trends in substance abuse reported in the *National Survey on Drug Use and Health* by the U.S. Department of Health and Human Services
- Enhanced information on the addictive, physiological effects, and trends of caffeine intake
- Expanded contents on *Nonmedical Use of Prescription Drugs*
- Expanded information on *Marijuana* use and new information on the *Legalization of Marijuana*, its use and trends
- Additional information on the use of electronic cigarettes

Chapter 14: Preventing Sexually Transmitted Infections

- New data on the unprecedented rise of new cases of chlamydia, gonorrhea, and syphilis—now reaching an all-time high in the U.S.
- Updated STI screening recommendations for sexually active adults according to CDC guidelines
- New and updated data and graphs on the prevalence of STIs according to the latest data from the CDC
- Updated HPV vaccination schedule recommendations for adolescents according to recently published CDC guidelines

Chapter 15: Lifetime Fitness and Wellness

- Updates to the *Life Expectancy and Physiological Age Prediction Questionnaire* and to the *Complementary and Alternative Medicine* and *Personal Trainers* sections

Additional Course Resources

- **Health MindTap™ for Lifetime Physical Fitness & Wellness.** MindTap is well beyond an e-book, a homework solution or digital supplement, a resource center website, a course delivery platform, or a learning management system. More than 70 percent of students surveyed said it was unlike anything they have seen before. MindTap is a personal learning experience that combines all your digital assets—readings, multimedia, activities, and assessments—into a singular learning path to improve student outcomes.
- **Diet & Wellness Plus.** The Diet & Wellness Plus app in MindTap helps you gain a better understanding of how nutrition relates to your personal health goals. It enables you to track your diet and activity, generate reports, and analyze the nutritional value of the food you eat! It includes more than 55,000 foods in the database, custom food and recipe features, and the latest dietary references, as well as your goal and actual percentages of essential nutrients, vitamins, and minerals. It also helps you to identify a problem behavior and make a positive change. After completing a wellness profile questionnaire, Diet & Wellness Plus will rate the level of concern for different areas of wellness, helping you determine the areas where you are most at risk. It then helps you put together a plan for positive change by helping you select a goal to work toward—complete with a reward for all your hard work.
- **Instructor Companion Site.** Additional instructor resources for this product are available online. Instructor assets include an Instructor's Manual, Educator's Guide, PowerPoint® slides, and a test bank powered by Cognero®. Sign up or sign in at www.cengage.com to search for and access this product and its online resources.
- **Cengage Learning Testing Powered by Cognero.** Cengage Teaming Testing Powered by Cognero is a flexible, online system that allows you to:
 - author, edit, and manage test bank content from multiple Cengage Teaming solutions.
 - create multiple test versions in an instant.
 - deliver tests from your TMS, your classroom, or wherever you want.

Brief Author Biographies

Werner W. K. Hoeger is a professor emeritus of the Department of Kinesiology at Boise State University, where he taught between 1986 and 2009. He had previously taught at the University of the Andes in Venezuela (1978–1982); served as Technical Director of the Fitness Monitoring Preventive Medicine Clinic in Rolling Meadows, Illinois (1982–1983); taught at The University of Texas of the Permian

Basin in Odessa, Texas (1983–1986); and briefly taught for one semester in 2012, 2013, and 2016 as an adjunct faculty at Brigham Young University Hawaii in Laie, Hawaii. He remains active in research and continues to lecture in the areas of exercise physiology, physical fitness, health, and wellness.

Dr. Hoeger completed his undergraduate and master's degrees in physical education at the age of 20 and received his doctorate degree with an emphasis in exercise physiology at the age of 24. He is a *Fellow* of the *American College of Sports Medicine* and also of the *Research Consortium of SHAPE America (Society of Health and Physical Educators)*. In 2002, he was recognized as the *Outstanding Alumnus* from the *College of Health and Human Performance* at *Brigham Young University*. He is the recipient of the first *Presidential Award for Research and Scholarship* in the *College of Education* at *Boise State University* in 2004.

In 2008, he was asked to be the *keynote speaker* at the *VII Iberoamerican Congress of Sports Medicine and Applied Sciences* in Mérida, Venezuela, and was presented with the *Distinguished Guest of the City* recognition. In 2010, he was also honored as the *keynote speaker* at the *Western Society for Kinesiology and Wellness* in Reno, Nevada.

Using his knowledge and personal experiences, Dr. Hoeger writes engaging, informative books that thoroughly address today's fitness and wellness issues in a format accessible to students. Since 1990, he has been the most widely read fitness and wellness college textbook author in the U.S. He has published a total of 66 editions of his nine fitness- and wellness-related titles. Among the textbooks written for Wadsworth/Cengage Learning are *Principles and Labs for Fitness and Wellness: A Personalized Program*, 15th edition; *Fitness & Wellness*, 14th edition; *Principles and Labs for Physical Fitness*, 10th edition; *Wellness: Guidelines for a Healthy Lifestyle*, 4th edition; and *Water Aerobics for Fitness & Wellness*, 4th edition (with Terry-Ann Spitzer Gibson).

Dr. Hoeger was the first author to write a college fitness textbook that incorporated the wellness concept. In 1986, with the release of the first edition of *Lifetime Physical Fitness & Wellness*, he introduced the principle that, to truly improve fitness, health, and quality of life and to achieve wellness, a person needed to go beyond the basic health-related components of physical fitness. His work was so well received that every fitness author in the field immediately followed his lead.

As an innovator in the field, Dr. Hoeger has developed many fitness and wellness assessment tools, including fitness tests such as the Modified Sit-and-Reach, Total Body Rotation, Shoulder Rotation, Muscular Endurance, and Muscular Strength and Endurance, and Soda Pop Coordination Tests.

Proving that he “practices what he preaches,” he was the oldest male competitor in the 2002 Winter Olympics in Salt Lake City, Utah, at the age of 48. He raced in the sport of luge along with his then 17-year-old son Christopher. It was the first—and so far only—time in Winter Olympics history that father and son competed in



Monique Saenz, BYUH



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she now participates in a variety of fitness activities to enjoy good health and maintain a high quality of life.

Husband and wife have been jogging and strength-training together for more than 44 years. They are the proud parents of five children, all of whom are involved in sports and lifetime fitness activities. Their motto: “Families that exercise together, stay together.”

Cherie I. Hoeger received her degree in English with an emphasis in editing for publication. She has been working for 16 years as a freelance writer and editor; writing research and marketing copy for client magazines, newsletters, and websites; and contracting as a textbook copy editor for Cengage Learning (previously under Thomson Learning

and the Brooks/Cole brand). She joined Fitness & Wellness, Inc. in 2014 as a writer and scientific literature reviewer. She took on a more significant role as a coauthor in 2016. Her work has greatly enhanced the excellent quality of the *Fitness & Wellness* textbooks. She is a firm believer in living a healthy and wellness lifestyle, regularly attends professional meetings in the field, and is an active member of the American College of Sports Medicine.

Andrew D. Meteer received a degree in exercise science and has worked for several years as a personal trainer at Equinox Sports Club in New York City. An active member of the American College of Sports Medicine, Andrew brings vast experience in exercise programming for a diverse

the same event. In 2006, at the age of 52, he was the oldest competitor at the Winter Olympics in Turin, Italy. At different times and in different distances (800 m, 1,500 m, and the mile) in 2012, 2014, 2015, 2016, 2017, 2018, 2019, and 2020, Dr. Hoeger reached All-American standards for his age group by USA Track and Field (USATF). In 2015, he finished third in the one-mile run at the USATF Masters Indoor Track and Field National Championships, and third and fourth, respectively, in the 800- and 1,500-meter events at the Outdoor National Senior Games. In 2016, he advanced to the finals in both the 800 m and the 1,500 m at the World Masters Track and Field Championships held in Perth, Australia. He finished seventh (out of 12 finalists) in the 800 m and eighth (out of 16 finalists) in the 1,500 m. Most recently, in 2019, he finished second in the 800 m at the USATF Masters Outdoor Track and Field Championships and won the gold medal in the 800 m and 5K, and the silver medal in the 1,500 m and 3,000 m at the Hunstman World Senior Games in St. George, Utah.

Sharon A. Hoeger is vice president of Fitness & Wellness, Inc., of Boise, Idaho. Sharon received her degree in computer science from Brigham Young University. In the 1980s, she served as a computer science instructor at The University of Texas of the Permian Basin. She is extensively involved in the research process used in retrieving the most current scientific information that goes into the revision of each textbook. She is also the author of the software that was written specifically for the fitness and wellness textbooks. Her innovations in this area since the publication of the first edition of *Lifetime Physical Fitness & Wellness* in 1986 set the standard for fitness and wellness computer software used in this market today.

Sharon is a coauthor of five of the seven fitness and wellness titles. She also served as *chef de mission* (chief of delegation) for the Venezuelan Olympic Team at the 2006 Winter Olympics in Turin, Italy. A former gymnast,



Courtesy of Ricardo Raschini

population and expertise with fitness trends in business and community settings. His excellent writing skills and up-to-date research-based knowledge in the field further strengthen market-leading fitness and wellness concepts presented in this book.

Acknowledgments

This edition is dedicated to Blake Hansen. His kindness, unconditional support, and exceptional skills will be forever appreciated. We would like to thank Christine Kuzma and Mackenzie Malach for their kind assistance with additional photography for this 16th edition. Also, the completion of the 16th edition of *Lifetime Physical Fitness & Wellness: A Personalized Program* was made possible through the contributions of many individuals. In particular, we would like to express our gratitude to the reviewers of the 15th edition; their valuable comments and suggestions are most sincerely appreciated.

Reviewers for the 16th edition:

Dr. Vicki Boye, Concordia University

Carl Bryan, Central Carolina Community College

Jessica Buel, Clackamas Community College



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Lisa Chaisson, Houston Community College

Dr. Karen Dennis, Illinois State University

Amy Howton, Kennesaw State University

Cynthia Karlsson, Virginia Polytechnic Institute and State University

Dr. Jerome Kotecki, Ball State University

Dr. Justin Kraft, Missouri Western State University

Linda J. Romaine, Raritan Valley Community College



1

The human body is extremely resilient during youth—not so during middle and older age. The power of prevention, nonetheless, is yours: It enables you to make healthy lifestyle choices today that will prevent disease in the future and increase the quality and length of your life.

Image Source/Getty Images

Physical Fitness and Wellness

OBJECTIVES

- 1.1** Describe the health and fitness consequences of physical inactivity.
- 1.2** Identify the major health problems in the United States.
- 1.3** Monitor your daily physical activity.
- 1.4** Describe the federal Physical Activity Guidelines for Americans.
- 1.5** Define wellness and list its dimensions.
- 1.6** Compare between health fitness standards and physical fitness standards.
- 1.7** Define physical fitness and list health-related and performance-related components.
- 1.8** Describe the benefits and significance of participating in a comprehensive wellness program.
- 1.9** Determine whether you can safely initiate an exercise program.
- 1.10** Assess resting heart rate and blood pressure.

FAQ

Why should I take a fitness and wellness course?

Most people go to college to learn how to make a living, but a fitness and wellness course will teach you how to live—how to truly live life to its fullest potential. Some people seem to think that success is measured by how much money they make. Making a good living will not help you unless you live a wellness lifestyle that will allow you to enjoy what you earn. You may want to ask yourself: Of what value are a nice income, a beautiful home, and a solid retirement portfolio if, at age 45, I suffer a massive heart attack that will seriously limit my physical capacity or end life itself?

Is the attainment of good physical fitness sufficient to ensure good health?

Regular participation in a sound physical fitness program will provide substantial health benefits and significantly decrease the risk of many chronic diseases. And although good fitness often motivates people to adopt additional positive lifestyle behaviors, to maximize the benefits for a healthier, more productive, happier, and longer life we have to pay attention to all seven dimensions of wellness: physical, social, mental, emotional, occupational, environmental, and spiritual. These dimensions are interrelated, and one frequently affects the other. A wellness way of life requires a constant and deliberate effort to stay healthy and to achieve the highest potential

for well-being within all dimensions of wellness.

If a person is going to do only one thing to improve health, what would it be?

This is a common question. It is a mistake to think, though, that you can modify just one factor and enjoy wellness. Wellness requires a constant and deliberate effort to change unhealthy behaviors and reinforce healthy behaviors. Although it is difficult to work on many lifestyle changes all at once, being involved in a regular physical activity program, avoiding excessive sitting, observing proper nutrition, and avoiding addictive behavior are lifestyle factors to work on first. Others should follow, depending on your current lifestyle behaviors.



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Modern-day conveniences lull people into a sedentary lifestyle.

Do you ever stop to think about factors that influence your actions on a typical day? As you consider typical moments from this past week, which actions were positive and healthy and which may have been negative or harmful? Did you go for a walk or have a conversation with a friend? Did you buy

and eat food that you felt good about? Did you pursue a task that held purpose and meaning for you? Conversely, did you battle on-going stress and anxiety or allow yourself irregular sleep? Did you settle for highly processed food? Did you struggle with relationship problems? Did you regress to previous, unhealthy behaviors?

2 Lifetime Physical Fitness and Wellness: A Personalized Program

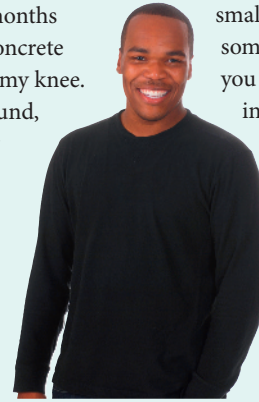


Real Life Story

Jim's Experience

I am pretty athletic and played baseball and basketball in high school. I also grew up eating well, since my dad is a chef who specializes in healthy cuisine. So when I got to college, I was sure that I was already doing everything necessary to be healthy. However, at the same time that I was congratulating myself for my healthy lifestyle, I was practicing some very unhealthy habits without even thinking about it. My sleep schedule was horrible. I would sometimes get only three to four hours of sleep a night. At times I would pull an “all-nighter,” and at other times I would crash and sleep for 12 hours. I drank huge amounts of black coffee, diet soda, or energy drinks to stay alert. I was under a lot of stress—I was pre-med, and I was struggling in some of my classes. My two roommates and I did not get along, so there were constant fighting and tension between us. I felt isolated and unhappy, and I questioned whether I had made a mistake choosing the college I did. In order to blow off steam, I started going to frat parties and drinking too much. I would often get sick and then suffer a hangover the next morning. I didn't see this as a problem because it seemed to be something a lot of students were doing.

And to add to all that, after months of high-impact running on concrete surfaces, I ended up injuring my knee. I was barely able to move around, let alone work out. I was only in my second year of college when I took a fitness and wellness class. It was then that I really thought about how my lifestyle was affecting my health and wellness. During the course of the class, I made several changes. I tried to even out my sleep schedule and get seven to eight hours a night. To make that happen, I had to work on my procrastination. I could no longer wait to write a paper until the night before it was due and still expect to get eight hours of sleep. This change actually helped me do better in my classes, which relieved some of my stress. The times when I still felt stressed out, I started meditating or listening to relaxing music instead of going out and drinking. I also learned about how to exercise safely and prevent injuries. I took up swimming, since it is a good, low-impact workout. I feel that, just as how sometimes problems can snowball and lead to more problems,



Karin Hildebrand Lau/Shutterstock.com

small changes for the better can sometimes snowball too, and once you improve one habit, other things in your life become easier to fix. Because of the changes I have made, the rest of my college career has been much healthier and happier than my first year. I am so glad the fitness course was a required class because I was able to correct my lifestyle before it spiraled out of control and I wasted more time in college. I started to exercise almost daily, and I learned so much about nutrition and healthy eating. Parties and alcohol were no longer important to me. I had a life to live and to prepare for. It felt so good to once again become fit and eat a healthy/balanced diet. I rearranged my activities so that schoolwork and fitness were right at the top of my list. I stopped procrastinating on my schoolwork, and I was doing cardio five times a week and lifting twice per week. My goal is to keep this up for the rest of my life. I now understand that if I want to enjoy wellness, I have to make fitness and healthy living a top priority in my life.



Personal Profile

General Understanding of Fitness and Wellness

To the best of your ability, answer the following questions. If you do not know the answer(s), this chapter will guide you through them.

- I. What have you done to make yourself aware of potential risk factors in your life that may increase your chances of developing disease? What do you know about your family's health history? Is there any other information that you feel you need to know?
- II. Do you know the top two leading causes of death in your age group? What steps do you take to protect yourself and set a good example for others?
- III. When are you most physically active throughout the day? Is there a season of the year or day of the week when you are most active? What can you do to become more active on a regular basis?
- IV. Of the seven dimensions of wellness, which dimension do you ignore most? Which dimension do you follow best?
- V. What steps are you taking toward financial wellness?

Take a moment to consider whether the choices from the past week, repeated over years, would accumulate to promote wellness or to cause disease. Your health is a product of complex

intertwined physical, mental, inherited, and environmental factors that directly influence your state of wellness. This book will help you navigate through the factors that influence your

behavior and will provide you with the necessary tools to make changes that are right for your life. We will begin this chapter by looking at the big picture and will then use a personalized approach throughout the book to help you create a program aimed at helping you develop a lifetime fitness and wellness lifestyle.

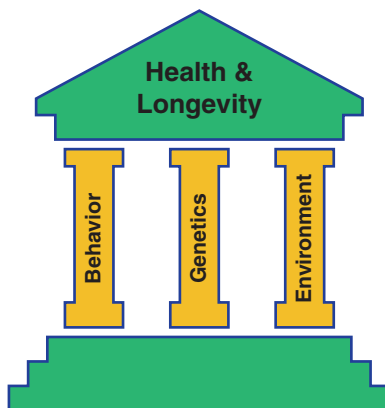
1.1 The Wellness Challenge for You Today

Three basic factors determine our health and longevity: genetics, the environment, and our behavior. In most cases, we cannot change our genetic circumstances, though the budding field of epigenetics is showing us that select genes can be switched on and off by lifestyle choices and environment. (For a more in-depth discussion on epigenetics see “Epigenetics” in Chapter 11.) We can certainly, however, exert control over the environment and our health behaviors so that we may reach our full physical potential based on our genetic code (see Figure 1.1).

At the beginning of the 20th century, **life expectancy** for a child born in the U.S. was only 47 years. The most common health problems in the Western world were infectious diseases, such as tuberculosis, diphtheria, influenza, kidney disease, polio, and other diseases of infancy. Progress in the medical field largely eliminated these diseases. Then, as more people started to enjoy the ease and excesses of modern life, we saw a parallel increase in the incidence of **chronic diseases** such as cardiovascular disease, cancer, diabetes, and chronic respiratory diseases (Figure 1.2).

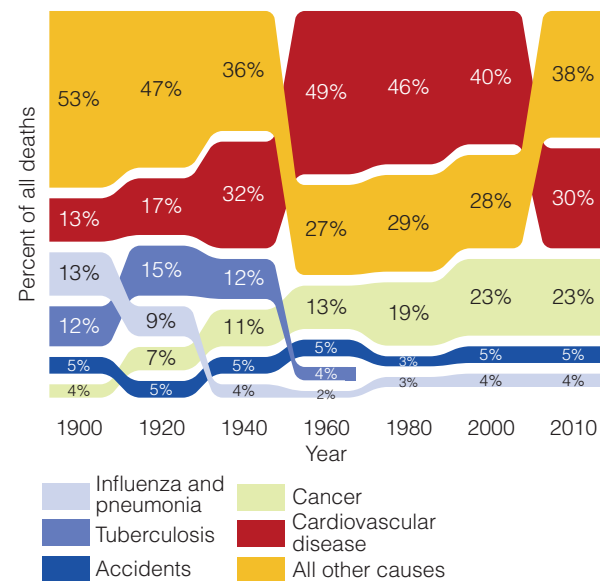
The underlying causes of death attributable to leading **risk factors** in the U.S. (Figure 1.3) indicate that most factors are related to the lifestyle choices we make. Based on estimates, more than half of disease is lifestyle related, a fifth is attributed to the environment, and a tenth is influenced by the health care the individual receives. Only 16 percent is related to genetic factors (Figure 1.4). Thus, the individual controls as much as 80 percent of his or her vulnerability to disease—and thus quality of life. In essence, most people in the U.S. are threatened by the very lives they lead today.

Figure 1.1 Factors that affect health and longevity.



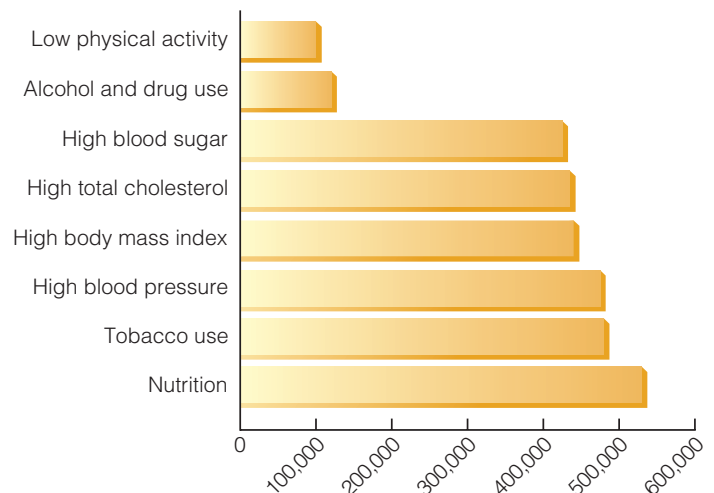
4 Lifetime Physical Fitness and Wellness: A Personalized Program

Figure 1.2 Causes of death in the U.S. for selected years.



SOURCE: National Center for Health Statistics, Division of Vital Statistics.

Figure 1.3 Estimated number of deaths attributable to lifestyle-related risk factors for men and women in the U.S.



SOURCE: C. J. L. Murray et al., “The State of US Health, 1990–2016: Burden of Disease, Injuries, and Risk Factors Among US States,” *Journal of the American Medical Association* 319 (2018): 1444–1472.

As our culture has adopted the ease of Western life, we have undergone profound cultural shifts at a rapid pace. By comparison, advances in past centuries were slow and gradual. Within the last century we have made wide-reaching changes like overhauling our diet to include more processed, refined, sugary, and unhealthy fatty foods. We have become increasingly **sedentary**. We have changed our social interactions so that we are now always online or “plugged in.” While it is impossible to completely tease out every cultural shift and its impact on health, we

know for certain that some take a heavy toll on our population's overall health and wellness. We will begin by examining one of the most impactful cultural shifts. Let's consider the recent history of physical activity.

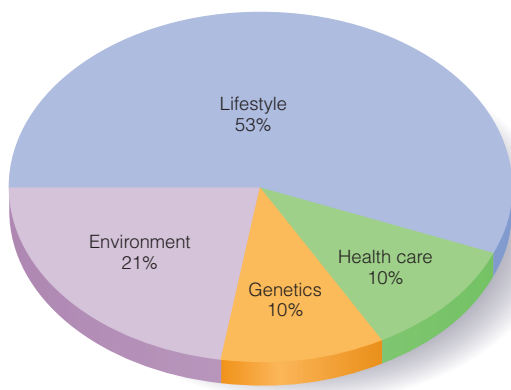
Movement is a basic function for which the human body was created, but advances in technology have almost completely eliminated the necessity for physical exertion in daily life. Scientific findings have shown that physical inactivity and a negative lifestyle seriously threaten health and hasten the deterioration rate of the human body. Most nations, both developed and developing, are experiencing an epidemic of physical inactivity. In the U.S., physical inactivity is the second greatest threat to public health (after tobacco use) and is often referenced in new concerns about *sitting disease*, **sedentary death syndrome (SeDS)**, and **hypokinetic diseases**.

As the populations of the world have adopted a more sedentary lifestyle, the world has seen a steep incline in obesity rates. Before 1980, obesity rates throughout the world remained relatively steady. Then, beginning in the 1980s, obesity rates started to grow rapidly, especially in the U.S., Australia, and England. Worldwide, obesity currently claims triple the number of victims as malnutrition. Overweight and obese people are now the majority in the 34 countries that make up the Organization for Economic Cooperation and Development (OECD).¹

Around the same time that incidence of chronic diseases climbed, we recognized that prevention is the best medicine. Consequently, a fitness and wellness movement developed gradually, beginning in the 1980s. Gyms and fitness centers as we know them began to be common across the country. People began to realize that good health is mostly self-controlled and that the leading causes of premature death and illness can be prevented by adhering to positive lifestyle habits.

Widespread interest in **health** and preventive medicine is motivating people to reexamine the foods they eat, incorporate more movement into activities of daily life, participate in organized fitness and wellness programs, and seek to reduce stress and increase well-being. We all desire to live a long life, and wellness programs aim to enhance the overall quality of life—for as long as we live.

Figure 1.4 Estimated impact of the factors that affect health and well-being.



1.2 Life Expectancy

Currently, the average life expectancy in the U.S. is 78.7 years (76.2 years for men and 81.2 years for women).² While the U.S. was once a world leader in life expectancy, over recent years, the increase in life expectancy in the U.S. has not kept pace with that of other developed countries. Based on 2018 data from the World Health Organization (WHO), the U.S. ranks 64th in the world for life expectancy (see Figure 1.5).³ Japan ranks first in the world with an overall life expectancy of 84.2 years.

Several factors may account for the current U.S. life expectancy ranking, including the extremely poor health of some groups. The U.S. also has fairly high levels of violence (notably, homicides), rates of traffic fatalities, and suicide rates.⁴ The current trend is a widening disparity between those in the U.S. with the highest and lowest life expectancy. For example, males in Fairfax County, Virginia, can expect to live as long as males in Japan, whereas those in Bolivar County, Mississippi, have the same life expectancy as males in countries with much lower life expectancies, like Pakistan. People with low socioeconomic status often lead more stressful lives, have more dangerous jobs, have less access to healthy food, are more likely to be exposed to environmental toxins, and live in neighborhoods that are not as safe or as conducive to physical activity. In addition to having lower life expectancy, people with low socioeconomic status spend more of their final years in disability. A healthy lifestyle, on average, adds 5 to 6 years of being disability free.⁵

The Gender Gap in Life Expectancy

Life expectancy for men in the U.S. is 5 years lower than for women. For years it had been assumed that the difference is based on biology, but we are learning that most likely the gender gap is related to lifestyle behaviors most commonly observed in men. Around 1980, the gender gap in life expectancy was almost 8 years. The decrease in the gender gap is thought to be due to the fact that women are increasingly taking on jobs, habits, and stressors of men, including drinking and employment outside the home. Women with heavy work schedules, however, are at

Life expectancy Number of years a person is expected to live based on the person's birth year.

Chronic diseases Illnesses that develop as a result of an unhealthy lifestyle and last a long time.

Risk factors Lifestyle and genetic variables that may lead to disease.

Sedentary Description of a person who is relatively inactive and whose lifestyle

is characterized by a lot of sitting.

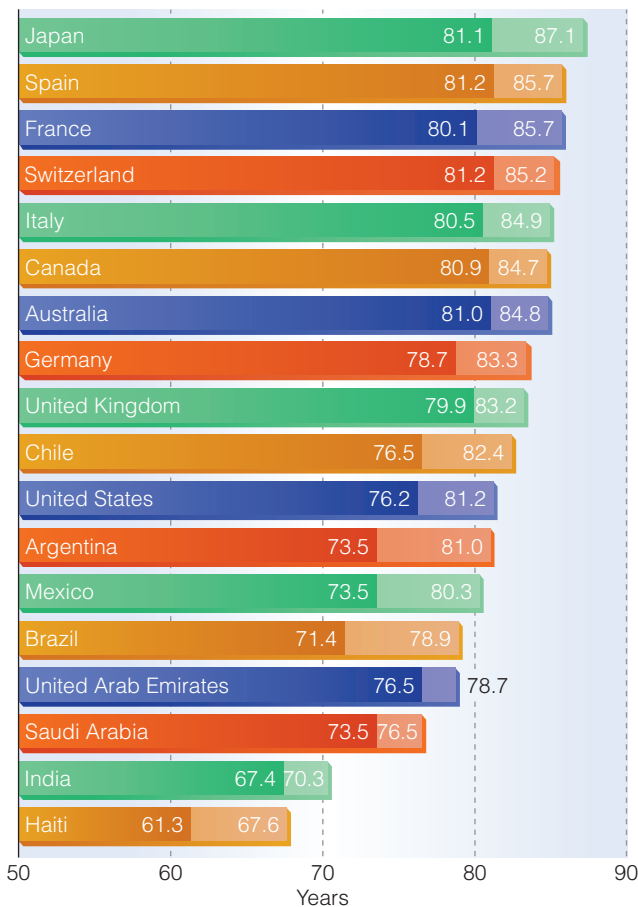
Sedentary death syndrome (SeDS) Cause of deaths attributed to a lack of regular physical activity.

Hypokinetic diseases *Hypo* denotes "lack of"; therefore, illnesses related to lack of physical activity.

Health State of complete well-being—not just the absence of disease or infirmity.

GLOSSARY

Figure 1.5 2018 life expectancy at birth for selected countries.



*Dark color is men; light color is women.

SOURCE: World Health Organization, "Life Expectancy and Healthy Life Expectancy. Data by country, 2018." <http://apps.who.int/gho/data/view.main.SDG2016LEXV?lang=en>; U. S. Department of Health and Human Services, Centers for Disease Control and Prevention, "Mortality in the United States, 2018," No. 355, January 2020.

higher risk than men who have similar work schedules when it comes to heart disease, cancer, and diabetes—most likely because women tend to take on additional stressors at home.⁶ Women and men are also becoming more similar to one another in their risk factors for heart disease, such as obesity and diabetes.

Men, nonetheless, still report higher stress on the job and are less likely to engage in stress management programs. Men also work in some of the most dangerous jobs (logging workers, fishers and related fishing workers, aircraft pilots and flight engineers, roofers). In terms of work-related deaths, the fatality rate for men is about ten times that of women.⁷ Furthermore, men's health is not given the same degree of attention in terms of public health policies. Thus, men need to take a more proactive role in managing their own health, yet, unfortunately, this can be hard for them.

"Masculinity" itself is also partially to blame. Studies have consistently shown that men are less likely to visit a physician when something is wrong and are less likely to have preventive care visits to be screened for potential risk factors such as

hypertension, elevated cholesterol, diabetes, obesity, substance abuse, and depression or anxiety.⁸ It is a troubling paradox, considering that men are at greater risk for each of the top risk factors for chronic disease. As a result, chronic diseases in men are often diagnosed at a later stage, when a cure or adequate management is more difficult to achieve. Men also drive faster than women and are more likely to engage in risk-taking activities.⁹

The Need to Prevent Disease, Not Only Cure It

The U.S. has not invested the same resources in preventing disease as it has in treating disease after onset. Ninety-five percent of our health care dollars are spent on treatment strategies, and less than 5 percent are spent on prevention. The latest data indicate that one in four adults in the U.S. have at least two chronic conditions and that most of these patients do not receive the preventative recommendations to avoid disease.¹⁰

A report by the OECD found that while the U.S. far outsports every other country in health care cost per capita, it also easily had the highest rates of obesity of all 34 OECD countries.¹¹ As a nation, we are seeing the consequences of these numbers unfold. Incidence of diabetes climbed dramatically in parallel step with the increased incidence of obesity.¹² Today, nearly half of the people in the U.S. have diabetes or prediabetes.¹³ Diabetes is the third most expensive chronic disease to treat, preceded only by heart disease and hypertension, respectively. All three of these chronic conditions are linked with obesity. Additional information on the obesity epidemic and its detrimental health consequences is given in Chapter 5.

1.3 Leading Health Problems in the U.S.

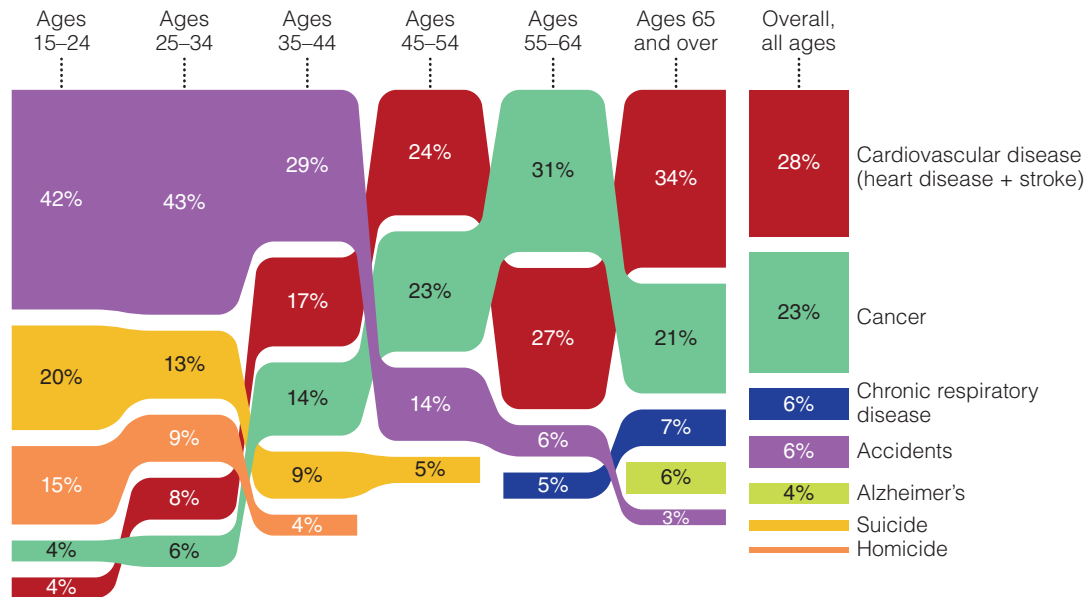
The leading causes of death in the U.S. today are largely related to lifestyle and personal choices (Figure 1.6). The U.S. Centers for Disease Control and Prevention have found that 7 of 10 Americans die of preventable chronic diseases. Specifically, about 52 percent of all deaths in the U.S. are caused by cardiovascular disease (30.4 percent) and cancer (21.3 percent). A majority of these deaths could be prevented through a healthy lifestyle program. The third and fourth leading causes of death across all age groups, respectively, are chronic lower respiratory disease and accidents (from the age of 1 to 44, accidents are the leading cause of death, with automobile accidents being the leading cause of death in the 5 to 24 age group).¹⁴

Hoeger Key To Wellness



Scientists believe that a healthy lifestyle program has the power to prevent almost 80 percent of deaths from cardiovascular disease and cancer.

Figure 1.6 Leading causes of death in the U.S. by age.



SOURCE: Centers for Disease Control and Prevention, "Deaths: Final Data for 2017"

Healthy Habits That Cut the Risk for Serious Disease

According to the Centers for Disease Control and Prevention, five health habits can reduce your risk of chronic diseases such as heart disease, cancer, and diabetes by almost 80 percent:

- Get at least 30 minutes of daily moderate-intensity physical activity.
- Don't ever smoke.
- Eat a healthy diet (ample fruits and vegetables, whole grain products, and low meat consumption).
- Maintain a body mass index (BMI) of less than 30.
- Reduce the amount of time you spend sitting each day.

Diseases of the Cardiovascular System

The most prevalent degenerative diseases in the U.S. are those of the cardiovascular system. The umbrella of **cardiovascular diseases** includes such conditions as **coronary heart disease (CHD)**, **heart attacks**, and **strokes** (sometimes referred to as brain attacks because like heart attacks, strokes occur when oxygen-rich blood is blocked from reaching cells). According to the American Heart Association (AHA), more than one in three adults in the U.S. are afflicted with diseases of the cardiovascular system, including hypertension (high blood pressure) and CHD. (Many of these people have more than one type of cardiovascular disease.) As we gained understanding of the effects of lifestyle on chronic disease, more people participated in wellness programs, and cardiovascular mortality rates dropped. The decline began in about 1963, and between 1969 and 2018, the incidence of heart disease dropped by approximately 70 percent and the incidence of stroke by about 80 percent.¹⁵ This decrease is credited to

Cardiovascular disease The array of conditions that affect the heart (cardio-) and the blood vessels (-vascular); often used interchangeably with the term *heart disease*. Under the cardiovascular disease umbrella are diseases including stroke and coronary heart disease (CHD). CHD, in turn, is an umbrella term for diseases that affect the heart and coronary arteries, which includes heart attacks.

Coronary heart disease (CHD) A disease in which plaque builds up in the arteries that supply blood to the

heart (these are the coronary arteries; the term "coronary" evolved from the word for "crown or wreath," referring to the arteries that circle the heart).

Heart attack Damage to an area of the myocardium (heart muscle) that is deprived of oxygen, usually due to blockage of a diseased coronary artery.

Stroke A condition in which a blood vessel that feeds the brain is clogged, leading to blood flow disruption to the brain. Sometimes referred to as a brain attack.

higher levels of wellness and better treatment modalities in the U.S. A complete cardiovascular disease prevention program is outlined in Chapter 10.

Cancer

The second overall leading cause of death in the U.S. is cancer. Cancer is closing the gap to soon become the leading cause of death in the U.S. One reason for this change may be that increased rates of obesity lead to increased risk for both cancer and cardiovascular disease, but treatment for cardiovascular disease is not as difficult and complex as cancer treatment. About 21 percent of all deaths in the U.S. are attributable to cancer.¹⁶

The major contributor to the increase in the incidence of cancer deaths during the past five decades is lung cancer, most of it caused by tobacco use. Furthermore, smoking accounts for almost 30 percent of all deaths from cancer. More than 30 percent of deaths are related to nutrition, physical inactivity, excessive body weight, and other faulty lifestyle habits.¹⁷

The American Cancer Society maintains that the most influential factor in fighting cancer today is prevention through health education programs. Lifestyle choices at a young age affect cancer risk throughout a lifetime. A comprehensive cancer-prevention program is presented in Chapter 11.

Chronic Lower Respiratory Disease

Chronic lower respiratory disease (CLRD), the third leading cause of death, is a general term that includes chronic obstructive pulmonary disease, emphysema, and chronic bronchitis (all diseases of the respiratory system). Although CLRD is related mostly to tobacco use (see Chapter 13 for discussion on how to stop smoking), lifetime nonsmokers also can develop CLRD.

Precautions to prevent CLRD include consuming a low-fat, low-sodium, nutrient-dense diet; staying physically active; not smoking and not breathing cigarette smoke; getting a pneumonia vaccine if older than age 50 and a current or ex-smoker; and avoiding swimming pools for individuals sensitive to chlorine vapor.

Accidents

Accidents are the fourth overall leading cause of death and the leading cause of death until age 44. Even though not all accidents are preventable, many are. Consider automobile accidents, the leading cause of death for teens. Across the U.S., fewer than 15 percent of people taking trips in automobiles choose not to wear seatbelts, yet these people account for half of all automobile deaths. As for the cause of automobile accidents themselves, fatal accidents are often related to failure to stay in the correct lane or yield the right of way due to driver distraction or alcohol use.¹⁸

Most people do not perceive accidents as a health problem. Even so, accidents affect the total well-being of millions of Americans each year. Accident prevention and personal safety are part of a health-enhancement program aimed at achieving a better quality of life. Hours spent exercising at the gym are of little help if the person is involved in a disabling or fatal accident as a result of distraction or making a single reckless decision.

Accidents do not just happen. We cause accidents, and we are victims of accidents. Although some factors in life, like natural disasters, are completely beyond our control, more often than not, personal safety and accident prevention are a matter of common sense. Most accidents stem from poor judgment and confused mental states, which occur when people are upset, mentally spent, not paying attention to the task at hand, trying to do too much at once, or abusing alcohol or other drugs.

With the advent of cell phones, distracted driving accidents have climbed. For teens specifically, more than half of all moderate to severe automobile accidents result from driver distraction.¹⁹ Research utilizing brain imaging has uncovered the cognitive workload and collision risk during multiple driving scenarios (see “Distracted Driving”).

Alcohol abuse is the number one overall cause of all accidents. About half of accidental deaths and suicides in the U.S. are alcohol related. Further, alcohol intoxication remains the leading cause of fatal automobile accidents in the U.S. by taking the lives of 30 people every day. Other commonly abused drugs alter feelings and perceptions, generate mental confusion, and impair judgment and coordination, greatly enhancing the risk for accidental **morbidity** (Chapter 13).

Medical Error in U.S. Hospitals: An Untracked Mortality Risk

Recently, attention been brought to the number of deaths that are a direct result of medical error in U.S. hospitals. When cause of death is recorded by the Centers for Disease Control and Prevention (CDC), medical error is not offered as an option; however, an estimated 250,000 each year are the result of a mistake of omission or commission by medical workers.²⁰ While nothing can guarantee perfect medical care, it is ideal for every hospitalized patient to have an attentive and vocal advocate, and of course to lead a wellness lifestyle to avoid preventable health complications in the first place.

1.4 Physical Activity Affects Health and Quality of Life

Among the benefits of regular physical activity and exercise are a significant reduction in premature mortality and decreased risks for developing heart disease, stroke, metabolic syndrome, type 2 diabetes, obesity, osteoporosis, colon and breast cancers, high blood pressure, depression, and even dementia and Alzheimer's. But we did not always understand the relationship between physical activity and mortality rates, in particular, the dose-response relationship.

During the second half of the 20th century, scientists began to realize the importance of good fitness and improved lifestyle in the fight against chronic diseases, particularly those of the cardiovascular system. Because of more participation in wellness programs, cardiovascular mortality rates dropped.

Distracted Driving

Automobile accidents are the number one cause of death for teens in the U.S. Studies on distracted driving have used new technology, including real-time brain imaging, to offer new insight about protecting ourselves behind the wheel. Following are insights for drivers.

1. *Listening to the radio is nearly as safe as driving with no distractions.*
2. *Having a cell phone conversation increases collision incidence. The risk is identical for a hands-free device and a handheld phone.*
3. *Having a cell phone conversation causes the brain to screen out 50 percent of visual cues.* The ability to look directly at but not “see” an object is termed “inattention blindness.” It is not uncommon for a distracted driver running a red light to collide with the second or third car in an intersection, having not “seen” the first cars. Talking on a phone while driving decreases reaction time to pedestrians in a crosswalk.
4. *Having a conversation with an adult passenger is safer than having a conversation on a cell phone.* Passengers who are experienced drivers help the driver by pausing conversation and by pointing out cues as needed. For a teen driver, the incidence of collision resulting in death increases with the number of teen passengers.
5. *Though crash risk is lower when talking with a passenger, cognitive workload can be the same as when talking on a cell phone.* Topic of conversation and emotional involvement affect safety in both types of conversation.
6. *The brain does not multitask but rather switches attention between tasks.* Some dual tasks do not cause a problem; others do. When driving and holding a conversation, the brain often recognizes conversation as the primary task. Switching is a complex process that requires events to be committed to short-term memory before they can be “encoded,” the stage when the brain chooses what to “see.” It is not uncommon for switching time to be tenths of a second, the difference of several car lengths when braking. This is termed “reaction time switching costs.”
7. *The brain remains somewhat distracted for up to 27 seconds following a phone conversation, text, or voice technology interaction.^a*

Furthermore, several landmark studies showed an inverse relationship between physical activity and premature mortality rates. The first major study in this area was conducted in the 1980s among 16,936 Harvard alumni, and the results linked physical activity habits and mortality rates.²¹ As the amount of weekly physical activity increased, the risk for cardiovascular deaths decreased.

8. *Because the majority of trips do not involve a situation that requires split-second timing, drivers can gain a false sense of security about being able to multitask.*
9. *Making a left turn while talking on a cell phone or hands-free device is among the most dangerous driving activities.*
10. *Reaching for a moving object or turning in your seat increases collision incidence by eight to nine times.*
11. *Texting while driving increases collision incidence by 16 times.* Compared with texting, talking on a cell phone is done by drivers more frequently for longer lengths of time, and so is the cause of more deaths than texting is. Consider using your phone’s do-not-disturb setting or an app that blocks texting while driving. Because our minds are social and curious, we find text alerts difficult to ignore. Pedestrians who are distracted by their phones also increase their chances of incurring a car accident on the street.
12. *Sleepy drivers kill more than half as many Americans as drunk drivers.* More than 6,000 people die each year in the U.S. in crashes attributed to drowsy drivers. In comparison, roughly 10,000 people die each year because of drunk or buzzed driving.
13. *Parents driving children are just as likely to talk on the phone and use distractions, including navigation systems, as other drivers.^b*



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We cannot control what information our brain chooses to encode and screen out while driving. We can control our decision to use a cell phone or to speak up when a driver is putting passengers in danger.

^a“Up to 27 Seconds of Inattention After Talking to Your Car or Smartphone,” The University of Utah UNews, October 27, 2015. Available at <http://unews.utah.edu/up-to-27-seconds-of-inattention-after-talking-to-your-car-or-smart-phone/>.

^bMichelle L. Macy, Patrick M. Carter, C. Raymond Bingham, Rebecca M. Cunningham, and Gary L. Freed, “Potential Distractions and Unsafe Driving Behaviors Among Drivers of 1- to 12-Year-Old Children,” *Academic Pediatrics* 14, no. 3 (2014): 279.

Morbidity A condition related to or caused by illness or disease.