

Sixteenth Edition

# Connect Core Concepts in HEALTH

BRIEF





# CONNECT CORE CONCEPTS IN HEALTH

**Brief**

SIXTEENTH EDITION

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## CONNECT CORE CONCEPTS IN HEALTH: BRIEF, SIXTEENTH EDITION

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# PROVEN, SCIENCE-BASED CONTENT

Now in its Sixteenth Edition, *Connect Core Concepts in Health* is written by experts who work and teach in the fields of exercise science, medicine, physical education, and health education. *Connect Core Concepts in Health* provides accurate, reliable, and current information on key health and wellness topics while also addressing issues related to mind-body health, research, diversity, and consumer health.

McGraw-Hill Education's digital and teaching learning tools are built on the solid foundation of *Connect Core Concepts in Health's* authoritative, science-based content. The Sixteenth Edition maintains important features on behavior change, personal reflection, critical thinking, and other key content and skills as well as the latest research, statistics, and a new chapter on sleep.

**Take Charge** challenges students to take meaningful action toward personal improvement.

**Critical Consumer** helps students to navigate the numerous and diverse set of health-related products currently available.

**Diversity Matters** discusses the ways that our personal backgrounds influence our health strengths, risks, and behaviors.

**Wellness on Campus** focuses on health issues, challenges, and opportunities that students are likely to encounter on a regular basis.

**Behavior Change Strategy** offers specific behavior management/modification plans related to the chapter topic.

**Ask Yourself: Questions for Critical Thinking and Reflection** encourages critical reflection on students' own health-related behaviors.

**Quick Stats** focuses attention on particularly striking statistics related to the chapter content.

**Tips for Today and the Future** ends each chapter with a quick, bulleted list of concrete actions reader can take now and in the near future.

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**McGraw-Hill Education Connect<sup>®</sup>** is a digital teaching and learning environment that improves performance over a variety of critical outcomes; it is easy to use; and proven effective. Connect empowers students by continually adapting to deliver precisely what they need, when they need it, and how they need it, so your class time is more engaging and effective. Connect Personal Health offers a wealth of interactive online content, including health labs and self-assessments, video activities on timely health topics, and practice quizzes with immediate feedback.

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New to this edition, SmartBook is now optimized for phones and tablets. Its interactive features are also accessible for students with disabilities. Just like our new ebook and ReadAnywhere app, SmartBook is available both online and offline.

Using Food Labels

1 2

### WELLNESS WORKSHEET

#### Informed Food Choices

Be sure to complete all portions of the lab. There are two parts, appearing on two separate screens. Once you complete all content in a particular part, you will be able to navigate to the next screen using the navigation map at the top or bottom of the activity.

#### USING FOOD LABELS

Choose three food items to evaluate. You might want to select three similar items, such as regular, low-fat, and fat-free salad dressing, or three very different items. Record the information from their food labels in the table below.

To receive an initial score of complete, fill out all fields in the table. Enter a zero (0) in a field if a food does not contain a particular nutrient. Enter only whole numbers and decimals in the log. For example, enter a half gram of dietary fiber as 0.5, not 1/2.

Food Items			
Serving size			

### Physical Responses to Stressors

Imagine a close call: As you step off the curb, a car careens toward you. With just a fraction of a second to spare, you leap safely out of harm's way. In that split second of danger and in the moments following it, you experience a predictable series of physical reactions. Your body goes from a relaxed state to one prepared for physical action to cope with a threat to your life.

Two systems in your body are responsible for your physical response to stressors: the nervous system and the endocrine system. Through rapid chemical reactions affecting almost every part of your body, you are primed to act quickly and appropriately in time of danger.

#### The Nervous System

The **nervous system** consists of the brain, spinal cord, and nerves. Part of the nervous system is under voluntary control, as when you tell your arm to reach for a chocolate. The part that is *not* under conscious supervision—for example, the part that controls the digestion of the chocolate—is the **autonomic nervous system**. In addition to digestion, it controls your heart rate, breathing, blood pressure, and hundreds of other involuntary functions. The autonomic nervous system consists of two divisions:

- The **parasympathetic division** is in control when you are relaxed. It aids in digesting food, storing energy, and promoting growth.
- The **sympathetic division** is activated when your body is stimulated, for example, by exercise, and when there is an emergency, such as severe pain, anger, or fear.

#### Endocrine System

As a group, these nearly instantaneous physiological changes are called the **fight-or-flight reaction**. changes give you the heightened reflexes and strength.

#### stress response

The physical and emotional reactions to a stressor.

#### stress

The general physical and emotional state that the stressor produces.

#### nervous system

The brain, spinal cord, and nerves.

#### autonomic nervous system

The part of the nervous system that controls certain basic body processes; consists of the sympathetic and parasympathetic divisions.

#### parasympathetic division

The part of the autonomic nervous system that moderates the excitatory effect of the sympathetic division, slowing metabolism and restoring energy supplies.

#### sympathetic division

Division of the autonomic nervous system that reacts to danger or other challenges by accelerating body processes.

#### endocrine system

The system of glands, tissues, and organs that secrete hormones into the bloodstream to influence metabolism and other body processes.

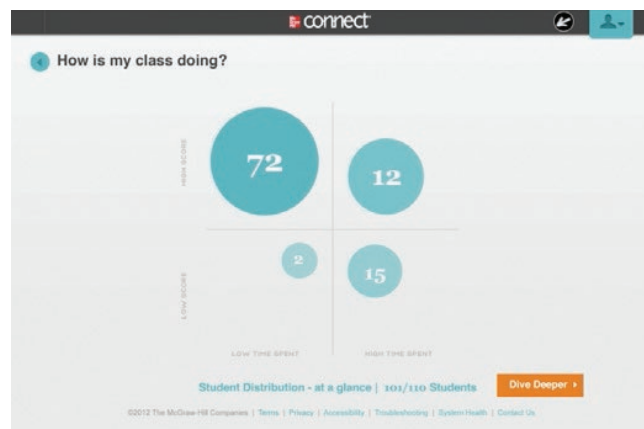
#### hormone

A chemical messenger produced in the body and transported in the bloodstream to target cells or organs for specific regulation of their activities.

# ADVANCED REPORTING



**Connect Insight®** is Connect's one-of-a-kind visual analytics dashboard—available for both instructors and students—that provides at-a-glance information regarding student performance, which is immediately actionable. By presenting assignment, assessment, and topical performance results together with a time metric that is easily visible for aggregate or individual results, Connect Insight gives the user the capability to take a just-in-time approach to teaching and learning, which was never before available. Connect Insight presents data that empower students and help instructors improve class performance in a way that is efficient and effective.





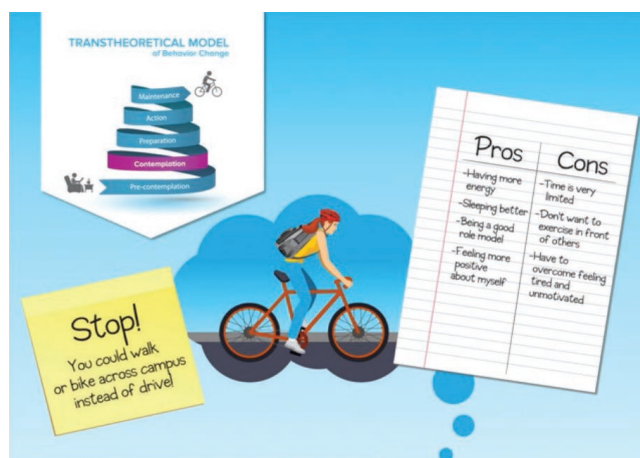
# WHAT'S NEW IN CONNECT CORE CONCEPTS IN HEALTH BRIEF EDITION, SIXTEENTH EDITION?

The Sixteenth Edition focuses on the following: new digital assets in Connect designed to help students succeed in the course, a new sleep chapter, and other current chapter content changes informed by student data.

## NEW DIGITAL ASSETS IN CONNECT

New to this edition are assignable and assessable **Concept Clips**, which help students master key personal health concepts. Using colorful animation and easy-to-understand audio narration, Concept Clips provide step-by-step presentations to promote student comprehension. Topics include the stages of change model, diabetes types and metabolism, changes to the Nutrition Facts label, the cardiorespiratory system, and the stress response.

Also new are **NewsFlash** activities, which tie current news stories to key personal health concepts. After interacting with a contemporary news story, students are assessed on their understanding and their ability to make the connections between real-life events and course content. Examples of NewsFlash include topics such as hands-only CPR, reducing sun damage, and vaccination rates.



## NEW SLEEP CHAPTER

A new chapter on sleep covers a comprehensive discussion of sleep stages, cycles, and drives; sleep across the life span; and the relationship between sleep and health. In addition, the chapter provides guidance for identifying sleep disrupters and addressing the social and biological influences on sleep.

**CHAPTER OBJECTIVES**

- Identify the three stages of sleep
- Understand how to apply good sleep habits
- Explain the health-related benefits of sleep and the consequences of disrupted sleep
- Understand changing sleep needs throughout the life span
- List common sleep disorders, their symptoms, and their treatments
- Understand the natural pattern of sleepiness and alertness throughout the day
- Understand sleep disrupters and how to reduce their effects

**Sleep**

**CHAPTER 4**

## CHAPTER-BY-CHAPTER CHANGES—INFORMED BY STUDENT DATA

The authors revised in response to student heat-map data derived from SmartBook that pinpointed the topics and concepts that students struggle with the most. This heat map-directed revision is reflected primarily in Chapters 7, 9, 11, and 14.

### Chapter 1: Taking Charge of Your Health

- New discussion of life span and life expectancy, including major genetic, environmental, and lifestyle factors.
- Updated explanation of the Affordable Care Act and changes to health care law.
- Expanded discussion of how to select health insurance, with a focus on the importance of the 10 essential benefits.
- Improved overview of environmental health factors.

- Updated “Vital Statistics” about public health, lifestyle factors, leading causes of death, and life expectancy.

## **Chapter 2: Stress: The Constant Challenge**

- Enhanced discussion of personality and resilience.
- Revised explanations of the general adaptation syndrome and allostatic load.
- Updated discussion of the impact of stress on physical health.
- New discussions of social stressors, including the impact of digital technology, social media, and challenging social situations.
- New sections covering traumatic stressors and biofeedback.

## **Chapter 3: Psychological Health**

- Updated discussion of developing a unified sense of self.
- Revised discussion of ethnicity, culture, and psychological self, including the topics of hybrid identity and multiculturalism.

## **Chapter 4: Sleep**

- New chapter on sleep includes comprehensive discussion of sleep stages, cycles, and drives; sleep across the life span; sleep disorders, including insomnia, restless leg syndrome, sleep apnea, and narcolepsy; and the relationship between sleep and health.
- It also provides three detailed steps and accompanying tools to help students adopt a healthy sleep program.
- Includes guidance for identifying sleep disrupters and addressing social and biological influences on sleep.

## **Chapter 5: Intimate Relationships and Communication**

- Updated discussion of social media and digital communication.
- Updated data on marriage, singlehood, and family living arrangements and related attitudes.

## **Chapter 6: Sexuality, Pregnancy, and Childbirth**

- New content to address a spectrum of gender identities.
- New “Diversity Matters” box explores current, accepted language for genders and new discussion of transgender versus cisgender people.
- Updated section about gender roles and sexual orientation.
- Updated discussions of puberty, andropause, and sexual dysfunctions.
- Updated data on the costs to raise a child.
- Revised discussion of pluripotency and the first trimester.
- Updated discussion of guidelines and recommendations for physical activity during pregnancy.

## **Chapter 7: Contraception and Abortion**

- Updated discussion of the relationship between unplanned pregnancy and college dropout rates.
- Updated discussion of long-acting reversible contraception and short-acting reversible contraception, including revised side effects and risks of oral contraceptives.
- Updated data on pregnancy, birth, and abortion rates, as well as data on women’s age and gestation period.
- Updated discussion of potential physical effects of abortion and legality of abortion procedures.

## **Chapter 8: Drug Use and Addiction**

- Updated “Vital Statistics” on nonmedical drug use.
- Revised discussion of the APA’s definition of addiction and the preferred terms.
- New information about the heroin and opioid epidemic, including an updated discussion of syringe-exchange programs and college-aid opioid users. Updated overdose and use addiction data.
- New discussion of kratom, a stimulant used to aid opioid withdrawal.

## **Chapter 9: Alcohol and Tobacco**

- New material on alcoholic energy drinks and the effects of combining caffeine and alcohol.
- Updated data on alcohol-related deaths, trends, and risk factors.
- Expanded data and discussion of young adult and LGBT tobacco use and trends.
- Updated discussion of hookah and smokeless tobacco, including snuff, snus, lozenges, and chewing tobacco.
- Added discussion of thirdhand smoke, including the toxicity, sources, and effects of tobacco residue.
- Updated discussion of the effects of smoking bans, cigarette taxes, and warning labels, including new references and updated data. New material on FDA regulations introduced in 2018.
- Updated information on cigarette-industry lobbying and political funding.

## **Chapter 10: Nutrition Basics**

- Updated information about shelf-stable and processed foods, including those containing hydrogenated oils, saturated fats, and trans fats.
- Expanded discussion of vegetarian and plant-based diets.
- Updated information on new nutrition labels, including an explanation of changes regarding added sugars, calories from fat, nutrient daily values, serving sizes.

### **Chapter 11: Exercise for Health and Fitness**

- Expanded discussion of the FITTP model of exercise, which includes the significance of frequency, intensity, time, type, and progression of physical activity.
- Updated discussion of how individual differences influence physical fitness, body composition, and exercise capacity.

### **Chapter 12: Weight Management**

- Updated data on the prevalence of obesity, the frequency of physical activity in the United States.
- Revised explanation of how body fat and body composition can differ among individuals and how this can be assessed.
- Updated discussion of how hormones leptin and ghrelin influence appetite and body weight.

### **Chapter 13: Cardiovascular Health and Cancer**

- Updated discussion of cardiovascular disease, including symptoms, types, prevalence, and risk factors.
- Revised material on blood pressure readings to account for new guidelines and thresholds for elevated blood pressure and hypotension. Includes a discussion of how the new guidelines and targets affect public health trends.
- Updated discussion of the relationship between smoking rates and cancer death rates; updated data. Explanation of what this trend suggests and updated “Vital Statistics” about different types of cancer attributed to smoking.
- Revised explanation of PSA screening for prostate cancer, including how the test works, why it is controversial, and when it is appropriate.
- Updated discussion of specialized and experimental treatments, including immunotherapies, hormone therapies, and stem cell transplants. New discussion of targeted therapy, liquid biopsies, and the relationship between cancer and oxygen.

### **Chapter 14: Immunity and Infection**

- Updated discussion of the different cell types in the immune system, including a new figure illustrating how antigens and immune cells work.
- Updated discussion of contagion, including an explanation of symptomatic and asymptomatic states.
- New material explaining the microbiome and the significance of gut microbiota.
- Updated information on vaccination, including for influenza, shingles, and hepatitis A and B.

- New information about the dangers of the raw water movement and the efficacy of the Safe Drinking Water Act and modern water treatment.
- Updated information about malaria, toxoplasmosis, and West Nile virus.
- Updated “Vital Statistics” on STI cases estimated annually. Updated prevalence data among high-risk groups and data on HIV-status awareness. New information about preexposure prophylaxis (PrEP).
- Updated chlamydia symptoms and treatment for epididymitis and proctitis. New section about lymphogranuloma venereum (LGV) and trichomoniasis.
- Revised content on hepatitis C, including risk, public health trends, and history.

### **Chapter 15: Environmental Health**

- Updated section on climate change and atmospheric ozone, including global political events, such as the U.S. withdrawal from the Paris Agreement.
- Updated information on water safety and efficiency, including a discussion of the Flint, Michigan, water crisis and the Cape Town, South Africa, water shortage.
- New information about the risks of pesticide exposure and the differences between organic and conventional produce.

### **Chapter 16: Conventional and Complementary Medicine**

- Revised information about alternative medical treatments, including yoga, chiropractic, acupuncture, and other therapies. Includes updated trends on U.S. spending on complementary health approaches.
- Revised section on insurance and ACA coverage of complementary and alternative medicines (CAMs) and therapies.

### **Chapter 17: Personal Safety**

- Updated content on the effects of prescription and over-the-counter medications and marijuana on driving. New material on the effects of drugs and alcohol on pedestrian behavior and safety.
- Revised section on defensive driving strategies.
- Updated information on workplace injuries and illnesses. New supporting statistics.
- New information about sexual abuse and risks on college campuses, including the role of peer support and misogyny.
- Updated content on hate crimes and the role of race in killings. New information on school violence and gun violence, including updated statistics.

## Chapter 18: The Challenge of Aging

- Updated explanation of the different types of aging humans experience (including biological, psychological, and social aging). Includes examples of these experiences and a discussion of their effects.
- Revised discussion of physical activity guidelines for different life stages.
- Revised discussion of chronic diseases in common among elderly people, including updated prevalence rates.
- New section about cognitive impairment, including updated material on Alzheimer's disease, vascular dementia, and Lewy-body dementia. Includes symptoms, prevalence rates, and risk factors for each.
- Updated statistics about poverty, lifestyle risks, and education levels among older adults.
- Revised explanation of advance directives, living wills, and health care proxies, including guidelines for when each is appropriate and how to create them. Revised material about organ donation.



# YOUR COURSE, YOUR WAY



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## INSTRUCTOR RESOURCES

Instructor resources available through Connect for *Connect Core Concepts in Health Brief Edition* include a Test Bank, Image Bank, and PowerPoint presentations for each chapter. All test questions are available within TestGen™ software. PowerPoint presentations are now WCAG compliant.

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# Taking Charge of Your Health

## CHAPTER OBJECTIVES

- Define wellness as a health goal
- Explain two major efforts to promote national health
- List factors that influence wellness
- Explain methods for achieving wellness through lifestyle management
- List ways to promote lifelong wellness for yourself and your environment

## CHAPTER

# 1

**T**he next time you ask someone, “How are you?” and you get the automatic response “Fine,” be grateful. If that person had told you how he or she actually felt—physically, emotionally, mentally—you might wish you had never asked. Your friend might be one of the too many people who live most of their lives feeling no better than just all right, or so-so, or downright miserable. Some do not even know what optimal wellness is. How many people do you know who feel great most of the time? Do you?

## WELLNESS AS A HEALTH GOAL

Generations of people have viewed good health simply as the absence of disease, and that view largely prevails today. The word **health** typically refers to the overall condition of a person’s body or mind and to the presence or absence of illness or injury. **Wellness** expands this idea of good health to include living a rich, meaningful, and energetic life. Beyond the simple presence or absence of disease, wellness can refer to optimal health and vitality—to living life to its fullest. Although we use the words *health* and *wellness* interchangeably, they differ in two important ways. *Health* can be determined

or influenced by factors beyond our control, such as our genes, age, and family history. Wellness is determined largely by the conscious decisions we make about how we live. These decisions affect the risk factors that contribute to disease or injury. We cannot control **risk factors** such as age and family history, but we can control lifestyle behaviors.

## Dimensions of Wellness

The process of achieving wellness is continuing and dynamic. Figure 1.1 lists specific qualities and behaviors associated with the nine dimensions of wellness.

**Physical Wellness** Your physical wellness includes not just your body’s overall condition and the absence of disease

**health** The overall condition of body or mind and the presence or absence of illness or injury.

**wellness** Optimal health and vitality, encompassing all the dimensions of well-being.

**risk factor** A condition that increases your chances of disease or injury.

### TERMS





**FIGURE 1.1** Qualities and behaviors associated with the dimensions of wellness. Carefully review each dimension and consider your personal wellness strengths and weaknesses.

but also your fitness level and your ability to care for yourself. The higher your fitness level, the higher your level of physical wellness. Similarly, as you develop the ability to take care of your own physical needs, you ensure greater physical wellness. The decisions you make now, and the habits you develop over your lifetime, will determine the length and quality of your life.

**Emotional Wellness** Trust, self-confidence, optimism, satisfying relationships, and self-esteem are some of the qualities of emotional wellness. Emotional wellness is dynamic and involves the ups and downs of living. It fluctuates with your intellectual, physical, spiritual, cultural, and interpersonal health. Maintaining emotional wellness requires exploring thoughts and feelings. *Self-acceptance* is your personal satisfaction with yourself—it might exclude society's expectations—whereas *self-esteem* relates to the way you think others perceive you; *self-confidence* can be a part of both acceptance and esteem. Achieving emotional wellness means finding solutions to emotional problems, with professional help if necessary.

**Intellectual Wellness** Those who enjoy intellectual wellness continually challenge their minds. An active mind is essential to wellness because it detects problems, finds solutions, and directs behavior. Often they discover new things about themselves.

**Interpersonal Wellness** Satisfying and supportive relationships are important to physical and emotional wellness. Learning good communication skills, developing the capacity for intimacy, and cultivating a supportive network are all important to interpersonal (or social) wellness. Social wellness requires participating in and contributing to your community and to society.

**Cultural Wellness** Cultural wellness refers to the way you interact with others who are different from you in terms of ethnicity, religion, gender, sexual orientation, age, and customs. It involves creating relationships with others and suspending judgment of others' behavior until you have "walked in their shoes." It also includes accepting and valuing the different cultural ways people interact in the world. The extent to which you maintain and value cultural identities is one measure of cultural wellness.

**Spiritual Wellness** To enjoy spiritual wellness is to possess a set of guiding beliefs, principles, or values that give meaning and purpose to your life, especially in difficult times. The spiritually well person focuses on the positive aspects of life and finds spirituality to be an antidote for negative feelings such as cynicism, anger, and pessimism. Organized religions help many people develop spiritual health. Religion, however, is not the only source or form of spiritual wellness.

Many people find meaning and purpose in their lives through their loved ones or on their own—through nature, art, meditation, or good works.

**Environmental Wellness** Your environmental wellness is defined by the livability of your surroundings. Personal health depends on the health of the planet—from the safety of the food supply to the degree of violence in society. To improve your environmental wellness, you can learn about and protect yourself against hazards in your surroundings and work to make your world a cleaner and safer place.

**Financial Wellness** Financial wellness refers to your ability to live within your means and manage your money in a way that gives you peace of mind. It includes balancing your income and expenses, staying out of debt, saving for the future, and understanding your emotions about money. See the “Financial Wellness” box.

**Occupational Wellness** Occupational wellness refers to the level of happiness and fulfillment you gain through your work. Although high salaries and prestigious titles are gratifying, they alone may not bring about occupational wellness. An occupationally well person enjoys his or her work, feels a connection with others in the workplace, and takes advantage of the opportunities to learn and be challenged. Another important aspect of occupational wellness is recognition from managers and colleagues. An ideal job draws on your interests and passions, as well as your vocational skills, and allows you to feel that you are making a contribution in your everyday work.

## The Long and the Short of Life Expectancy

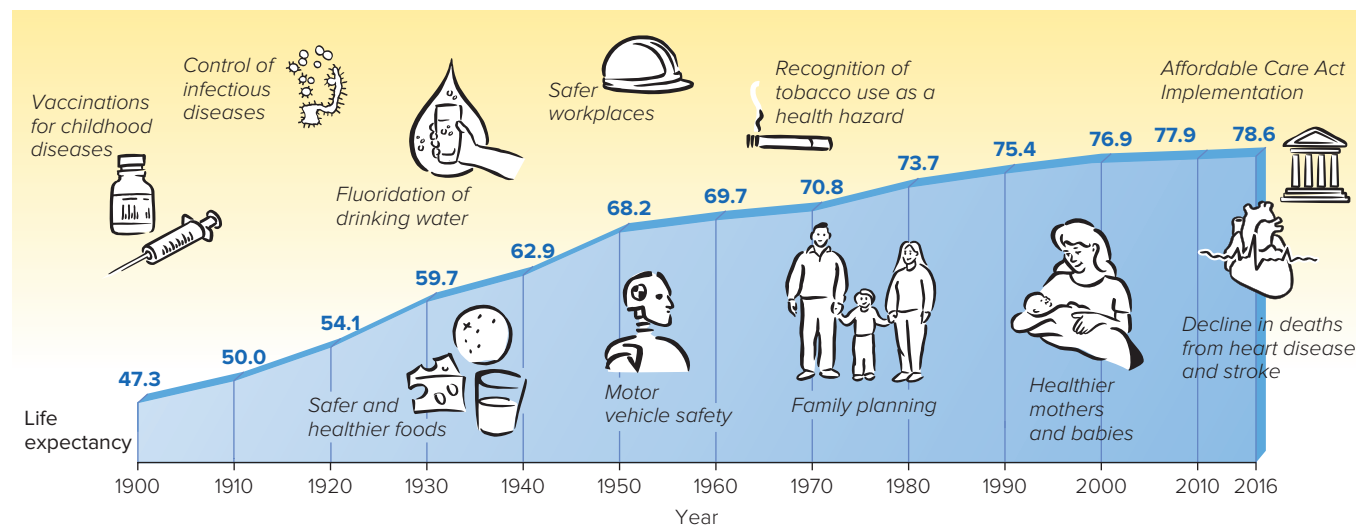
Studies suggest that our genes can determine up to 25% of the variability in life span. A new study found correlations among genes, behavior, and how long we might expect to live. Researchers have found that the strongest correlations between genes and mortality are susceptibility to coronary artery disease and modifiable behaviors such as cigarette smoking. Also correlated to a shorter life span are obesity, susceptibility to lung cancer, and insulin resistance.

Why does education help us live longer? Consider smoking to understand the effect of education on life span. People with more education smoke less, so they have a lowered risk for lung cancer. For example, smoking a pack of cigarettes per day over 20 years reduces **life expectancy** by seven years. Each year spent in higher education correlates to an additional year of life.

Other factors, such as obesity and drug use, also strongly correlate to life span. For every extra kilogram people carry, they cut their life expectancy by two months. (See the box “Life Expectancy and the Obesity Epidemic.”) In 2016, there were over 63,600 drug-related deaths, two-thirds of which were caused by opioids. Researchers believe that the opioid epidemic and the obesity epidemic, which began in the 1970s, have contributed to a declining American life expectancy for two consecutive years (Figure 1.2).

**life expectancy** The period of time a member of a given population is expected to live.

### TERMS



**FIGURE 1.2 Public health, life expectancy, and quality of life.** Public health achievements during the 20th century are credited with adding more than 25 years to life expectancy for Americans, greatly improving quality of life, and dramatically reducing deaths from infectious diseases. Public health improvements continue into the 21st century, including greater roadway safety and a steep decline in childhood lead poisoning. In 2016 and 2017, U.S. life expectancy declined, likely due to the opioid and obesity epidemics.

**SOURCES:** Centers for Disease Control and Prevention. 2011. Ten great public health achievements—United States, 2001–2010. *MMWR* 60(19): 619–623; Centers for Disease Control and Prevention. 1999. Ten great public health achievements—United States, 1900–1999. *MMWR* 48(50): 1141; Centers for Disease Control and Prevention. 2017. *Fatal Injury Data: Leading Causes of Death 1981–2016* (<https://www.cdc.gov/injury/wisqars/index.html>).



## TAKE CHARGE

### Financial Wellness

Researchers surveyed nearly 90,000 college students about their financial behaviors and attitudes. According to results released in 2016, a large percentage of students feel less prepared to manage their money than to handle almost any other aspect of college life. They also express

distress over their current and future financial decisions. Front and center in their minds is how to manage student loan debt. *Financial wellness* means having a healthy relationship with money. Here are strategies for establishing that relationship:

#### Follow a Budget

A budget is a way of tracking where your money goes and making sure you're spending it on the things that are most important to you. To start one, list your monthly income and expenditures. If you aren't sure where you spend your money, track your expenses for a few weeks or a month. Then organize them into categories, such as housing, food, transportation, entertainment, services, personal care, clothes, books and school supplies, health care, credit card and loan payments, and miscellaneous. Knowing where your money goes is the first step in gaining control of it.

Now total your income and expenditures and examine your spending patterns. Use this information to set guidelines and goals for yourself. If your expenses exceed your income, identify ways to make some cuts. For example, if you spend money going out at night, consider less expensive options like having a weekly game night with friends or organizing an occasional potluck.

#### Be Wary of Credit Cards

Students have easy access to credit but little training in finances. An increase in credit card use has correlated with an increase in paying credit card bills late, paying only the minimum amount, and having larger total outstanding credit balances.

Shifting away from using credit cards and toward using debit cards is a good strategy for staying out of debt. Familiarity with financial terminology helps as well. Basic financial literacy with regard to credit cards involves understanding terms like *APR* (annual percentage rate—the interest you're charged on your balance), *credit limit* (the maximum amount you can borrow), *minimum monthly payment* (the smallest payment your creditor will accept each month), *grace period* (the number of days you have to pay your bill before interest or penalties are charged), and *over-the-limit* and *late fees* (the amounts you'll be charged if you go over your credit limit or your payment is late).

#### Manage Your Debt

One-fifth of students with a debt are behind on their payments. When it comes to student loans, having a direct, personal plan for repayment can save time and money, reduce stress, and help you prepare for the future.

However, only about 10% of students surveyed feel they have all the information needed to pay off their loans. Work with your lender and make sure you know how to access your balance, when to start repayment, how to make payments, what your repayment plan options are, and what to do if you have trouble making payments. Information on managing federal student loans is available from <https://studentaid.ed.gov/sa/>.

If you have credit card debt, stop using your cards and start paying them off. If you can't pay the whole balance, try to pay more than the minimum payment each month. It can take a very long time to pay off a loan by making only the minimum payments. For example, paying off a credit card balance of \$2000 at 10% interest with monthly payments of \$20 would take 203 months—nearly 17 years. Check out an online credit card calculator like <http://money.cnn.com/calculator/pf/debt-free/>. If you carry a balance and incur finance charges, you are paying back much more than your initial loan.

#### Start Saving

If you start saving early, the same miracle of compound interest that locks you into years of credit card debt can work to your benefit (for an online compound interest calculator, visit <http://www.interestcalc.org>). Experts recommend “paying yourself first” every month—that is, putting some money into savings before you pay your bills. You may want to save for a large purchase, or you may even be looking ahead to retirement. If you work for a company with a 401(k) retirement plan, contribute as much as you can every pay period.

#### Become Financially Literate

Most Americans have not received any basic financial training. For this reason, the U.S. government has established the Financial Literacy and Education Commission ([MyMoney.gov](http://MyMoney.gov)) to help Americans learn how to save, invest, and manage money better. Developing lifelong financial skills should begin in early adulthood, during the college years, if not earlier, as money-management experience appears to have a more direct effect on financial knowledge than does education. For example, when tested on their basic financial literacy, students who had checking accounts had higher scores than those who did not.

**SOURCES:** Smith, C., and G. A. Barboza. 2013. The role of transgenerational financial knowledge and self-reported financial literacy on borrowing practices and debt accumulation of college students. *Social Science Research Network* (<http://ssrn.com/abstract=2342168>); Board of Governors of the Federal Reserve System. 2018. *Report on the Economic Well-Being of U.S. Households in 2017–May 2018* (<https://www.federalreserve.gov/publications/2018-economic-well-being-of-us-households-in-2017-preface.htm>); EverFi. 2016. *Money Matters on Campus: Examining Financial Attitudes and Behaviors of Two-Year and Four-Year College Students* ([www.moneymattersoncampus.org](http://www.moneymattersoncampus.org)).

# TAKE CHARGE

## Life Expectancy and the Obesity Epidemic



Life expectancy consistently increased each decade in the United States since 1900 (see Figure 1.2). But the upward trend has reversed, and some researchers point to the significant increase in obesity among Americans as a potential cause. According to estimates released in 2018, about 34% of adults and 19% of children are obese. The problem isn't confined to the United States: The 2018 European Congress on Obesity estimates that by 2045, 22% of the global population will be obese.

Along with increases in obesity come increased rates of diabetes, chronic liver disease, heart disease, stroke, and other chronic diseases that are leading causes of death. Of course, medical interventions for these conditions have improved over time, lessening the impact of obesity to date. Still, medical treatments may be reaching their limits in preventing early deaths related to obesity. Moreover, people are becoming obese at earlier ages, exposing them to the adverse effects of excess body fat over a longer period of time. The magnitude of the obesity problem has brought predictions that an overall decline in life expectancy will take place in the United States by the mid-21st century.

What can be done? For an individual, body composition is influenced by a complex interplay of personal factors, including heredity, metabolic rate, hormones, age, and dietary and activity habits. But many outside forces—social, cultural, and economic—shape our behavior, and some experts recommend viewing obesity as a public health problem that requires an urgent and coordinated public health response. A response in health care technology such as gastric bypass surgery, medications, and early screening for obesity-related diseases has helped in the past, but if obesity trends persist, especially among children, average life spans may begin to decrease.

What actions might be taken? Suggestions from health promotion advocates include the following:

- Change food pricing to promote healthful options; for example, tax sugary beverages and offer incentives to farmers and food manufacturers to produce and market affordable healthy choices and smaller portion sizes.
- Limit advertising of unhealthy foods targeting children.
- Require daily physical education classes in schools.
- Fund strategies to promote physical activity by creating more walkable communities, parks, and recreational facilities.

- Train health professionals to provide nutrition and exercise counseling, and mandate health insurance coverage for treatment of obesity as a chronic condition.

- Promote the expansion of work site programs for improving diet and physical activity habits.
- Encourage increased public investment in obesity-related research.

In addition to indirectly supporting these actions, you can directly do the following:

- Analyze your own food choices, and make appropriate changes. Nutrition is discussed in detail in Chapter 10, but you can start by shifting away from consuming foods high in sugar and refined grains.
- Be more physically active. Take the stairs rather than the elevator, ride a bike instead of driving a car, and reduce your overall sedentary time.
- Educate yourself about current recommendations and areas of debate in nutrition.
- Speak out, vote, and become an advocate for healthy changes in your community.

See Chapters 10–12 for more on nutrition, exercise, and weight management.

**SOURCES:** Hales, C. M., et al. 2018. Trends in obesity and severe obesity prevalence in U.S. youth and adults by sex and age, 2007–2008 to 2015–2016. *JAMA* 319(16): 1723–1725; Ludwig, D. S. 2016. Lifespan weighed down by diet. *JAMA* (published online April 4, 2016, DOI: 10.1001/jama.2016.3829); Olshansky, S. J., et al. 2005. A potential decline in life expectancy in the United States in the 21st century. *New England Journal of Medicine* 352(11): 1138–1145; National Center for Health Statistics. 2016. *Health, United States, 2015: With Special Feature on Racial and Ethnic Health Disparities*. Hyattsville, MD: National Center for Health Statistics; International Food Policy Research Institute. 2016. *Global Nutrition Report 2016: From Promise to Impact: Ending Malnutrition by 2030*. Washington, DC: International Food Policy Research Institute; U.S. Department of Agriculture. 2015. *Scientific Report of the 2015 Dietary Guidelines Advisory Committee* (<http://www.health.gov/dietaryguidelines/2015-scientific-report>); Fottrell, Q. 2018. Almost a quarter of the world's population will be obese by 2045. MarketWatch.com, May 26.

In the early 20th century, **morbidity** and **mortality rates** (rates of illness and death, respectively) from common **infectious diseases** (e.g., pneumonia, tuberculosis, and diarrhea) were much higher than Americans experience today. By 1980, life expectancy had nearly doubled, due largely to the development of vaccines and antibiotics to fight infections and to public health measures such as water purification and sewage treatment to improve

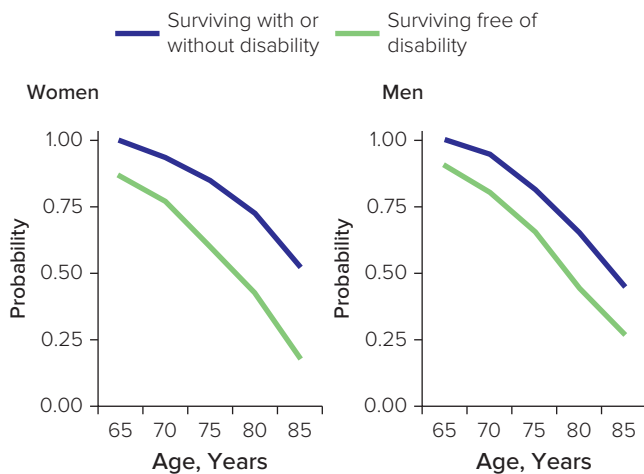
**morbidity rate** The relative incidence of disease among a population.

### TERMS

**mortality rate** The number of deaths in a population in a given period; usually expressed as a ratio, such as 75 deaths per 1000 members of the population.

**infectious disease** A disease that can spread from person to person, caused by microorganisms such as bacteria and viruses.





**FIGURE 1.3 Quantity of life versus quality of life.** Probability of surviving overall and surviving without disability, United States, 2011. People living to older ages are likelier to do so with some health problems.

**SOURCE:** Adapted from Freedman, V. A., D. A. Wolf, and B. C. Spillman. 2016. Disability-free life expectancy over 30 years: A growing female disadvantage in the US population. *American Journal of Public Health* 106(6): 1079–1085.

living conditions. The major difference between life span (how long we live) and **health span** (how long we stay healthy) is freedom from chronic or disabling disease (Figure 1.3).

The good news is that people have some control over whether they develop **chronic diseases**. For example, each of us can take personal responsibility for **lifestyle choices** about smoking, diet, exercise, and drug and alcohol use. Tables 1.1 and 1.2 show the estimated number of annual deaths tied to selected underlying causes. The need to make

## Ask Yourself

### QUESTIONS FOR CRITICAL THINKING AND REFLECTION

How often do you feel exuberant? Vital? Joyful? What makes you feel that way? Conversely, how often do you feel downhearted, de-energized, or depressed? What makes you feel that way? Have you ever thought about how you might increase experiences of vitality and decrease experiences of discouragement?

**health span** How long we stay healthy and free from chronic or disabling disease.

**chronic disease** A disease that develops and continues over a long period, such as heart disease, cancer, or diabetes.

**lifestyle choice** A conscious behavior that can increase or decrease a person's risk of disease or injury; such behaviors include smoking, exercising, and eating a healthful diet.

**health promotion** The process of enabling people to increase control over their health and its determinants, and thereby improve their health.

### TERMS

good choices is especially true for teens and young adults. For Americans aged 15–24, for example, the leading cause of death is unintentional injuries (accidents), with the greatest number of deaths linked to car crashes (Table 1.3).

## PROMOTING NATIONAL HEALTH

Wellness is a personal concern, but the U.S. government has financial and humanitarian interests in it, too. A healthy population is the nation's source of vitality, creativity, and wealth. Poor health drains the nation's resources and raises health care costs for all. The primary **health promotion** strategies at the government and community levels are public health policies and agencies that identify and discourage unhealthy and high-risk behaviors and that encourage and provide incentives for positive health behaviors. At the federal level in the United States, the National Institutes of Health (NIH) and the Centers for Disease Control and Prevention (CDC) are charged with promoting the public's health. These and other agencies translate research results into interventions and communicate research findings to health care providers and the public. There are also health promotion agencies and programs at the state, community, workplace, and college levels. Take advantage of health promotion resources at all levels that are available to you.

## Health Insurance Options

The Affordable Care Act (ACA), also called “Obamacare,” was signed into law on March 23, 2010. It has remained in effect under President Trump, but certain provisions have been altered. Health insurance costs will likely increase as a result.

**Finding a Plan** Under the ACA, health insurance marketplaces, also called health exchanges, facilitate the purchase of health insurance at the state level. The health exchanges provide a selection of government-regulated health care plans that students and others may choose from. Those who are below income requirements are eligible for federal help with the premiums. Many employers and universities also offer health insurance to their employees and students. Small businesses and members of certain associations may also be able to purchase insurance through membership in a professional group.

**Benefits to College Students** The ACA continues to permit students to stay on their parents' health insurance plans until age 26—even if they are married or have access to coverage through an employer. Students not on their parents' plans who do not want to purchase insurance through their schools can do so through a health insurance marketplace.

Young, healthy people may prefer to buy a “catastrophic” health plan. Such plans tend to have low premiums but



**Table 1.1** Leading Causes of Death in the United States, 2016

RANK	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENTAGE OF TOTAL DEATHS	LIFESTYLE FACTORS
1	Heart disease	635,260	23.1	D I S A O
2	Malignant neoplasms (cancer)	598,038	21.8	D I S A O
3	Unintentional injuries (accidents)	161,374	5.9	I S A
4	Chronic lower respiratory diseases	154,596	5.6	I S A
5	Cerebrovascular diseases (stroke)	142,142	5.2	D I S A O
6	Alzheimer's disease	116,103	4.2	I S A
7	Diabetes mellitus	80,058	2.9	D I S A O
8	Influenza and pneumonia	51,537	1.9	D I S A
9	Kidney disease	50,046	1.8	I S A
10	Intentional self-harm (suicide)	44,965	1.6	I S A
11	Septicemia (systemic blood infection)	40,613	1.5	I S A
12	Chronic liver disease and cirrhosis	40,545	1.5	I S A
13	Hypertension (high blood pressure)	33,246	1.2	D I S A O
14	Parkinson's disease	29,697	1.1	I S A
15	Lung inflammation due to solids and liquids	19,715	0.7	I S A
	All other causes	547,286		I S A
	All causes	2,744,248	100.0	I S A

**Key**

D	Diet plays a part.	S	Smoking plays a part.
I	Inactive lifestyle plays a part.	A	Excessive alcohol use plays a part.
O	Obesity is a contributing factor.		

**SOURCE:** Centers for Disease Control and Prevention. 2017. *Fatal Injury Data: Leading Causes of Death 1981–2016* (<https://www.cdc.gov/injury/wisqars/index.html>).

**Table 1.2** Key Contributors to Deaths among Americans

	ESTIMATED NUMBER OF DEATHS PER YEAR	PERCENTAGE OF TOTAL DEATHS PER YEAR
Diet/activity patterns (obesity)*	500,000	19.0
Tobacco	480,000	17.8
Microbial agents**	140,000	5.0
Alcohol consumption	90,000	3.5
Illicit drug use***	55,000	2.0
Firearms	35,000	1.3
Motor vehicles	35,000	1.3
Sexual behavior****	15,000	0.5

\*The number of deaths due to obesity is an area of ongoing controversy and research. Recent estimates have ranged from 112,000 to 400,000.

\*\*Microbial agents include bacterial and viral infections, such as influenza, pneumonia, and hepatitis. Infections transmitted sexually are counted in the "sexual behavior" category, including a proportion of deaths related to hepatitis, which can be transmitted both sexually and nonsexually.

\*\*\*Drug overdose deaths have increased rapidly in recent years, making it likely that this estimate will rise.

\*\*\*\*Estimated deaths linked to sexual behavior includes deaths from cervical cancer and sexually acquired HIV, hepatitis B, and hepatitis C.

**SOURCES:** Murphy, S. L., et al. 2017. Deaths: Final data for 2015. *National Vital Statistics Reports* (66)6; The U.S. Burden of Disease Collaborators. 2018. The state of U.S. health, 1990–2016: Burden of diseases, injuries, and risk factors among US states. *Journal of the American Medical Association* 319(14); Contribution of excessive alcohol consumption to deaths and years of potential life lost in the United States. *Preventing Chronic Disease: Research, Practice, and Policy* 11: 130293; U.S. Department of Health and Human Services. 2014. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.

**Table 1.3** Leading Causes of Death among Americans Aged 15–24, 2015

RANK	CAUSE OF DEATH	NUMBER OF DEATHS	PERCENTAGE OF TOTAL DEATHS
1	Unintentional injuries (accidents):	12,514	41.0
	Motor vehicle	6,977	22.8
	All other unintentional injuries	5,537	18.2
2	Suicide	5,491	18.0
3	Homicide	4,733	15.5
4	Cancer	1,469	4.8
5	Heart disease	1,226	4.0
	All causes	30,494	100.0

**SOURCE:** Murphy, S. L., et al. 2017. Deaths: Final data for 2015. *National Vital Statistics Reports* 66(6).

**Table 1.4** Progress toward *Healthy People 2020* Targets

	BASELINE (% IN 2008)	MOST RECENT (% IN 2016)	TARGET (% BY 2020)	PROGRESS TOWARD GOAL
Increase proportion of people with health insurance	83.2	89.7	100.0	Significant progress
Reduce proportion of adults with hypertension	29.9	29.5	26.9	Insignificant progress
Reduce proportion of obese adults	33.9	38.6	30.5	Getting worse
Reduce proportion of adults who drank excessively in past 30 days	28.2	28.2	25.4	No progress
Increase proportion of adults who meet federal guidelines for exercise	18.2	22.5	20.1	Target met
Reduce proportion of adults who use cigarettes	20.6	15.7	12.0	Significant progress

**SOURCE:** U.S. Department of Health and Human Services. *Healthy People 2020* data search (<https://www.healthypeople.gov/2020/data-search/Search-the-Data>).

require you to pay all medical costs up to a certain amount, usually several thousand dollars. This can be risky if you select a plan that does not cover the ACA's 10 essential benefits. They are: preventive care, outpatient care, emergency services, hospitalization, maternity care, lab tests, mental health and substance use treatment, prescription drugs, rehabilitative services and devices, lab services, and pediatric care. It's recommended that everyone select a plan that covers all of these important types of care.

Students whose income is below a certain level may qualify for Medicaid. Check with your state. Individuals with non-immigrant status, which includes worker visas and student visas, qualify for insurance coverage through the exchanges. You can browse plans and apply for coverage at HealthCare.gov.

## The Healthy People Initiative

The national Healthy People initiative aims to prevent disease and improve Americans' quality of life. *Healthy People* reports, published each decade since 1980, set national health goals based on 10-year agendas. *Healthy People 2030* is in development and proposes the eventual achievement of the following broad national health objectives:

- Eliminate preventable disease, disability, injury, and premature death.
- Achieve health equity, eliminate disparities, and improve health literacy.
- Create social, economic, and physical environments that promote good health for all.
- Promote healthy development and healthy behaviors across every stage of life.
- It has remained in effect under President Trump, but certain provisions have been altered. Health insurance costs will likely increase as a result.

This continues a trend set by *Healthy People 2020*, which emphasizes the importance of health determinants—factors that affect the health of individuals, demographic groups, or entire populations. Health determinants are social (including factors such as ethnicity, education level, or economic status) and environmental (including natural and human-made environments). Thus one goal is to improve living conditions in ways that reduce the impact of negative health determinants.

Examples of individual health-promotion goals from *Healthy People 2020*, along with estimated progress, appear in Table 1.4.

## Health Issues for Diverse Populations

We all need to exercise, eat well, manage stress, and cultivate positive relationships. We also need to protect ourselves from disease and injuries. But some of our differences—both as individuals and as members of groups—have important implications for wellness. These differences can be biological (determined genetically) or cultural (acquired as patterns of behavior through daily interactions with family, community, and society); many health conditions are a function of biology and culture combined.

Eliminating health disparities is a major focus of *Healthy People*. But not all health differences between groups are considered **health disparities**, which are those differences linked with social, economic, and/or environmental disadvantage. They affect groups who have systematically experienced greater obstacles to health based on characteristics that are historically linked to exclusion or discrimination. For example, the fact that women have a higher rate of breast cancer than men is a health *difference* but is not considered a disparity. In contrast, the higher death rates from breast cancer for black women compared with non-Hispanic white women is considered a health disparity.

You share patterns of influences with certain others, and information about those groups can help you identify areas that may be of concern to you and your family.

**Sex and Gender** *Sex* refers to the biological and physiological characteristics that define men, women, and intersex people. In contrast, *gender* encompasses how people identify themselves and also the roles, behaviors, activities, and attributes that a given society considers appropriate for them. Examples of gender-related characteristics that affect wellness include the higher rates of smoking and drinking found among men and the lower earnings found among women (compared with men doing similar work). Although men are more biologically likely than women to suffer from certain diseases (a sex issue), men are less likely to visit their physicians for regular exams (a gender issue). Men have higher rates of death from injuries, suicide, and homicide, whereas women are at greater risk for Alzheimer's disease and depression. On average, men and women also differ in body composition and certain aspects of physical performance.

**Race and Ethnicity** Among America's racial and ethnic groups, striking disparities exist in health status, access to and quality of health care, and life expectancy. However, measuring the relationships between ethnic or racial backgrounds and health issues is complicated for several reasons. First, separating the effects of race and ethnicity from socioeconomic status is difficult. In some studies, controlling for social conditions reduces health disparities. For example, a study from the Exploring Health Disparities in Integrated Communities project found that in a racially integrated community where blacks and whites had the same earnings, disparities were eliminated or reduced in the areas of hypertension, female obesity, and diabetes.

In other studies, even when patients shared equal status in terms of education and income, insurance coverage, and clinical need, disparities in care persisted. For example, compared with non-Hispanic whites, blacks and Hispanics are less likely to get appropriate medication for heart conditions or to have coronary artery bypass surgery; they are also less likely to receive kidney transplants or dialysis.

Second, the classification of race (a social construct) itself is complex. How are participants in medical studies classified? Sometimes participants choose their own identities; sometimes the physician/researcher assigns identities; sometimes both parties are involved in the classification; and sometimes participants and researchers may disagree.

Despite these limitations, it is still useful to identify and track health risks among population groups. Some diseases are concentrated in certain gene pools, the result of each ethnic group's relatively distinct history. Sickle-cell disease, for example, is most common among people of African ancestry. Tay-Sachs disease tends to afflict people of Eastern European Jewish heritage and French Canadian heritage. Cystic fibrosis is more common among Northern Europeans.

In addition to biological differences, many cultural differences occur along ethnic lines. Ethnic groups vary in their traditional diets; the fabric of their family and interpersonal relationships; their attitudes toward tobacco, alcohol, and other drugs; and their health beliefs and practices. All these factors have implications for wellness.

In tracking health status, the federal government collects data on what it defines as five race groups (African American/black, American Indian or Alaska Native, Asian American, Native Hawaiian or Other Pacific Islander, and white) as well as two categories of ethnicity (Hispanic or Latino; not Hispanic or Latino); Hispanics may identify as being of any race group.

- **African Americans** have the same leading causes of death as the general population, but they have a higher infant mortality rate and lower rates of suicide and osteoporosis. Health issues of special concern for African Americans include high blood pressure, stroke, diabetes, asthma, and obesity. African American men are at significantly higher risk of prostate cancer than men in other groups.

- **American Indians and Alaska Natives** typically embrace a tribal identity, such as Sioux, Navaho, or Hopi. American Indians and Alaska Natives have lower death rates from heart disease, stroke, and cancer than the general population, but they have higher rates of early death from causes linked to smoking and alcohol use, including injuries and cirrhosis. Diabetes is a special concern for many groups.

- **Asian Americans** include people who trace their ancestry to countries in the Far East, Southeast Asia, or the Indian

**health disparity** A health difference linked to social, economic, or environmental disadvantage that adversely affects a group of people.

**TERMS**



## DIVERSITY MATTERS

### Moving toward Health Equity

In 2016, the National Center for Health Statistics released a special review of progress on racial and ethnic health disparities over a 15-year period. Although disparities persist, the gaps have shrunk in many key measures of health conditions, health behaviors, and access to and use of health care. Examples include the following:

- The life expectancy gap between whites and blacks dropped from 5.9 years to 3.4 years.
- The percentage of adults without health insurance declined among all groups following the passage of the

Affordable Care Act, with the greatest improvement seen among Latinos.

- Infant mortality rates dropped among all groups; the largest declines were for the two groups with the highest rates—African Americans and American Indians or Alaska Natives.

One key goal for collecting data by demographic characteristics is to better identify the population groups at risk and to target those groups with tailored strategies specifically designed to reduce health disparities. A 2016 report from the CDC highlighted a variety of successful interventions (see table).

Public health professionals hope to identify and implement more such programs that promote health equity and help ensure that all Americans live long and healthy lives. You can help by supporting health promotion programs in your community.

**SOURCES:** National Center for Health Statistics. 2016. *Health, United States, 2015: With Special Feature on Racial and Ethnic Health Disparities*. Hyattsville, MD: National Center for Health Statistics; Centers for Disease Control and Prevention. 2016. *Selected CDC-Sponsored Interventions, United States, 2016* (<http://www.cdc.gov/minorityhealth/strategies2016/index.html>).

TARGETED POPULATION	INTERVENTION AND RESULTS
Black and Hispanic children	Case management and home visits by community health workers <b>decreased asthma-related hospitalizations.</b>
Nonwhite racial/ethnic groups	Expanded vaccination recommendations <b>eliminated some disparities in hepatitis A disease.</b>
People living with disabilities	Curriculum for living well with a disability <b>improved quality of life.</b>
Men who have sex with men	Personalized counseling <b>reduced HIV risk behaviors.</b>
American Indian and Alaska Native populations	Tribally driven efforts to reclaim traditional food systems <b>facilitated dialogue about health.</b>
Low-income populations and Alaska Natives	Client and provider reminders and patient navigators <b>increased colorectal cancer screening rates.</b>
Youth in high-risk communities	Programs and policies supporting better neighborhood conditions <b>reduced violence.</b>
Hispanic and Latino immigrant men	Lay health advisers <b>reduced HIV risk behaviors.</b>

subcontinent. Asian Americans have lower rates of coronary heart disease and obesity. However, health differences exist among these groups. For example, Southeast Asian American men have higher rates of smoking and lung cancer, and Vietnamese American women have higher rates of cervical cancer.

- **Native Hawaiian and Other Pacific Islander Americans** trace their ancestry to the original peoples of Hawaii, Guam, Samoa, and other Pacific Islands. Pacific Islander Americans have a higher overall death rate than the general population and higher rates of diabetes and asthma. Smoking and obesity are special concerns for this group.

- **Latinos** are a diverse group, with roots in Mexico, Puerto Rico, Cuba, and South and Central America. Many Latinos are of mixed Spanish and American Indian descent or of mixed Spanish, Indian, and African American descent. Latinos on average have lower rates of heart disease, cancer, and suicide than the general population; areas of concern

include gallbladder disease, obesity, diabetes, and lack of health insurance.

Poverty and low educational attainment are key factors underlying ethnic health disparities, but they do not fully account for the differences. Access to appropriate health care can be a challenge. Nonwhite racial and ethnic groups, regardless of income, may live in areas that are medically underserved, with fewer sources of high-quality or specialist care. Language and cultural barriers, along with racism and discrimination, can also prevent people from receiving appropriate health services. However, progress is being made; see the box “Moving toward Health Equity.”

**Income and Education** Income and education are closely related. Groups with the highest poverty rates and the least education have the worst health status. They have higher rates of infant mortality, traumatic injury, violent death, and many diseases, including heart disease, diabetes, tuberculosis,



HIV infection, and some cancers. They are also more likely to eat poorly, be overweight, smoke, drink, and use drugs. And to complicate and magnify all these factors, they are also exposed to more day-to-day stressors and have less access to health care services. Researchers estimate that about 250,000 deaths per year can be attributed to low educational attainment, 175,000 to individual and community poverty, and 120,000 to income inequality.

**Disability** People with disabilities have activity limitations or need assistance due to a physical or mental impairment. About one in five people in the United States has some level of disability, and the rate is rising, especially among younger segments of the population. People with disabilities are more likely to be inactive and overweight. They report more days of depression than people without disabilities. Many also lack access to health care services.

**Geographic Location** About one in four Americans currently lives in a rural area—a place with fewer than 10,000 residents. People living in rural areas are less likely to be physically active, use seat belts, or obtain screening tests for preventive health care. They have less access to timely emergency services and much higher rates of some diseases and injury-related deaths than people living in urban areas. They are also more likely to lack health insurance. Children living in dangerous neighborhoods—rural or urban—are less likely to play outside and are four times more likely to be overweight than children living in safer areas.

**Sexual Orientation and Gender Identity** Lesbian, gay, bisexual, and transgender (LGBT) health was added as a new topic area in *Healthy People 2020*. Questions about sexual orientation and gender identity have not been included in many health surveys, making it difficult to estimate the number of LGBT people and to identify their special health needs. However, research suggests that LGBT individuals may face health disparities due to discrimination and denial of their civil and human rights. LGBT youth have high rates of tobacco, alcohol, and other drug use as well as an elevated risk of suicide; they are more likely to be homeless and are less likely to have health insurance and access to appropriate health care providers and services.

## FACTORS THAT INFLUENCE WELLNESS

Optimal health and wellness come mostly from a healthy lifestyle—patterns of behavior that promote and support your health and promote wellness now and as you get older. In the pages that follow, you'll find current information and suggestions you can use to build a healthier lifestyle; also, see the "Wellness Matters for College Students" box.

Our behavior, family health history, environment, and access to health care are all important influences on wellness. These factors, which vary for both individuals and groups, can interact in ways that produce either health or disease.

## Health Habits

Research continually reveals new connections between our habits and health. For example, heart disease is associated with smoking, stress, a hostile attitude, a poor diet, and being sedentary. Poor health habits take hold before many Americans reach adulthood.

Other habits, however, are beneficial. Regular exercise can help prevent heart disease, high blood pressure, diabetes, osteoporosis, and depression. Exercise can also reduce the risk of colon cancer, stroke, and back injury. A balanced and varied diet helps prevent many chronic diseases. As we learn more about how our actions affect our bodies and minds, we can make informed choices for a healthier life.

## Heredity/Family History

Your **genome** consists of the complete set of genetic material in your cells—about 25,000 genes, half from each of your parents. **Genes** control the production of proteins that serve both as the structural material for your body and as the regulators of all your body's chemical reactions and metabolic processes. The human genome varies only slightly from person to person, and many of these differences do not affect health. However, some differences have important implications for health, and knowing your family's health history can help you determine which conditions may be of special concern for you.

Errors in our genes are responsible for about 3500 clearly hereditary conditions, including sickle-cell disease and cystic fibrosis. Altered genes also play a part in heart disease, cancer, stroke, diabetes, and many other common conditions. However, in these more common and complex disorders, genetic alterations serve only to increase an individual's risk, and the disease itself results from the interaction of many genes with other factors. An example of the power of behavior and environment can be seen in the more than 60% increase in the incidence of diabetes that has occurred among Americans since 1990. This huge increase is not due to any sudden change in our genes; it is the result of increasing rates of obesity caused by poor dietary choices and lack of physical activity.

### QUICK

### STATS

**More than  
29 million  
American adults  
have diabetes, and  
25% of them don't  
know it.**

—Centers for Disease  
Control and Prevention, 2018

**genome** The complete set of genetic material in an individual's cells.

### TERMS

**gene** The basic unit of heredity, containing chemical instructions for producing a specific protein.





## WELLNESS ON CAMPUS

### Wellness Matters for College Students

Most college students, in their late teens and early twenties, appear to be healthy. But appearances can be deceiving. Each year, thousands of students lose productive academic time to physical and emotional health problems—some of which can continue to plague them for life.

The following table shows the top 10 health issues affecting students' academic performance, according to the fall 2015 American College Health Association–National College Health Assessment II.

HEALTH ISSUE	STUDENTS AFFECTED (%)
Stress	30.3
Anxiety	23.7
Sleep difficulties	20.4
Depression	14.6
Cold/flu/sore throat	13.5
Concern for a friend/family member	10.0
Relationship difficulties	8.6
Attention deficit/hyperactivity disorder	6.0
Death of a friend/family member	5.5
Sinus or ear infection, strep throat, bronchitis	4.7

Each of these issues is related to one or more of the dimensions of wellness, and most can be influenced by choices students make daily. Although some troubles—such as the death of a friend or family member—cannot be controlled, students can moderate their physical and emotional impact by choosing healthy behaviors. For example, there are many ways to manage stress, the top health issue affecting students (see Chapter 2). By reducing unhealthy choices (such as using alcohol to relax) and by increasing healthy choices (such as using time management and relaxation techniques), students can reduce the impact of stress on their lives.

The survey also estimated that, based on students' reporting of their height and weight, nearly 23.3% of college students are overweight and 16.3% are obese. Although heredity

plays a role in determining your weight, lifestyle is also a factor in weight management.

In many studies over the past few decades, a large percentage of students have reported behaviors such as the following:

- Overeating
- Frequently eating high-fat foods
- Using alcohol and binge drinking

Clearly, eating behaviors are often a matter of choice. Although students may not see (or feel) the effects of their dietary habits today, the long-term health risks are significant. Overweight and obese persons run a higher-than-normal risk of developing diabetes, heart disease, and cancer later in life. We now know with certainty that improving one's eating habits, even a little, can lead to weight loss and improved overall health.

### Other Choices, Other Problems

Students commonly make other unhealthy choices. Here are some examples from the 2015 National College Health Assessment II:

- Only 47.8% of students reported that they used a condom during vaginal intercourse in the past 30 days.
- About 18.7% of students had seven or more drinks the last time they partied.
- About 9.6% of students had smoked cigarettes at least once during the past month.

What choices do you make in these situations? Remember: It's never too late to change. The sooner you trade an unhealthy behavior for a healthy one, the longer you'll be around to enjoy the benefits.

**SOURCE:** American College Health Association. 2015. *American College Health Association–National College Health Assessment IIc: Reference Group Executive Summary Fall 2015*. Hanover, MD: American College Health Association. Reprinted by permission of the American College Health Association ([http://www.acha-ncha.org/reports\\_ACHA-NCHAIIc.html](http://www.acha-ncha.org/reports_ACHA-NCHAIIc.html)).

## Environment

Your environment includes substances and conditions in your home, workplace, and community. Are you frequently exposed to environmental tobacco smoke or the radiation in sunlight? Do you live in an area with high rates of crime and violence? Do you have access to nature?

Today environmental influences on wellness also include conditions in other countries and around the globe, particularly weather and climate changes occurring as a result of global warming. The burning of fossil fuels causes not only climate change but also outdoor air pollution, which damages

the heart and lungs. Indoor air pollution caused by toxic gases (e.g., carbon monoxide and radon), household cleaning products, formaldehyde, and mold can also lead to serious health problems for people who are exposed. Industrial waste, including lead and cancer-causing chemicals, can leach into our water and compromise our health.

## Access to Health Care

Adequate health care helps improve both quality and quantity of life through preventive care and the treatment of disease. For example, vaccinations prevent many

dangerous infections, and screening tests help identify key risk factors and diseases in their early treatable stages. As described earlier, inadequate access to health care is tied to factors such as low income, lack of health insurance, and geographic location. Cost is one of many issues surrounding the development of advanced health-related technologies.

## Personal Health Behaviors

In many cases, behavior can tip the balance toward good health, even when heredity or environment is a negative factor. For example, breast cancer can run in families, but it also may be associated with being overweight and inactive. A woman with a family history of breast cancer is less likely to develop the disease if she controls her weight, exercises regularly, and has regular mammograms to help detect the disease in its early, most treatable stage.

Similarly, a young man with a family history of obesity can maintain a normal weight by balancing calorie intake against activities that burn calories. If your life is highly stressful, you can lessen the chances of heart disease and stroke by managing and coping with stress (see Chapter 2). If you live in an area with severe air pollution, you can reduce the risk of lung disease by not smoking. You can also take an active role in improving your environment. Behaviors like these can make a difference in how great an impact heredity and environment will have on your health.

## REACHING WELLNESS THROUGH LIFESTYLE MANAGEMENT

As you consider the behaviors that contribute to wellness, you may be doing a mental comparison with your own behaviors. If you are like most young adults, you probably have some healthy habits and some habits that place your health at risk. For example, you may be physically active and have a healthful diet but spend excessive hours playing video games. You may be careful to wear your seat belt in your car but skip meals. Moving in the direction of wellness means cultivating healthy behaviors and working to overcome unhealthy ones. This approach to lifestyle management is called **behavior change**.

As you may already know, changing an unhealthy habit (such as giving up cigarettes) can be harder than it sounds. When you embark on a behavior change plan, it may seem like too much work at first. But as you make progress, you will gain confidence in your ability to take charge of your life. You will also experience the benefits of wellness—more energy, greater vitality, deeper feelings of appreciation and curiosity, and a higher quality of life.

## Getting Serious about Your Health

Before you can start changing a wellness-related behavior, you have to know that the behavior is problematic and that you *can* change it. To make good decisions, you need information about relevant topics and issues, including what resources are available to help you change.

**Examine Your Current Health Habits** How is your current lifestyle affecting your health today and in the future? Think about which of your current habits enhance your health and which detract from it. Begin your journey toward wellness with self-assessment: Talk with friends and family members about what they have noticed about your lifestyle and your health, and take the quiz in the box titled “Wellness: Evaluate Your Lifestyle.” Challenge any unrealistically optimistic attitudes or ideas you may hold—for example, “To protect my health, I don’t need to worry about quitting smoking until I’m 40 years old” or “Being overweight won’t put *me* at risk for diabetes.” Health risks are very real and can become significant while you’re young; health habits are important throughout life.

Many people consider changing a behavior when friends or family members express concern, when a landmark event occurs (such as turning 30), or when new information raises their awareness of risk. If you find yourself reevaluating some of your behaviors as you read this text, take advantage of the opportunity to make a change in a structured way.

**Choose a Target Behavior** Changing any behavior can be demanding. Start small by choosing one behavior you want to change—called a **target behavior**—and working on it until you succeed. Your chances of success will be greater if your first goal is simple, such as resisting the urge to snack between classes. As you change one behavior, make your next goal a little more significant, and build on your success.

**Learn about Your Target Behavior** Once you’ve chosen a target behavior, you need to learn its risks and benefits—both now and in the future. Ask these questions:

- How is your target behavior affecting your level of wellness today?
- Which diseases or conditions does this behavior place you at risk for?
- What effect would changing your behavior have on your health?

QUICK

STATS

Only **27.7%**  
of American adults  
are at a healthy  
weight.

—National Center for  
Health Statistics, 2016

**behavior change** A lifestyle management process that involves cultivating healthy behaviors and working to overcome unhealthy ones.

**target behavior** An isolated behavior selected as the object for a behavior change program.

TERMS



## CRITICAL CONSUMER

### Evaluating Sources of Health Information

Surveys indicate that college students are smart about evaluating health information. They trust the health information they receive from health professionals and educators and are skeptical about popular information sources, such as magazine articles and websites.

How good are you at evaluating health information? Here are some tips.

#### General Strategies

Whenever you encounter health-related information, take the following steps to make sure it is credible:

- **Go to the original source.** Media reports often simplify the results of medical research. Find out for yourself what a study really reported, and determine whether it was based on good science. What type of study was it? Was it published in a recognized medical journal? Was it an animal study, or did it involve people? Did the study include a large number of people? What did the authors of the study actually report?
- **Watch for misleading language.** Reports that tout “breakthroughs” or “dramatic proof” are probably hype. A study may state that a behavior “contributes to” or is “associated with” an outcome; this does not prove a cause-and-effect relationship.
- **Distinguish between research reports and public health advice.** Do not change your behavior based on the results of a single report or study. If an agency such as the National Cancer Institute urges a behavior change, however, follow its advice. Large, publicly funded organizations issue such advice based on many studies, not a single report.
- **Remember that anecdotes are not facts.** A friend may tell you he lost weight on some new diet, but individual success stories do not mean the plan is truly safe or effective. Check with your doctor before making any serious lifestyle changes.
- **Be skeptical.** If a report seems too good to be true, it probably is. Be wary of information contained in advertisements.

An ad’s goal is to sell a product, even if there is no need for it.

- **Make choices that are right for you.** Friends and family members can be a great source of ideas and inspiration, but you need to make health-related choices that work best for you.

#### Internet Resources

Online sources pose special challenges; when reviewing a health-related website, ask these questions:

- **What is the source of the information?** Websites maintained by government agencies, professional associations, or established academic or medical institutions are likely to present trustworthy information. Many other groups and individuals post accurate information, but it is important to look at the qualifications of the people who are behind the site. (Check the home page or click the “About Us” link.)
- **How often is the site updated?** Look for sites that are updated frequently. Check the “last modified” date of any web page.
- **Is the site promotional?** Be wary of information from sites that sell specific products, use testimonials as evidence, appear to have a social or political agenda, or ask for money.
- **What do other sources say about a topic?** Be cautious of claims or information that appear at only one site or come from a chat room, bulletin board, newsgroup, or blog.
- **Does the site conform to any set of guidelines or criteria for quality and accuracy?** Look for sites that identify themselves as conforming to some code or set of principles, such as those established by the Health on the Net Foundation or the American Medical Association. These codes include criteria such as use of information from respected sources and disclosure of the site’s sponsors.

As a starting point, use this text and the resources listed in the For More Information section at the end of each chapter. See the “Evaluating Sources of Health Information” box for additional guidelines.

**Find Help** Have you identified a particularly challenging target behavior or condition—something like overuse of alcohol, binge eating, or depression—that interferes with your ability to function or places you at a serious health risk? If so, you may need help to change a behavior or address a disorder that is deeply rooted or too serious for self-management. Don’t let the problem’s seriousness stop you; many resources are available to help you solve it. On campus, the student

health center or campus counseling center can provide assistance. To locate community resources, consult the yellow pages, your physician, or the internet.

### Building Motivation to Change

Knowledge is necessary for behavior change, but it isn’t usually enough to make people act. Millions of people have sedentary lifestyles, for example, even though they know it’s bad for their health. This is particularly true of young adults, who feel healthy despite their unhealthy behaviors. To succeed at behavior change, you need strong motivation. The sections that follow address some considerations.

**Examine the Pros and Cons of Change** Health behaviors have short-term and long-term benefits and costs. Consider the benefits and costs of an inactive lifestyle:

- **Short-term.** Such a lifestyle allows you more time to watch TV, use social media, do your homework, and hang out with friends, but it leaves you less physically fit and less able to participate in recreational activities.
- **Long-term.** It increases the risk of heart disease, cancer, stroke, and premature death.

To successfully change your behavior, you must believe that the benefits of change outweigh the costs.

Carefully examine the pros and cons of continuing your current behavior and of changing to a healthier one. Focus on the effects that are most meaningful to you, including those that are tied to your personal identity and values. For example, engaging in regular physical activity and getting adequate sleep can support an image of yourself as an active person who is a good role model for others. To complete your analysis, ask friends and family members about the effects of your behavior on them.

The short-term benefits of behavior change can be an important motivating force. Although some people are motivated by long-term goals, such as avoiding a disease that may hit them in 30 years, most are more likely to be moved to action by shorter-term, more personal goals. Feeling better, doing better in school, improving at a sport, reducing stress, and increasing self-esteem are common short-term benefits of health behavior change.

**Boost Self-Efficacy** A big factor in your eventual success is whether you feel confident in your ability to change. **Self-efficacy** refers to your belief in your ability to successfully take action and perform a specific task. Strategies for boosting self-efficacy include developing an internal locus of control, using visualization and self-talk, and getting encouragement from supportive people.

**LOCUS OF CONTROL** Who do you believe is controlling your life? Is it your parents, friends, or school? Is it “fate”? Or is it you? **Locus of control** refers to the extent to which a person believes he or she has control over the events in his or her life. People who believe they are in control of their lives are said to have an *internal locus of control*. Those who believe that factors beyond their control determine the course of their lives are said to have an *external locus of control*.

For lifestyle management, an internal locus of control is an advantage because it reinforces motivation and commitment. An external locus of control can sabotage efforts to change behavior. For example, if you believe that you are destined to die of breast cancer because your mother died from the disease, you may view regular screening mammograms as a waste of time. In contrast, if you believe that you

can take action to reduce your risk of breast cancer despite hereditary factors, you will be motivated to follow guidelines for early detection of the disease.

If you find yourself attributing too much influence to outside forces, gather more information about your wellness-related behaviors. List all the ways that making lifestyle changes will improve your health. If you believe you’ll succeed, and if you recognize that you are in charge of your life, you’re on your way to wellness.

**VISUALIZATION AND SELF-TALK** One of the best ways to boost your confidence and self-efficacy is to visualize yourself successfully engaging in a new, healthier behavior. Imagine yourself going for an afternoon run three days a week or no longer smoking cigarettes. Also visualize yourself enjoying all the short-term and long-term benefits that your lifestyle change will bring.

You can also use *self-talk*, the internal dialogue you carry on with yourself, to increase your confidence in your ability to change. Counter any self-defeating patterns of thought with more positive or realistic thoughts: “I am a strong, capable person, and I can maintain my commitment to change.”

**ROLE MODELS AND SUPPORTIVE PEOPLE** Social support can make a big difference in your level of motivation and your chances of success. Perhaps you know people who have reached the goal you are striving for. They could be role models or mentors for you, providing information and support for your efforts. Gain strength from their experiences, and tell yourself, “If they can do it, so

can I.” Find a partner who wants to make the same changes you do and who can take an active role in your behavior change program. For example, an exercise partner can provide companionship and encouragement when you might be tempted to skip your workout.

**Identify and Overcome Barriers to Change** Don’t let past failures at behavior change discourage you. They can be a great source of information you can use to boost your chances of future success. Make a list of the problems and challenges you faced in any previous behavior change attempts. To this, add the short-term costs of behavior change that you identified in your analysis of the pros and cons of change. Once you’ve listed these key barriers to change, develop a practical plan for overcoming each one. For example, if you are not getting enough sleep when you’re with certain friends, decide in advance how you will turn down their next late-night invitation.

#### QUICK

#### STATS

**55% of U.S. adult smokers try to quit each year; only 7.6% succeed.**

—HealthyPeople.gov, 2016

**self-efficacy** The belief in your ability to take action and perform a specific task.

#### TERMS

**locus of control** The extent to which a person believes he or she has control over the events in his or her life.



## Enhancing Your Readiness to Change

The transtheoretical, or “stages of change,” model has been shown to be an effective approach to lifestyle self-management. To understand this model, what should you know? You should know your target behavior, which is the ideal place you want to end up. According to this model, you move through distinct stages of action as you achieve your target behavior. First, determine what stage you are in now so that you can choose appropriate strategies to progress through the cycle of change. This will help you enhance your readiness and intention to change. Read the following sections to determine what stage you are in. Let’s use exercise as an example of changing unhealthy behavior to active, engaging behavior.

**Precontemplation** At this stage, you think you have no problem and don’t intend to change your behavior. Here’s an example. Your friends have commented that you should exercise more, but you are resistant. You have tried to exercise in the past and now think your situation is hopeless. You are unaware of risks associated with being sedentary; and you also blame external factors like other people for your condition. You believe that there are more important reasons *not* to change than there are reasons to change.

To move forward in this stage, try raising your awareness. *Research* the importance of exercise, for example. Look up references that address the issue. How does exercise affect the body and mind? *Look also at the mechanisms you use to resist change*, such as denial or rationalization. Find ways to counteract these mechanisms of resistance.

*Seek social support.* Friends and family members can help you identify target behaviors (e.g., fitting in exercise into your time schedule or encouraging you while you work out). *Other resources* might include exercise classes or stress management workshops offered by your school.

**Contemplation** You now know you have a problem and within six months intend to do something about it, such as invite a friend to work out with you. You realize that getting more exercise will help decrease your stress level. You acknowledge the benefits of behavior change but are also aware that the barriers to change may be difficult to overcome. You consider possible courses of action but don’t know how to proceed.

To take charge, start by *keeping a journal*. Record what you have done so far and include your plan of action. *Do a cost-benefit analysis*: Identify the costs (e.g., it will cost money to take an exercise class) and benefits (e.g., I will probably stick to my goal if someone else is guiding me through the exercise). *Identify barriers to change* (e.g., I hate getting sweaty when I have no opportunity to shower). Knowing these obstacles can help you overcome them. Next, *engage your emotions*. Watch movies or read books about people with your target behavior. Imagine what your life will be like if you don’t change.

Other ways to move forward in the contemplation stage include *creating a new self-image* and thinking before you act.

*Imagine what you’ll be like* after changing your unhealthy behavior. Try to think of yourself in those new terms right now. *Learn why you engage in the unhealthy behavior*. Determine what “sets you off” and train yourself not to act reflexively.

**Preparation** You plan to take action within a month, or you may already have begun to make small changes in your behavior. You may have discovered a place to go jogging but have not yet gone regularly or consistently. You may have created a plan for change but are worried about failing.

*Work on creating a plan.* Include a start date, goals, rewards, and specific steps you will take to change your behavior. *Make change a priority.* Create and sign a contract with yourself. *Practice visualization and self-talk.* Say, “I see myself jogging three times a week and going to yoga on Fridays.” “I know I can do it because I’ve met challenging goals before.” *Take small steps.* Successfully practicing your new behavior for a short time—even a single day—can boost your confidence and motivation.

**Action** You outwardly modify your behavior and your environment. Maybe you start riding your bike to school or work. You put your stationary bicycle in front of the TV, and you leave your yoga mat out on your bedroom floor. The action stage requires the greatest commitment of time and energy, and people in this stage are at risk of relapsing into old, unhealthy patterns of behavior. *Monitor your progress.* Keep up with your journal entries. *Make changes* that will discourage the unwanted behavior—for example, park your car farther from your house or closer to the stairs. *Find alternatives* to your old behavior. Make a list of things you can do to replace the behavior.

*Reward yourself.* Rewards should be identified in your change plan. *Praise yourself* and focus on your success. *Involve your friends.* Tell them you want to change, and ask for their help. Don’t get discouraged. Real change is difficult.

**Maintenance** You have maintained your new, healthier lifestyle for at least six months by working out and riding your bike. Lapses have occurred, but you have been successful in quickly reestablishing the desired behavior. The maintenance stage can last months or years.

*Keep going.* Continue using the positive strategies that worked in earlier stages. And *be prepared for lapses*. If you find yourself skipping exercise class, don’t give up on the whole project. Try inviting a friend to join you and then keep the date. *Be a role model.* Once you successfully change your behavior, you may be able to help someone do the same thing.

**Termination** For some behaviors, you may reach the sixth and final stage of termination. At this stage, you have exited the cycle of change and are no longer tempted to lapse back into your old behavior. You have a new self-image and total control with regard to your target behavior.



## Dealing with Relapse

People seldom progress through the stages of change in a straightforward, linear way. Rather, they tend to move to a certain stage and then slip back to a previous stage before resuming their forward progress. Research suggests that most people make several attempts before they successfully change a behavior, and four out of five people experience some degree of backsliding. For this reason, the stages of change are best conceptualized as a spiral in which people cycle back through previous stages but are farther along in the process each time they renew their commitment (Figure 1.4).

If you experience a lapse (a single slip) or a relapse (a return to old habits), don't give up. Relapse can be demoralizing, but it is not the same as failure; failure means stopping before you reach your goal and never changing your target behavior. During the early stages of the change process, it's a good idea to plan for relapse so that you can avoid guilt and self-blame and get back on track quickly. Forgive yourself for the slip, give yourself credit for the progress you have already made, and move on.

If relapses keep occurring or you can't seem to control them, you may need to return to a previous stage of the behavior change process. If this is necessary, reevaluate your goals and strategy. A different or less stressful approach may help you avoid setbacks when you try again.

## Developing Skills for Change: Creating a Personalized Plan

Once you are committed to making a change, put together a plan of action. Your key to success is a well-thought-out plan that sets goals, anticipates problems, and includes rewards.



**FIGURE 1.4** The stages of change: A spiral model.

**SOURCE:** Adapted from Centers for Disease Control and Prevention. n.d. *PEP Guide: Personal Empowerment Plan for Improving Eating and Increasing Physical Activity*. Dallas, TX: The Cooper Institute.

**1. Monitor Your Behavior and Gather Data** Keep a record of your target behavior and the circumstances surrounding it. Record this information for at least a week or two. Keep your notes in a health journal or notebook or on your computer (see the sample journal entries in Figure 1.5). Record each occurrence of your behavior, noting what the activity was, when and where it happened, what you were doing, and how you felt at that time.

For example, if your goal is to start an exercise program, track your activities to determine how to make time for workouts.

**2. Analyze the Data and Identify Patterns** After you have collected data on the behavior, analyze the data to identify patterns. When are you most likely to overeat? To skip a meal? What events trigger your appetite? Perhaps you are especially hungry at midmorning or when you put off eating dinner until 9:00. Perhaps you overindulge in food and drink when you go to a particular restaurant or when you're with certain friends. Note the connections between your feelings and such external cues as time of day, location, situation, and the actions of others around you.

**3. Be “SMART” about Setting Goals** If your goals are too challenging, you will have trouble making steady progress and will be more likely to give up altogether. If, for example, you are in poor physical condition, it will not make sense to set a goal of being ready to run a marathon within two months. If you set goals you can live with, it will be easier to stick with your behavior change plan and be successful.

Experts suggest that your goals meet the “SMART” criteria; that is, your behavior change goals should be

- **Specific.** Avoid vague goals like “eat more fruits and vegetables.” Instead state your objectives in specific terms, such as “eat two cups of fruit and three cups of vegetables every day.”

- **Measurable.** Recognize that your progress will be easier to track if your goals are quantifiable, so give your goal a number. You might measure your goal in terms of time (such as “walk briskly for 20 minutes a day”), distance (“run two miles, three days per week”), or some other amount (“drink eight glasses of water every day”).

- **Attainable.** Set goals that are within your physical limits. For example, if you are a poor swimmer, you might not be able to meet a short-term fitness goal by swimming laps. Walking or biking might be better options.

- **Realistic.** Manage your expectations when you set goals. For example, a long-time smoker may not be able to quit cold turkey. A more realistic approach might be to use nicotine replacement patches or gum for several weeks while getting help from a support group.

- **Time frame-specific.** Give yourself a reasonable amount of time to reach your goal, state the time frame in your behavior change plan, and set your agenda to meet the goal within the given time frame.

Date <u>November 5</u> Day M <u>TU</u> W TH F SA SU										
Time of day	M/S	Food eaten	Cals.	H	Where did you eat?	What else were you doing?	How did someone else influence you?	What made you want to eat what you did?	Emotions and feelings?	Thoughts and concerns?
7:30	M	1 C Crispix cereal 1/2 C skim milk coffee, black 1 C orange juice	110 40 — 120	3	home	looking at news headlines on my phone	alone	I always eat cereal in the morning	a little keyed up & worried	thinking about quiz in class today
10:30	S	1 apple	90	1	hall outside classroom	studying	alone	felt tired & wanted to wake up	tired	worried about next class
12:30	M	1 C chili 1 roll 1 pat butter 1 orange 2 oatmeal cookies 1 soda	290 120 35 60 120 150	2	campus food court	talking	eating w/ friends; we decided to eat at the food court	wanted to be part of group	excited and happy	interested in hearing everyone's plans for the weekend
M/S = Meal or snack H = Hunger rating (0–3)										

FIGURE 1.5 Sample health journal entries.

Using these criteria, sedentary people who want to improve their health and build fitness might set a goal of being able to run three miles in 30 minutes, to be achieved within a time frame of six months. To work toward that goal, they might set a number of smaller, intermediate goals that are easier to achieve. For example, their list of goals might look like this:

WEEK	FREQUENCY (DAYS/WEEK)	ACTIVITY	DURATION (MINUTES)
1	3	Walk < 1 mile	10–15
2	3	Walk 1 mile	15–20
3	4	Walk 1–2 miles	20–25
4	4	Walk 2–3 miles	25–30
5–7	3–4	Walk/run 1 mile	15–20
⋮			
21–24	4–5	Run 2–3 miles	25–30

For some goals and situations, it may make more sense to focus on something other than your outcome goal. If you are in an early stage of change, for example, your goal may be to learn more about the risks associated with your target behavior or to complete a cost-benefit analysis. If your goal involves a long-term lifestyle change, such as reaching a healthy weight, focus on developing healthy habits rather than targeting a specific weight loss. Your goal in this case might be exercising for 30 minutes every day, reducing portion sizes, or eliminating late-night snacks.

**4. Devise a Plan of Action** Develop a strategy that will support your efforts to change. Your plan of action should include the following steps:

- **Get what you need.** Identify resources that can help you. For example, you can join a community walking club or sign

up for a smoking cessation program. You may also need to buy some new running shoes or nicotine replacement patches. Get the items you need right away; waiting can delay your progress.

- **Modify your environment.** If you have cues in your environment that trigger your target behavior, control them. For example, if you typically have alcohol at home, getting rid of it can help prevent you from indulging. If you usually study with a group of friends in an environment that allows smoking, move to a nonsmoking area. If you always buy a snack at a certain vending machine, change your route so that you don't pass by it.

- **Control related habits.** You may have habits that contribute to your target behavior. Modifying these habits can help change the behavior. For example, if you usually plop down on the sofa while watching TV, try putting an exercise bike in front of the set so that you can burn calories while watching your favorite programs.

- **Reward yourself.** Giving yourself instant, real rewards for good behavior will reinforce your efforts. Plan your rewards; decide in advance what each one will be and how you will earn it. Tie rewards to achieving specific goals or sub-goals. For example, you might treat yourself to a movie after a week of avoiding snacks. Make a list of items or events to use as rewards. They should be special to you and preferably unrelated to food or alcohol.

- **Involve the people around you.** Tell family and friends about your plan and ask them to help. To help them respond appropriately to your needs, create a specific list of dos and don'ts. For example, ask them to support you when you set aside time to exercise or avoid second helpings at dinner.

## Ask Yourself

### QUESTIONS FOR CRITICAL THINKING AND REFLECTION

Think about the last time you made an unhealthy choice instead of a healthy one. How could you have changed the situation, the people in the situation, or your own thoughts, feelings, or intentions to avoid making that choice? What can you do in similar situations in the future to produce a different outcome?

- **Plan for challenges.** Think about situations and people that might derail your program and develop ways to cope with them. For example, if you think it will be hard to stick to your usual exercise program during exams, schedule short bouts of physical activity (such as a brisk walk) as stress-reducing study breaks.

**5. Make a Personal Contract** A serious personal contract—one that commits you to your word—can result in a better chance of follow-through than a casual, offhand promise. Your contract can help prevent procrastination by specifying important dates and can also serve as a reminder of your personal commitment to change.

Your contract should include a statement of your goal and your commitment to reaching it. The contract should also include details such as your start date, the steps you will take to measure your progress, the strategies you plan to use to promote change, and the date you expect to reach your final goal.

Have someone—preferably someone who will be actively helping you with your program—sign your contract as a witness.

Figure 1.6 shows a sample behavior change contract for someone who is committing to eating more fruit every day.

You can apply the general behavior change planning framework presented in this chapter to any target behavior. Additional examples of behavior change plans appear in the Behavior Change Strategy sections at the end of many chapters in this text. In these sections, you will find specific plans for quitting smoking, starting an exercise program, and making other positive lifestyle changes.

## Putting Your Plan into Action

When you're ready to put your plan into action, you need commitment—the resolve to stick with the plan no matter what temptations you encounter. Remember all the reasons you have to make the change—and remember that *you* are the boss. Use all your strategies to make your plan work. Make sure your environment is change-friendly, and get as much support and encouragement from others as possible. Keep track of your progress in your health journal and give yourself regular rewards. And don't forget to give yourself a pat on the back—congratulate yourself, notice how much better you look or feel, and feel good about

### Behavior Change Contract

1. I, Tammy Lau, agree to increase my consumption of fruit from 1 cup per week to 2 cups per day.
2. I will begin on 10/5 and plan to reach my goal of 2 cups of fruit per day by 12/7
3. To reach my final goal, I have devised the following schedule of mini-goals. For each step in my program, I will give myself the reward listed.  
I will begin to have  $\frac{1}{2}$  cup of fruit with breakfast 10/5 see movie  
I will begin to have  $\frac{1}{2}$  cup of fruit with lunch 10/26 new video game  
I will begin to substitute fruit 11/16 concert  
juice for soda 1 time per day  
My overall reward for reaching my goal will be trip to beach
4. I have gathered and analyzed data on my target behavior and have identified the following strategies for changing my behavior: Keep the fridge stocked with easy-to-carry fruit. Pack fruit in my backpack every day. Buy lunch at place that serves fruit.
5. I will use the following tools to monitor my progress toward my final goal: Chart on fridge door  
Health journal  
I sign this contract as an indication of my personal commitment to reach my goal: Tammy Lau 9/28  
I have recruited a helper who will witness my contract and also increase his consumption of fruit; eat lunch with me twice a week.  
Eric March 9/28

FIGURE 1.6 A sample behavior change contract.

## Ask Yourself

### QUESTIONS FOR CRITICAL THINKING AND REFLECTION

Have you tried to change a behavior in the past, such as exercising more or quitting smoking? How successful were you? Do you feel the need to try again? If so, what would you do differently to improve your chances of success?

how far you've come and how you've gained control of your behavior.

## BEING HEALTHY FOR LIFE

Your first few behavior change projects may never go beyond the planning stage. Those that do may not all succeed. But as you begin to see progress and changes, you'll start to experience new and surprising positive feelings about yourself. You'll probably find that you're less likely to buckle under stress. You may accomplish things you never thought possible—running a marathon, traveling abroad, or finding a rewarding relationship. Being healthy takes extra effort, but the paybacks in energy and vitality are priceless.

Once you've started, don't stop. Remember that maintaining good health is an ongoing process. Tackle one area at a

time, but make a careful inventory of your health strengths and weaknesses and lay out a long-range plan. Take on the easier problems first, and then use what you have learned to attack more difficult areas. Keep informed about the latest health news and trends; research is continually providing new information that directly affects daily choices and habits.

You can't completely control every aspect of your health. At least three other factors—heredity, health care, and environment—play important roles in your well-being. After you quit smoking, for example, you may still be inhaling smoke from other people's cigarettes. Your resolve to eat better foods may suffer a setback when you have trouble finding healthy choices on campus.

But you can make a difference—you can help create an environment around you that supports wellness for everyone. You can support nonsmoking areas in public places. You can speak up in favor of more nutritious foods and better physical fitness facilities. You can provide nonalcoholic drinks at your parties.

You can also work on larger environmental challenges: air and water pollution, traffic congestion, overcrowding and overpopulation, global warming and climate change, toxic and nuclear waste, and many others. These difficult issues need the attention and energy of people who are informed and who care about good health. On every level, from personal to planetary, we can all take an active role in shaping our environment.

## TIPS FOR TODAY AND THE FUTURE



You are in charge of your health. Many of the decisions you make every day have an impact on the quality of your life, both now and in the future. By making positive choices, large and small, you help ensure a lifetime of wellness.

### RIGHT NOW YOU CAN:

- Go for a 15-minute walk.
- Have a piece of fruit for a snack.
- Call a friend and arrange a time to catch up with each other.
- Think about whether you have a health behavior you'd like to change. If you do, consider the elements of a behavior change strategy. For example, begin a mental list of the pros and cons of the behavior, or talk to someone who can support you in your attempts to change.

### IN THE FUTURE YOU CAN:

- Stay current on health- and wellness-related news and issues.
- Participate in health awareness and promotion campaigns in your community—for example, support smoking restrictions at local venues.
- Be a role model for (or at least be supportive of) someone else who is working on a health behavior you have successfully changed.

## SUMMARY

- Wellness is the ability to live life fully, with vitality and meaning. Wellness is dynamic and multidimensional. It incorporates physical, emotional, intellectual, interpersonal, cultural, spiritual, environmental, financial, and occupational dimensions.
- As chronic diseases have emerged as major health threats in the United States, people must recognize that they have greater control over, and greater responsibility for, their health than ever before.
- With new health insurance options and the Healthy People initiative, the U.S. government is seeking to achieve a better quality of life for all Americans.
- Health-related disparities that have implications for wellness can be described in the context of sex and gender, race and ethnicity, income and education, disability, geographic location, and sexual orientation and gender identity.
- Although heredity, environment, and health care all play roles in wellness and disease, behavior can mitigate their effects.
- To make lifestyle changes, you need information about yourself, your health habits, and resources available to help you change.
- You can increase your motivation for behavior change by examining the benefits and costs of change, boosting self-efficacy, and identifying and overcoming key barriers to change.
- The “stages of change” model describes six stages that people move through as they try to change their behavior: precontemplation, contemplation, preparation, action, maintenance, and termination.
- You can develop a specific plan for change by (1) monitoring your behavior by keeping a journal; (2) analyzing those data; (3) setting specific goals; (4) devising strategies for modifying the environment, rewarding yourself, and involving others; and (5) making a personal contract.
- To start and maintain a behavior change program, you need commitment, a well-developed plan, social support, and a system of rewards.
- Although you cannot control every aspect of your health, you can make a difference in helping create an environment that supports wellness for everyone.

## FOR MORE INFORMATION

The internet addresses listed here were accurate at the time of publication.

*Centers for Disease Control and Prevention (CDC).* The CDC provides a wide variety of health information for researchers and the general public.

<http://www.cdc.gov>

*Federal Deposit Insurance Corporation.* “Money Smart for Young Adults” is a free source of information, unaffiliated with commercial

# BEHAVIOR CHANGE STRATEGY

## Behavior Change Contract

1. I, \_\_\_\_\_, agree to \_\_\_\_\_

2. I will begin on \_\_\_\_\_ and plan to reach my goal of \_\_\_\_\_ by \_\_\_\_\_

3. To reach my final goal, I have devised the following schedule of mini-goals. For each step in my program, I will give myself the reward listed.

Mini-goal	Target date	Reward
_____	_____	_____
_____	_____	_____
_____	_____	_____

My overall reward for reaching my goal will be \_\_\_\_\_

4. I have gathered and analyzed data on my target behavior and have identified the following strategies for changing my behavior:

\_\_\_\_\_

\_\_\_\_\_

5. I will use the following tools to monitor my progress toward my final goal: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

I sign this contract as an indication of my personal commitment to reach my goal: \_\_\_\_\_

\_\_\_\_\_

I have recruited a helper who will witness my contract and \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

interests, that includes eight modules on topics such as “borrowing basics” and “paying for college and cars.”

<http://www.fdic.gov/consumers/consumer/moneysmart/young.html>

*Federal Trade Commission: Consumer Protection—Health.* Includes online brochures about a variety of consumer health topics, including fitness equipment, generic drugs, and fraudulent health claims.

<http://www.ftc.gov/health>

*Healthfinder.* A gateway to online publications, websites, support and self-help groups, and agencies and organizations that produce reliable health information.

<http://healthfinder.gov>

*Healthy People.* Provides information on Healthy People objectives and priority areas.

<http://www.healthypeople.gov>

*MedlinePlus.* Provides links to news and reliable information about health from government agencies and professional associations; also includes a health encyclopedia and information about prescription and over-the-counter drugs.

<http://medlineplus.gov>

*National Health Information Center (NHIC).* Puts consumers in touch with the organizations that are best able to provide answers to health-related questions.

<http://www.health.gov/nhic/>

*National Institutes of Health (NIH).* Provides information about all NIH activities as well as consumer publications, hotline information, and an A-to-Z listing of health issues with links to the appropriate NIH institute.

<http://www.nih.gov>

*National Wellness Institute.* Serves professionals and organizations that promote health and wellness.

<http://www.nationalwellness.org>

*Office of Minority Health.* Promotes improved health among racial and ethnic minority populations.

<http://minorityhealth.hhs.gov>

*Office on Women's Health.* Provides information and answers to frequently asked questions.

<http://www.womenshealth.gov>



*Surgeon General*. Includes information on activities of the Surgeon General and the text of many key reports on topics such as tobacco use, physical activity, and mental health.

<http://www.surgeongeneral.gov>

*World Health Organization (WHO)*. Provides information about health topics and issues affecting people around the world.

<http://www.who.int/en>

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## CHAPTER OBJECTIVES

- Explain what stress is
- Describe the relationship between stress and health
- List common sources of stress
- Describe and apply techniques for managing stress

# Stress: The Constant Challenge

CHAPTER

2

**L**ike the term *wellness*, *stress* is a word many people use without understanding its precise meaning. Stress is popularly viewed as an uncomfortable response to a negative event, which probably describes *nervous tension* more than the cluster of physical and psychological responses that actually constitutes stress. In fact, stress is not limited to negative situations; it is also a response to pleasurable physical challenges and the achievement of personal goals.

Whether stress is experienced as pleasant or unpleasant depends largely on the situation and the individual. Learning effective responses to stress can enhance psychological health and help prevent a number of serious diseases, and stress management can be an important part of daily life.

As a college student, you may be in one of the most stressful times of your life. This chapter explains the physiological and psychological reactions that make up the stress response and describes how these reactions can put your health at risk. The chapter also discusses the most common sources of stress and offers methods of managing stress in your life.

## WHAT IS STRESS?

In common usage, the term *stress* refers to two things: the mental states or events that trigger physical and psychological reactions (e.g., “That relationship is way too much stress”), and the reactions themselves (e.g., “I feel a lot of stress every time I walk into that classroom”). We use the more precise term **stressor** for a physical or psychological event that triggers physical and emotional reactions and the term **stress response** for the reactions themselves. Thoughts or feelings about an approaching event can be just as stressful as the event itself. A first date or a final exam can be a stressor that leads to sweaty

**stressor** Any physical or psychological event or condition that produces physical and psychological reactions.

### TERMS

**stress response** The physical and emotional reactions to a stressor.

palms and a pounding heart, symptoms of the stress response. We use the term **stress** to describe the general physical and emotional state that accompanies the stress response (e.g., “I take a day at the beach when I feel stressed”).

Each individual’s experience of stress depends on many factors, including the nature of the stressor and how it is perceived. Stressors take many different forms. Like a fire in your home, some occur suddenly and neither last long nor repeat. Others, like air pollution or quarreling parents, can continue for a long time. The memory of a stressful occurrence, such as the memory of the loss of a loved one, can itself be a stressor years after the event. Responses to stressors can include a wide variety of physical, cognitive, behavioral, and emotional changes. A short-term response might be an upset stomach or insomnia; a long-term response might be a change in your personality or social relationships.

## Physical Responses to Stressors

Imagine a close call: As you step off the curb, a car careens toward you. With just a fraction of a second to spare, you leap safely out of harm’s way. In that split second of danger and in the moments that follow, you experience a predictable series of physical reactions. Your body goes from a relaxed state to one prepared for physical action to cope with a threat to your life.

Two systems in your body are responsible for your physical response to stressors: the nervous system and the endocrine

system. Through rapid chemical reactions affecting almost every part of your body, you are primed to act quickly and appropriately in time of danger.

**The Nervous System** The **nervous system** consists of the brain, spinal cord, and nerves. Part of the nervous system is under voluntary control, as when you tell your arm to reach for an orange. The part that is *not* under conscious supervision—for example, the part that controls the digestion of the orange—is the **autonomic nervous system**. In addition to digestion, it controls your heart rate, breathing, blood pressure, and hundreds of other involuntary functions.

The autonomic nervous system consists of two divisions:

- The **parasympathetic division** is in control when you are relaxed. It aids in digesting food, storing energy, and promoting growth.
- The **sympathetic division** is activated when your body is stimulated, for example, by exercise, and when you face an emergency and experience severe pain, anger, or fear.

Sympathetic nerves use the neurotransmitter norepinephrine (or *noradrenaline*) to affect nearly every organ, sweat gland, blood vessel, and muscle to enable your body to handle an emergency. In general, the sympathetic division commands your body to stop storing energy and to use it in response to a crisis.

## How the Nervous and Endocrine Systems Work Together

During stress, the sympathetic nervous system triggers the **endocrine system**. This system of glands, tissues, and cells helps control body functions by releasing **hormones** and other chemical messengers into the bloodstream to influence metabolism and other body processes. The nervous system handles very short-term stress, whereas the endocrine system deals with both short-term (*acute*) and long-term (*chronic*) stress. How do both systems work together in an emergency? Higher cognitive areas in your brain decide that you are facing a threat. The nervous and endocrine systems activate adrenal glands, which are located near the top of the kidneys. These glands release the hormones **cortisol** and **epinephrine** (also called adrenaline). These hormones then trigger a basic set of physical reactions to stressors (as shown in Figure 2.1), including the following:

- Heart and respiration rates accelerate to speed oxygen through the body.
- Hearing and vision become more acute.
- The liver releases extra sugar into the bloodstream to boost energy.
- Perspiration increases to cool the skin.
- The brain releases **endorphins**—chemicals that can inhibit or block sensations of pain—in case you are injured.

As a group, these nearly instantaneous physiological changes are called the **fight-or-flight reaction**. They give you the heightened reflexes and strength you need to dodge a car

**stress** The general physical and emotional state that the stressor produces.

### TERMS

**nervous system** The brain, spinal cord, and nerves.

**autonomic nervous system** The part of the nervous system that controls certain basic body processes; consists of the sympathetic and parasympathetic divisions.

**parasympathetic division** The part of the autonomic nervous system that moderates the excitatory effect of the sympathetic division, slowing metabolism and restoring energy supplies.

**sympathetic division** Division of the autonomic nervous system that reacts to danger or other challenges by accelerating body processes.

**endocrine system** The system of glands, tissues, and cells that secrete hormones into the bloodstream to influence metabolism and other body processes.

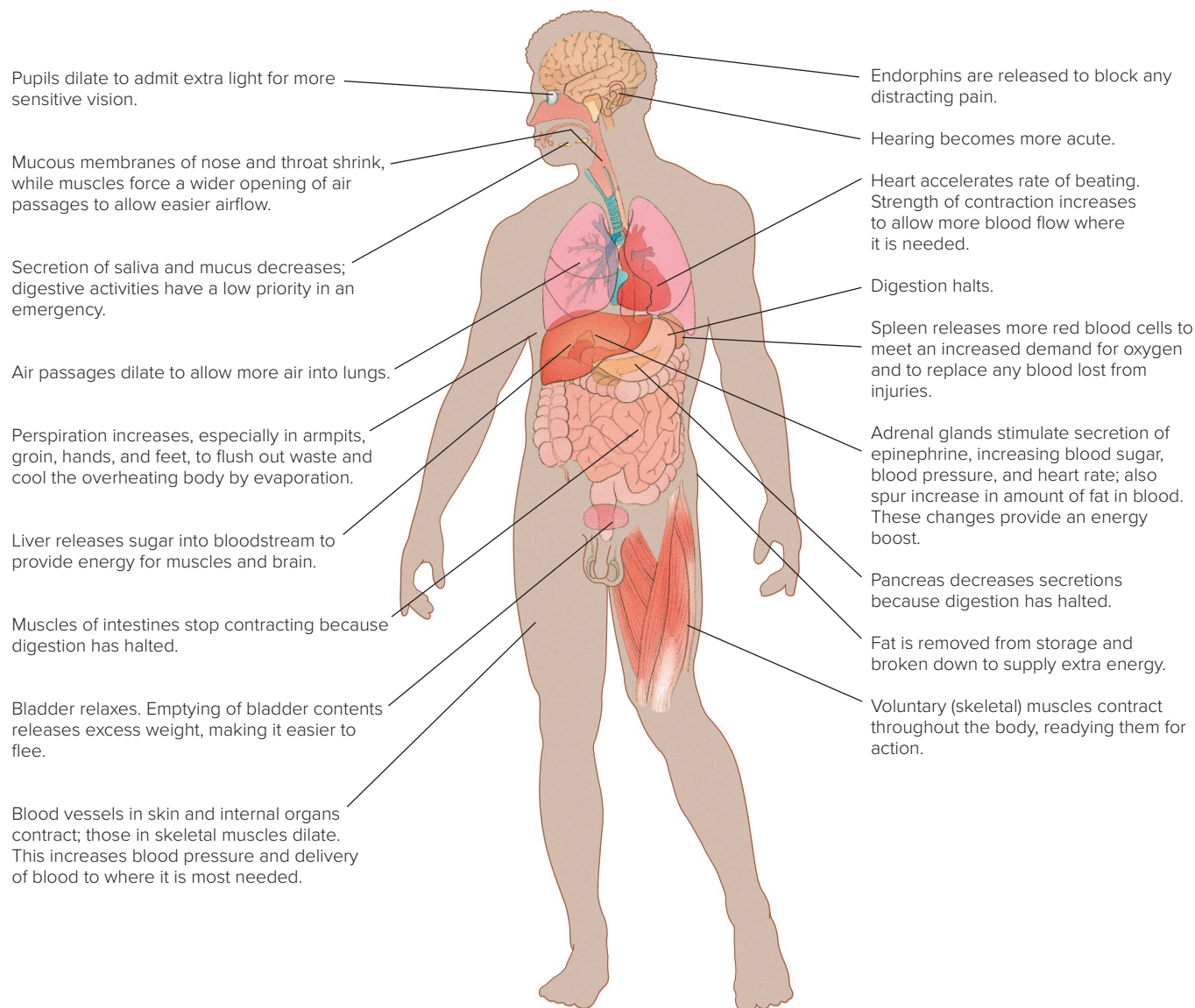
**hormone** A chemical messenger produced in the body and transported in the bloodstream to target cells or organs for specific regulation of their activities.

**cortisol** A steroid hormone secreted by the cortex (outer layer) of the adrenal gland; also called *hydrocortisone*.

**epinephrine** A hormone secreted by the medulla (inner core) of the adrenal gland that affects the functioning of organs involved in responding to a stressor; also called *adrenaline*.

**endorphins** Brain secretions that have pain-inhibiting effects.

**fight-or-flight reaction** A defense reaction that prepares a person for conflict or escape by triggering hormonal, cardiovascular, metabolic, and other changes.



**FIGURE 2.1 The fight-or-flight reaction.** In response to a stressor, the autonomic nervous system and the endocrine system prepare the body to deal with an emergency.

or respond to other stressors. Although these physiological changes may vary in intensity, the same basic set of physiological reactions occurs in response to any type of stressor—positive or negative, physiological or psychological.

**The Return to Homeostasis** A short time after your near miss with the car, you begin to feel normal again. Once a stressful situation ends, the parasympathetic division of your autonomic nervous system takes command and halts the stress response. It restores **homeostasis**, a state of balance in which blood pressure, heart rate, hormone levels, and other vital functions are maintained within a narrow range of normal. Your parasympathetic nervous system calms your body, slowing a rapid heartbeat, drying sweaty palms, and returning breathing to normal. Gradually your body resumes its normal “housekeeping” functions, such as digestion and temperature regulation. Damage that may have been sustained during the

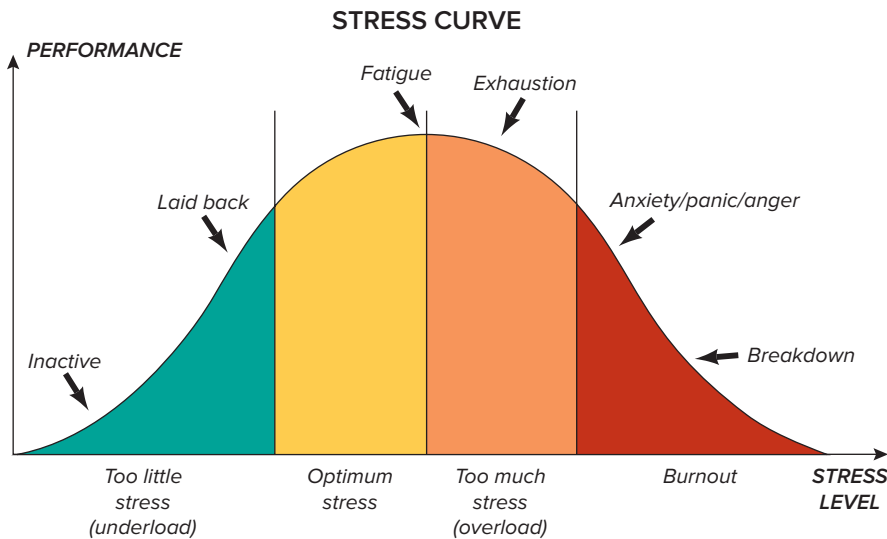
fight-or-flight reaction is repaired (e.g., the extra blood sugar produced to give you more energy is reabsorbed into the bloodstream rather than increasing your risk for diabetes). The day after you narrowly dodge the car, you wake up feeling fine. In this way, your body can grow, repair itself, and acquire new reserves of energy. When the next crisis comes, you’ll be ready to respond again instantly.

**The Fight-or-Flight Reaction in Modern Life** The fight-or-flight reaction is part of our biological heritage, a survival mechanism that has served humans well. In modern life, however, it is often absurdly inappropriate. Many of the

**homeostasis** A state of stability and consistency in an individual’s physiological functioning.

**TERMS**





**FIGURE 2.2 Stress level, performance, and well-being.** A moderate level of stress challenges individuals in a way that promotes optimal performance and well-being. Too little stress, and people are not challenged enough to improve; too much stress, and the challenges become stressors that can impair physical and emotional health.

**SOURCE:** Babson College. 2018. Stress ([babson.edu/student-life/health-wellness/health-promotion/Pages/stress.aspx](http://babson.edu/student-life/health-wellness/health-promotion/Pages/stress.aspx))

stressors we face in everyday life—an exam, a mess left by a roommate, or a stoplight—do not require a physical response. The fight-or-flight reaction prepares the body for physical action regardless of whether a particular stressor necessitates such a response.

## Cognitive and Psychological Responses to Stressors

We all experience a similar set of physical responses to stressors (the fight-or-flight reaction). These responses, however, vary from person to person and from one situation to another. People’s perceptions of potential stressors—and of their reactions to such stressors—can vary greatly, depending on our cognitive and psychological framework. You may feel confident about taking exams but be nervous about talking to people you don’t know. Your roommate, in contrast, may thrive in challenging social situations but may dread taking tests. Our individual ways of perceiving things play a significant role in the stress equation.

**Cognitive Responses** Your *cognitive appraisal* of a potential stressor is the thinking through the consequences of certain thoughts or behaviors, the processing of information. Two cognitive factors that can reduce the magnitude of the stress response are successful prediction and the perception of control. For instance, receiving a course syllabus at the

beginning of the term allows you to predict the timing of major deadlines and exams. Having this predictive knowledge also allows you to exert some control over your study plans, which can help reduce the stress caused by exams.

The facts of a situation—Who? What? Where? When?—typically are evaluated fairly consistently from person to person. But evaluation with respect to personal outcome can vary: What does this mean for me? Can I do anything about it? Will it improve or worsen?

If a person perceives a situation as exceeding her or his ability to cope, the result can be negative emotions and an inappropriate stress response. If, by contrast, a person perceives a situation as a challenge that is within her or his ability to manage, more positive and appropriate responses are likely. A certain amount of stress, if coped with appropriately, can help promote optimal performance (Figure 2.2).

**Psychological Responses** Psychological responses to stressors include cognitive ones, and they generally imply more emotion. Common psychological responses to stressors include anxiety, depression, and fear. Although emotional responses are determined in part by personality or temperament, we often moderate or learn to control them. Coping techniques that promote wellness and enable us to function at our best are discussed later in the chapter. Ineffective coping to stressors includes overeating; expressing hostility; and using tobacco, alcohol, or other drugs.

There are many factors that influence how each person responds to stress. Personality, cultural background, gender, and individual experience are important to consider when dealing with stressful situations.

**PERSONALITY** Some **personality** traits enable people to deal more effectively with stress. One such trait is *hardiness*, a particular form of optimism. People with a hardy personality view potential stressors as challenges and opportunities for growth and learning, rather than as burdens. They see fewer situations as stressful and react less intensely to stress than nonhardy people. Hardy people are committed to their activities, have a sense of inner purpose and an inner locus of control, and feel mostly in control of their lives.

Another psychological characteristic that prompts us to behave in a certain way is motivation. Two types of motivation have been studied that relate to stress and health. *Stressed power motivation* is associated with people who are aggressive and argumentative and who need to have power over others. One study of college students found that persons with this personality trait tend to get sick when their need for power is blocked or threatened. In contrast, people with *unstressed affiliation motivation*

**personality** The sum of behavioral, cognitive, and emotional tendencies.

**TERMS**





A person's emotional and behavioral responses to stressors depend on many factors, including personality, gender, and cultural background. ©Fancy/Alamy

are drawn to others and want to be liked as friends. The same study of college students found that students with this trait reported the least illness. Another important personality trait—**resilience**—is especially associated with social and academic success in groups at risk for stress, such as people from low-income families and those with mental or physical disabilities. Resilient people tend to face adversity by accepting the reality of their situation, holding to a belief that life is meaningful, and being able to improvise.

Academic resilience helps college students flourish. Whether they need to bounce back from a poor grade or negative feedback, or master the art of juggling multiple academic pressures, students can learn techniques to stay and become resilient. One technique is to identify resources such as peers and counselors to lean on in times of crisis.

Contemporary research is repeatedly demonstrating that you can change some basic elements of your personality as well as your typical behaviors and patterns of thinking by using positive stress management techniques like those described later in this chapter.

**CULTURAL BACKGROUND** Young adults from around the world come to the United States for a higher education; most students finish college with a greater appreciation for other cultures and worldviews. The clash of cultures, however, can be a big source of stress for many students—especially when it leads to disrespectful treatment, harassment, or violence. It is important to consider that our reactions to stressful events are influenced by family and cultural background. Learning to appreciate the cultural backgrounds of other people can be both a mind-opening experience and a way to avoid stress over cultural differences.

**GENDER** Your **gender role**—the activities, abilities, and behaviors your culture expects of you based on your sex—

can affect your experience of stress. Some behavioral responses to stressors, such as crying or openly expressing anger, may be deemed more appropriate for one gender than another.

Strict adherence to gender roles, however, can limit one's response to stress and can itself become a source of stress. Gender roles can also affect one's perception of a stressor. If a man derives most of his self-worth from his work, for example, retirement may be more stressful for him than for a woman whose self-image is based on several different roles.

Since the American Psychological Association began its yearly Stress in America survey in 2007, women have reported a higher level of stress than men. In 2016, 12% of female college students reported “tremendous stress,” as compared to 9% of male college students. In her book *Overwhelmed*, Brigid Schulte describes a continuing unequal gendered division of labor: Families are working more hours than they used to, but American women spend even more time with their children than they did in the 1960s. How is this possible? Mothers tend to choose jobs that are flexible rather than high powered, and they spend less time cleaning (either hiring someone else or leaving their houses dirtier), sleep less, and take less time for themselves.

**EXPERIENCE** Past experiences can profoundly influence the evaluation of a potential stressor. If you had a bad experience giving a speech in the past, you are much more likely to perceive an upcoming speech as stressful than someone who has had positive public-speaking experiences. Effective behavioral responses, such as preparing carefully and visualizing success, can help overcome the effects of negative past experiences.

## Ask Yourself

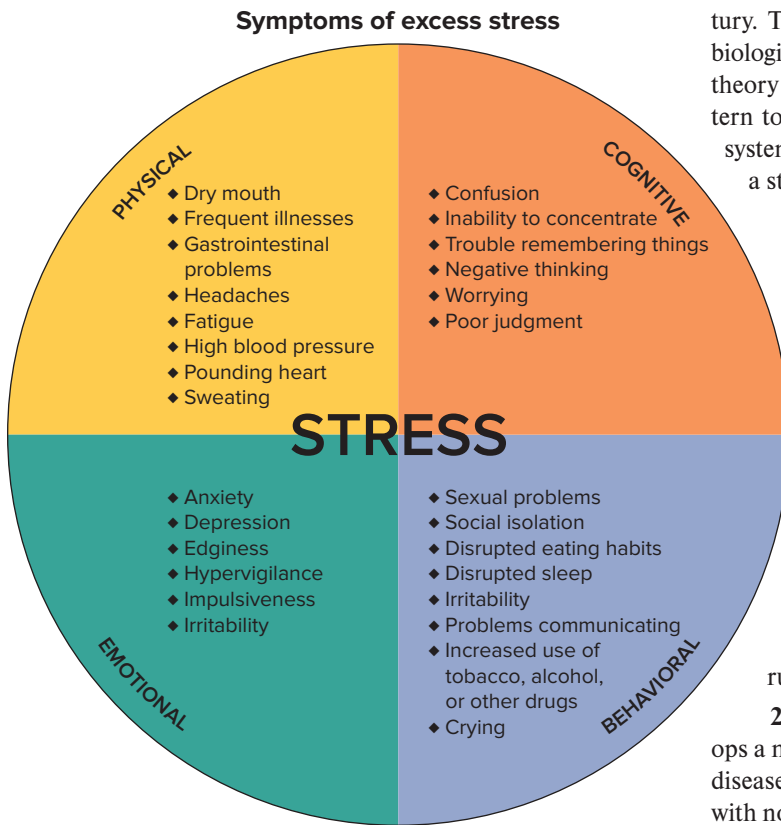
### QUESTIONS FOR CRITICAL THINKING AND REFLECTION

Think of the last time you faced a significant stressor. How did you react? List the physical, cognitive, behavioral, and emotional reactions you experienced. Were the reactions appropriate to the circumstances? Did these reactions help you better deal with the stress, or did they interfere with your efforts to handle it?

**resilience** A personality trait associated with the ability to face adversity and recover quickly from difficulties.

### TERMS

**gender role** A culturally expected pattern of behavior and attitudes determined by a person's sex.



**FIGURE 2.3** Physical, cognitive, behavioral, and emotional symptoms of excess stress.

## STRESS AND HEALTH

According to the American Psychological Association's Stress in America survey, the average overall stress level among Americans rose between 2016 and 2017, the first significant increase since the survey began in 2007. Increased stress rates corresponded to higher levels of physical and emotional stress symptoms: 80% of respondents reported having at least one symptom of stress in the past month. The role of stress in health is complex, but evidence suggests that stress can increase vulnerability to many ailments (Figure 2.3).

## The General Adaptation Syndrome

The concepts of homeostasis and adaptations to stressors came from the work of several scientists across the 20th cen-

tury. The **general adaptation syndrome (GAS)**, developed by biologist Hans Selye beginning in the 1930s and 1940s, is a theory that describes a universal and predictable response pattern to all stressors. It identifies an automatic self-regulation system of the mind and body that tries to return the body to a state of homeostasis after it is subjected to stress.

Some stressors, such as attending a party, are viewed as pleasant, while others, such as getting a bad grade, are viewed as unpleasant. In the GAS theory, stress triggered by a positive stressor is called **eustress**; stress triggered by a negative stressor is called **distress**. The sequence of physical responses associated with the GAS is the same for both eustress and distress and occurs in three stages (see Figure 2.4).

**1. Alarm.** The alarm stage includes the complex sequence of events brought on by the fight-or-flight reaction. At this stage, the body is more susceptible to disease or injury because it is geared up to deal with a crisis. Someone in this phase may experience headaches, indigestion, anxiety, and disrupted sleeping and eating patterns.

**2. Resistance.** Under continued stress, the body develops a new level of homeostasis in which it is more resistant to disease and injury than usual. In this stage, a person can cope with normal life and added stress. However, at some point the body's resources will become depleted.

**3. Exhaustion.** The first two stages of GAS require a great deal of energy. If a stressor persists, or if several stressors occur in succession, general exhaustion sets in. This is not the sort of exhaustion you feel after a long, busy day. Rather, it's a life-threatening physiological exhaustion. The body's resources are depleted, and the body is unable to maintain normal function. If this stage is extended, long-term damage may result, manifesting itself in ulcers, digestive system trouble, depression, diabetes, cardiovascular problems, and/or mental illnesses.

## Allostatic Load

The wear and tear on the body that results from long-term exposure to repeated or chronic stress is called the **allostatic load**. A person's allostatic load depends on many factors, including genetics, life experiences, and emotional and behavioral responses to stressors. The concept of allostatic load

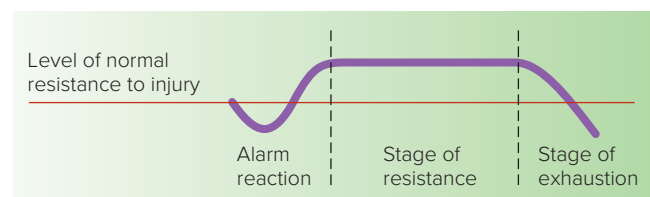
**general adaptation syndrome (GAS)** A pattern of stress responses consisting of three stages: alarm, resistance, and exhaustion.

**eustress** Stress resulting from a stressor perceived to be pleasant.

**distress** Stress resulting from a stressor perceived to be unpleasant.

**allostatic load** The "wear and tear" on the body that results from long-term exposure to repeated or chronic stress.

TERMS



**FIGURE 2.4** The general adaptation syndrome. During the alarm phase, the body's resistance to injury lowers. With continued stress, resistance to injury is enhanced. With prolonged exposure to repeated stressors, exhaustion sets in.

explains how frequent activation of the body's stress response, although essential for managing acute threats, can damage the body in the long run. For example, a student who suffers from test anxiety manages a week of exams but collapses on the weekend with a severe cold.

Although physical stress reactions may promote a new level of homeostasis (resistance stage of GAS), they also have negative effects on the body. The increased susceptibility to disease after repeated or prolonged stress may be due to effects of the stress response itself rather than to a depletion of resources (exhaustion stage of GAS). Over time, the student's allostatic load, along with susceptibility to disease, can increase. Allostatic load is generally measured through indicators of cumulative strain on several organs and tissues, especially on the cardiovascular system.

## Psychoneuroimmunology

One of the most fruitful areas of current research into the relationship between stress and disease is **psychoneuroimmunology (PNI)**. PNI is the study of the interactions among the nervous system, the endocrine system, and the immune system. The underlying premise of PNI is that stress, through the actions of the nervous and endocrine systems, impairs the immune system and thereby affects health.

A complex network of nerve and chemical connections exists among the nervous and the endocrine systems. In general, increased levels of cortisol are linked to a decreased number of immune system cells, or *lymphocytes*. Epinephrine appears to promote the release of lymphocytes but at the same time reduces their efficiency. Scientists have identified hormone-like substances called *neuropeptides* that appear to translate stressful emotions into biochemical events, some of which affect the immune system, providing a physical link between emotions and immune function.

Different types of stress may affect immunity in different ways. For instance, during **acute stress** (typically lasting between 5 and 100 minutes), white blood cells move into the skin, where they enhance the immune response. During a stressful event sequence, such as a personal trauma and the events that follow, however, there are typically no overall significant immune changes. Chronic (ongoing) stressors such as unemployment have negative effects on almost all functional measures of immunity. **Chronic stress** may cause prolonged secretion of cortisol (sometimes called the "antistress hormone" because it seeks to return the nervous system to homeostasis after a stress reaction) and may accelerate the course of diseases that involve inflammation, including multiple sclerosis, heart disease, type 2 diabetes, and clinical depression. In other words, this is one way that too many stress reactions over a prolonged length of time can have a negative impact on health.

Mood, personality, behavior, and immune functioning are intertwined. For example, people who are generally pessimistic may neglect the basics of health care, become passive when ill, and fail to engage in health-promoting behaviors. People who are depressed may reduce physical activity and

social interaction, which may in turn affect the immune system and the cognitive appraisal of a stressor. Optimism, successful coping, and positive problem solving, by contrast, may positively influence immunity.

**Cardiovascular Disease** During the stress response, heart rate increases and blood vessels constrict, causing blood pressure to rise. Chronic high blood pressure is a major cause of *atherosclerosis*, a disease in which blood vessels become damaged and caked with fatty deposits. These deposits can block arteries, causing heart attacks and strokes. The stress response can precipitate a heart attack in someone with atherosclerosis.

Certain emotional responses may increase a person's risk of CVD. As described earlier, people who tend to react to situations with anger and hostility are more likely to have heart attacks than are people with less explosive, more trusting personalities. Inflammation has been linked to stress and is a key component of the damage to blood vessels that leads to heart attacks (see Chapter 13 for more about CVD.)

**Psychological Disorders** Stress contributes to many psychological problems such as depression, panic attacks, anxiety, eating disorders, and posttraumatic stress disorder (PTSD). PTSD, which afflicts war veterans, rape victims, child abuse survivors, and others who have suffered or witnessed severe trauma, is characterized by nightmares, flashbacks, and a diminished capacity to experience or express emotion. (For information about psychological health, see Chapter 3.)

**Altered Immune Function** Some of the health problems linked to stress-related changes in immune function include vulnerability to colds and other infections, asthma and allergy attacks, and flare-ups of chronic sexually transmitted infections such as genital herpes and HIV infection.

**Headaches** More than 45 million Americans suffer from chronic, recurrent headaches. Headaches come in various types but are often grouped into the following three categories:

- **Tension headaches.** Approximately 90% of all headaches are tension headaches, characterized by a dull, steady pain, usually on both sides of the head. It may feel as though a band of pressure is tightening around the head, and the pain may extend to the neck and shoulders. Acute tension headaches may last from hours to days, whereas chronic tension headaches may occur almost every day for months or even

**psychoneuroimmunology (PNI)** The study of the interactions among the nervous, endocrine, and immune systems.

### TERMS

**acute stress** Stress immediately following a stressor; may last only minutes or may turn into chronic stress.

**chronic stress** Stress that continues for days, weeks, or longer.



years. Ineffective stress management skills, poor posture, and immobility are the leading causes of tension headaches. There is no cure, but the pain can sometimes be avoided and relieved with mindfulness skills (discussed later in the chapter), over-the-counter painkillers, and therapies such as massage, acupuncture, relaxation, hot or cold showers, and rest.

- **Migraine headaches.** Migraines typically progress through a series of stages lasting from several minutes to several days. They may produce a variety of symptoms, including throbbing pain that starts on one side of the head and may spread; heightened sensitivity to light; visual disturbances such as flashing lights or temporary blindness; nausea; dizziness; and fatigue. Women are more than twice as likely as men to suffer from migraines. Potential triggers include menstruation, stress, fatigue, atmospheric changes, bright light, specific sounds or odors, and certain foods. The frequency of attacks varies from a few in a lifetime to several per week. Treatment can help reduce the frequency, severity, and duration of migraines. Aerobic exercise is frequently recommended as a treatment for migraine headaches. However, the evidence for the efficacy of exercise to reduce the frequency



Ongoing stress has been shown to make people more vulnerable to everyday ailments, such as colds and allergies. ©Somos/Veer/Getty Images

## Ask Yourself

### QUESTIONS FOR CRITICAL THINKING AND REFLECTION

Have you ever been so stressed that you felt ill? If so, what were your symptoms? How did you handle them? Did the experience affect the way you reacted to other stressful events?

and severity of migraine headaches is mixed. There is mild evidence that exercise may reduce stress levels, a known trigger for migraine headaches. Researchers have not been able to replicate these findings consistently, however. Several studies have failed to show exercise as an effective treatment for migraine headaches. And for some people, exercise itself can trigger migraines.

- **Cluster headaches.** Cluster headaches are severe headaches that cause intense pain in and around one eye. They usually occur in clusters of one to three headaches each day over a period of weeks or months, alternating with periods of remission in which no headaches occur. More than twice as many men than women suffer from cluster headaches. There is no known cause or cure for cluster headaches, but a number of treatments are available. During cluster periods, it is important to refrain from smoking cigarettes and drinking alcohol because these activities can trigger attacks. For more information on treating headaches and when a headache may signal a serious illness.

**Other Health Problems** Many other health problems may be caused or worsened by excessive stress, including the following:

- Digestive problems such as stomachaches, diarrhea, constipation, irritable bowel syndrome, and ulcers
- Injuries, including on-the-job injuries caused by repetitive strain
- Menstrual irregularities, impotence, and pregnancy complications

## COMMON SOURCES OF STRESS

Recognizing potential sources of stress is an important step in successfully managing the stress in your life.

### Major Life Changes

Any major change in your life that requires adjustment and accommodation can be a source of stress. Early adulthood and the college years are associated with many significant changes, such as moving out of the family home. Even changes typically thought of as positive—graduation, job promotion, marriage—can be stressful.

Life changes that are traumatic, such as getting fired or divorced or experiencing the death of a loved one, may be

linked to subsequent health problems in some people. Personality and coping skills, however, are important moderating influences. People with strong support networks and stress-resistant personalities are less likely to become ill in response to life changes than are people with fewer resources.

## Daily Hassles

Although major life changes are stressful, they seldom occur regularly. Researchers have proposed that minor problems—life’s daily hassles, such as losing your keys or driving in traffic—can be an even greater source of stress because they occur much more often.

People who perceive hassles negatively are likely to experience a moderate stress response every time they face one. Over time, this can take a significant toll on health. Studies indicate that, for some people, daily hassles contribute to a general decrease in overall wellness.

## College Stressors

College is a time of major changes and minor hassles. For many students, college means being away from home and family for the first time. Nearly all students share stresses like the following:

- **Academic stress.** Exams, grades, and an endless workload await every college student but can be especially troublesome for students just out of high school.
- **Interpersonal stress.** Most students are more than just students; they are also friends, children, employees, spouses, parents, and so on. Managing relationships while juggling the rigors of college life can be daunting, especially if some friends or family members are less than supportive.
- **Time pressures.** Class schedules, assignments, and deadlines are an inescapable part of college life. But these time pressures can be compounded drastically for students who also have job or family responsibilities.
- **Financial concerns.** The majority of college students need financial aid not just to cover the cost of tuition but also to survive from day to day while in school. For many, college life isn’t possible without a job, and the pressure to stay afloat financially competes with academic and other stressors.
- **Worries about anything but especially about the future.** As college comes to an end, students face the next set of decisions. This decision making means thinking about a career, choosing a place to live, and leaving the friends and routines of school behind. Students may find it helpful to go to the campus career center, where they can talk to counselors and read guides for job seekers such as *What Color Is My*

### QUICK

### STATS

Of students who seek treatment at college and university counseling centers, **62% report anxiety, 49% report depression, and 45% report stress.**

—Center for Collegiate Mental Health, 2017

*Parachute?* by Richard N. Bolles, first published in 1970 and updated every year.

## Job-Related Stressors

According to the Stress in America survey, work was a close third in the highest-reported sources of stress for Americans in 2017. (The future of the nation was the top stressor; money was the second.) Tight schedules and overtime leave less time for exercising, socializing, and other stress-proofing activities. Worries about job performance, salary, job security, and interactions with others can contribute to stress. High levels of job stress are also common for people who are left out of important decisions relating to their jobs. When workers are given the opportunity to shape their job descriptions and responsibilities, job satisfaction goes up and stress levels go down.

If job-related (or college-related) stress is severe or chronic, the result can be *burnout*, a state of physical, mental, and emotional exhaustion. Burnout occurs most often in highly motivated and driven individuals who come to feel that their work is not recognized or that they are not accomplishing their goals. People in the helping professions—teachers, social workers, caregivers, police officers, and so on—are also prone to burnout. For some people who suffer from burnout, a vacation or leave of absence may be appropriate. For others, a reduced work schedule, better communication with superiors, or a change in job goals may be necessary. Improving time management skills can also help.

## Social Stressors

Social networks can be real or virtual. Both types can help improve your ability to deal with stress, but any social network can also become a stressor in itself.

**Real Social Networks** The college years can be a time of great change in interpersonal relationships—becoming part of a new community, meeting people from different backgrounds, leaving old relationships behind. You may feel stress as you meet people of other ethnic, racial, or socioeconomic groups. You may feel torn between sticking with people who share your background and connecting with those you have not encountered before. If English is not your first language, you may face the added burden of interacting in a language with which you are not completely comfortable. All these pressures can become significant sources of stress. (See the box “Diverse Populations, Discrimination, and Stress.”)

**Digital Social Networks** Technology can connect you with people all over the world and make many tasks easier, but it can also increase stress. Being electronically connected





## DIVERSITY MATTERS

### Diverse Populations, Discrimination, and Stress

Stress is universal, but an individual's response to stress can vary depending on gender, cultural background, prior experience, and genetic factors. In diverse multiethnic and multicultural nations such as the United States, some groups face special stressors and have higher-than-average rates of stress-related physical and emotional problems. These groups include racial and ethnic minorities, the poor, those with physical or mental disabilities, and those who don't express mainstream gender roles.

Discrimination occurs when people speak or act according to their prejudices—biased, negative beliefs or attitudes toward some group. A blatant example, rising to the level of hate

speech and criminal activity, is painting a swastika on a Jewish studies house or vandalizing a mosque. A more subtle example is when Middle Eastern American or African American students notice that residents in a mostly white college town tend to keep a close eye on them.

Immigrants to the United States have to learn to live in a new society. Doing so requires a balance between assimilating and changing to be like the majority, and maintaining a connection to their own culture, language, and religion. The process of acculturation is generally stressful, especially when the person's background is radically different from that of the people he or she is now living among, or when people in

the new community are suspicious or unwelcoming, as has recently been the case with immigrants from war-torn regions of the Middle East.

Both immigrants and minorities who have lived for generations in the United States can face job- and school-related stressors because of stereotypes and discrimination. They may make less money in comparable jobs with comparable levels of education and may find it more difficult to achieve leadership positions.

On a positive note, however, many who experience hardship, disability, or prejudice develop effective goal-directed coping skills and are successful at overcoming obstacles and managing the stress they face.

to work, family, and friends all the time can impinge on your personal space, waste time, and distract you.

The 2017 Stress in America survey looked at “constant checkers”—the 43% of Americans who report continually checking their emails, texts, or social media accounts. These constant checkers report higher levels of overall stress than do those who do not engage with technology as often. They are also more likely to report feeling disconnected from their family as a result of technology and to report being stressed by political and cultural discussions on social media.

## Other Stressors

Have you tried to eat at a restaurant where the food was great, but the atmosphere was so noisy that it put you on edge? This is an example of a minor environmental stressor—a condition or event in the physical environment that causes stress. Examples of more disturbing and disruptive, even catastrophic, environmental stressors include natural disasters, acts of violence, industrial accidents, and intrusive noises or smells. Like the noisy atmosphere of some restaurants, many environmental stressors are mere inconveniences that are easy to avoid. Others, such as pollen or construction noise, may be unavoidable daily sources of stress.

Many stressors are found not in our environment but within ourselves, and often are created by the ways we approach things. For example, striving to reach goals can enhance self-esteem if the goals are reasonable. Unrealistic expectations, however, can be a significant source of stress and can damage self-esteem. Other internal stressors are emotional states such as despair or hostility, and physical states, such as chronic illness and exhaustion.

## Ask Yourself

### QUESTIONS FOR CRITICAL THINKING AND REFLECTION

What are the top two or three stressors in your life right now? Are they new to your life—as part of your college experience—or have you experienced them in the past? Do they include both positive and negative experiences (eustress and distress)?

Traumatic stressors are extreme stressors that result from exposure to events that are life-threatening and can cause bodily injury. For college-age people, the most common traumatic stressors are automobile accidents, assaults, and rape. PTSD is not something you can handle on your own. If symptoms are severe or persist, you should contact a counselor to help you (see the box “Coping with News of Traumatic Events”).

## MANAGING STRESS

You can control most stress in your life by taking the following steps:

- Shore up your support system.
- Improve your communication skills.
- Develop healthy exercise and eating habits.
- Learn to identify and moderate individual stressors.
- Learn mindfulness skills.