Stanfield's

INTRODUCTION TO HEALTH PROFESSIONS

Seventh Edition

Nanna Cross
Dana C. McWay

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HEALTH PROFESSIONS

Seventh Edition

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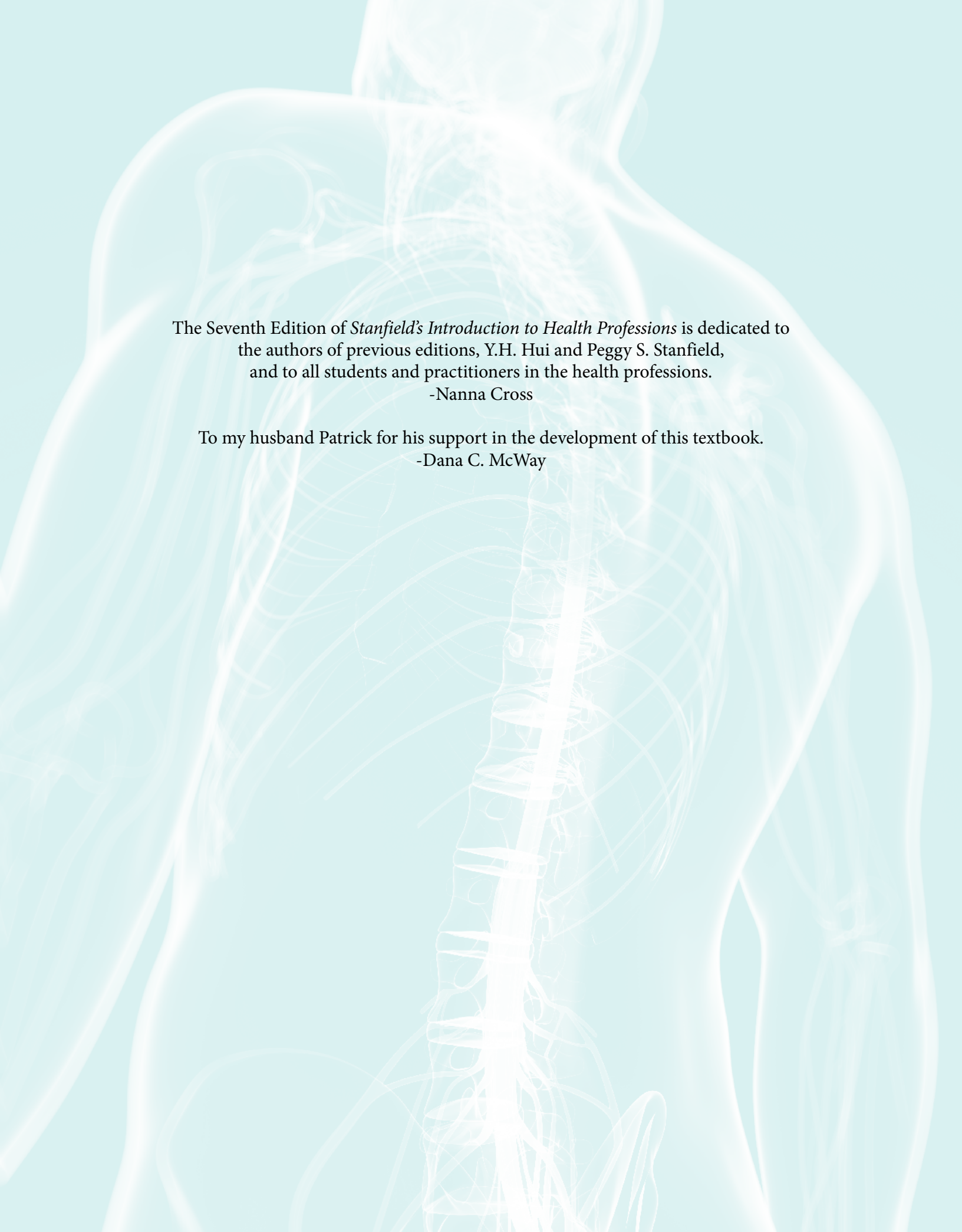

The Seventh Edition of *Stanfield's Introduction to Health Professions* is dedicated to the authors of previous editions, Y.H. Hui and Peggy S. Stanfield, and to all students and practitioners in the health professions.
-Nanna Cross

To my husband Patrick for his support in the development of this textbook.
-Dana C. McWay

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NOTE FROM THE AUTHORS

Careers in the healthcare field are growing more rapidly than other careers because of longevity and advanced technology that has increased the number of elderly needing health care. Within health care there is a career for nearly everyone—from entry-level positions as a home health aide that require no prior training to being employed as a physician that requires 7 to 8 years of college plus an internship to enter a career.

This text is designed so that the instructor can select individual chapters for a course. Most college texts are organized to be followed from the beginning of the book through the last chapter. By contrast, instructors using this text can select only certain chapters based on the course objectives since each chapter is written to be understandable and comprehensive as a standalone. Key terms unique to health care are defined in the glossary at the end of the text and are listed at the beginning of each chapter so students can refer to the glossary as needed.

WHAT ARE THE LATEST TRENDS IN THIS MARKET?

The trend is to require a master's degree or above for entry-level professional degrees such as occupational therapy and physical therapy, and an associate's degree for support personnel in the same field. Physical therapy and occupational therapy assistants trained at the associate's level are being used to support the work of professionals because of the lower cost for their services.

Information technology is changing the way health care is delivered as well as the way consumers manage their health. Electronic health records that are accessible by professionals regardless of physical location are cost effective and improve the quality and safety of health care. Many patients now have access to lab values and other text results through a patient portal within the electronic health record. Technology also makes it possible for patients to do more self-monitoring and to communicate results back to their physician, nurse, or caseworker. For example, blood glucose and blood pressure can be monitored by the patient and the results transmitted to the health care provider.

Nanna Cross, PhD, RDN, LDN
Dana C. McWay, JD, RHIA, FAHIMA

PREFACE

Now in full-color, the seventh edition of an *Introduction to Health Professions* provides comprehensive coverage of all the major health professions. This product is designed for students who are interested in pursuing a health-related career but are still exploring and have not yet decided on a specific career. The *Seventh Edition* outlines more than 75 careers and touches on every major facet of the field, including a description of the profession and typical work settings; educational, licensure, and certification requirements; salary and growth projections; and Internet resources on educational programs and state requirements for licensure and/or certification. In addition, this resource provides a thorough review of the U.S. healthcare delivery system, managed care, healthcare financing, reimbursement, insurance coverage, Medicare, Medicaid, and the impact of new technology on healthcare services. Information on career preparation and development are also included. All chapters are updated to reflect current demographics and new policies.

HOW IS THIS BOOK ORGANIZED?

The new edition of this text has been reorganized into five sections

- **Part I—The Healthcare System in the United States**. This section provides an overview of the healthcare system in the United States, with separate chapters on categories of health services, financing health care, the impact of aging on demands for healthcare providers, health care reform, and medical and information technology.
- **NEW! Part II—Jobs and Careers**. This section focuses on career planning and career development.
- **NEW! Parts III through V** contain chapters on individual careers that are organized so that students will be able to quickly identify a particular career of interest. Each chapter is organized to follow the same general format, making it easy for students to explore many different health careers. Each chapter follows the same format with a description of the profession and typical work setting; educational, licensure and certification requirements; salary and growth projections; and Internet resources on educational programs and requirements for licensure and/or certification. For example, in the chapter on dentistry, the career is described based on the education and training requirements from most education—dentist—to least education—dental assistant. For each career within the dentistry profession, the student has access to the usual responsibilities, work setting, salary, and expected demand for that career. Each chapter lists Internet resources to explore educational programs as well as state requirements for licensure and certification options for advancing in the profession.
- **Part III—Healthcare Practitioners and Technicians.** This section is the core of the product and contains 20 chapters directed at health careers that involve direct patient contact and care, ranging from diagnosis to treatment to education and counseling and medical or surgical interventions.
- **Part IV—Healthcare Support Personnel.** This section contains five chapters directed at health careers that support or supplement other health professionals in providing ongoing care for patients—medical and nursing assistants, personal, home, and psychiatric aides; medical information technology; and massage and recreation therapy.
- **Part V—Health-Related Professions.** This section focuses on health-related professionals who usually do not have direct contact with human patients but often have an impact on human health—veterinary medicine and occupational health and environmental sciences.

ABOUT THE AUTHORS

Nanna Cross, PhD, RDN, LDN has worked as a faculty member in dietetic and physician education programs teaching clinical nutrition courses and supervising dietetic interns in clinical practicums. Dr. Cross worked as a clinical dietitian at the University of Missouri Hospitals and Clinics and as a consulting dietitian for Home Care, Hospice, Head Start and Long-Term Care facilities.

Dana C. McWay, JD, RHIA, FAHIMA is both a lawyer and a health information management professional. She works as an adjunct faculty member at Saint Louis University in the Health Informatics and Pre Law Studies programs. She serves as the Clerk of Court for the U.S. Bankruptcy Court for the Eastern District of Missouri, an executive position responsible for all operational, administrative, financial, and technological matters of the court. She has worked as both a director and assistant director of medical records in a large teaching hospital and a for-profit psychiatric and substance abuse facility. She is a past Director on the Board of Directors of the American Health Information Management Association and serves as a voting member of the Institutional Review Board at Washington University School of Medicine, from 1992 to present.

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NEW FEATURES

Professional Profiles

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Name: Amanda, RN, ADN
Job Title: Charge Nurse
Education: Associates in Nursing; enrolled for BSN

Q: Tell us about your career progression.

A: After graduating from nursing school, I hired on at a local hospital with 113 beds and soon after found myself a charge nurse on a 31-bed high acuity telemetry unit. Diagnoses of our patients varied from congestive heart failure, myocardial infarction, cardiomyopathy, and many chest pain rule outs that resulted in other various outcomes.

I recently took a position on a 40-bed medical floor as a free charge nurse. My job now allows me to focus on the hospital's quality indicators and outcomes. I get to round on patients in the morning to determine the needs of my colleagues and the floor. I love the role I am currently in because I can advocate for patients by discussing the care they are receiving and learning ways to improve our delivery.

Q: What challenges you about your profession?

A: Nursing has been a very challenging yet fulfilling career for me. It has allowed me to develop a professional skill set, build relationships with patients, and learn on a daily basis from my peers. I have recently become engaged in community events while sitting on the Young Professional Advisory Board in my county. I have had many great opportunities while working as a registered nurse and look forward to many to come.

Q: How have you demonstrated professionalism in your career?

A: Over the years, my career has presented me with many opportunities to grow as a professional. The hospital has a clinical development program that allows nurses to put together a portfolio representing their work over time. There are many requirements including service in the community, continuing education, awards or recognition from patients, and participation in committees or improvement events that take place in the hospital. Developing this portfolio and committing to the work that it entails encourages me to view my job as a nurse as something much more. Nursing is a profession and has been elevated to that over time. As a nurse, I feel it's my obligation to continue to engage myself into my community and help represent what the profession of nursing is.

Q: Without disclosing protected health information, describe an ethical challenge you've faced and how have you addressed it.

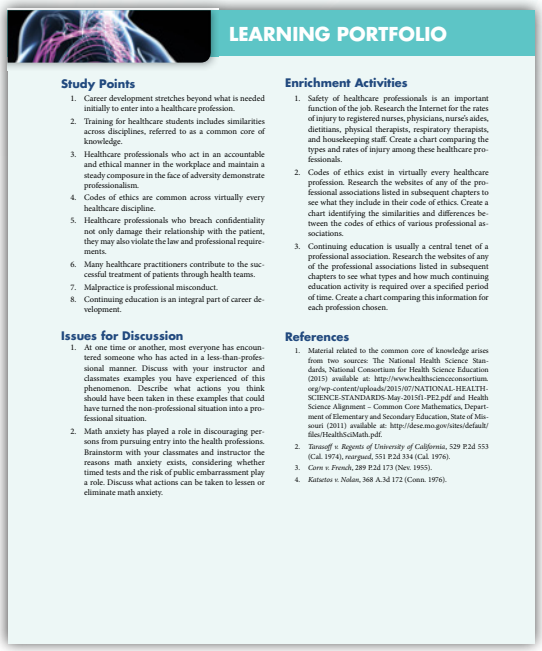
A: As a nurse I often am witness to ethical dilemmas within the acute care setting. When taking care of an elderly patient who had decided to go on hospice, I witnessed many family members who came in to visit who were not in agreement with the patient's decision. Over the course of a few days the patient had become very weak and unable to communicate. Many family members began to demand that the decision to start hospice care be reversed and that [hospital staff] resume treatment for the patient's cancer. When involved in caring for large families and patients with terminal illness, it is important to advocate for the patient. At times, it can be emotionally taxing, and your own beliefs may not agree with those of the patient; however, it's important to keep your own beliefs out of it. Ultimately, in this particular situation, my patient had paperwork that reflected his wants and needs for end-of-life care. He had made a decision to die peacefully, and my job was to allow him just that. We called a chaplain in to comfort the family and help them understand that the patient was clear about his wishes. In this case, the family just needed support to accept his wishes. Death is hard for all parties involved, but as a nurse, my first priority was advocacy for my patient.

Q: Describe the continuing education requirements for your profession.

A: Continuing education is mandated each year and can be different from unit to unit. My floor must participate in a skills lab that ensures that we are proficient in a number of clinical skills. We must also obtain eight hours of continuing education hours that we can do online or take classes within the hospital. Throughout the hospital, there are multiple types of equipment to safely transfer patients who need assistance with ambulation, so every year we have to demonstrate proficiency in safe patient handling. It is also mandatory to keep up to date a BLS [basic life support] card and in some areas ACLS [advanced cardiac life support].

Interviews with Professionals

Including Frequently Asked Question/Answer section.



LEARNING PORTFOLIO

Study Points

1. Career development stretches beyond what is needed initially to enter into a healthcare profession.
2. Training for healthcare students includes similarities across disciplines, referred to as a common core of knowledge.
3. Healthcare professionals who act in an accountable and ethical manner in the workplace and maintain a steady composure in the face of adversity demonstrate professionalism.
4. Codes of ethics are common across virtually every healthcare discipline.
5. Healthcare professionals who breach confidentiality not only damage their relationship with the patient, they may also violate the law and professional requirements.
6. Many healthcare practitioners contribute to the successful treatment of patients through health teams.
7. Malpractice is professional misconduct.
8. Continuing education is an integral part of career development.

Issues for Discussion

1. At one time or another, most everyone has encountered someone who has acted in a less-than-professional manner. Discuss with your instructor and classmates examples you have experienced of this phenomenon. Describe what actions you think should have been taken in these examples that could have turned the non-professional situation into a professional situation.
2. Math anxiety has played a role in discouraging persons from pursuing entry into the health professions. Brainstorm with your classmates and instructor the reasons math anxiety exists, considering whether timed tests and the risk of public embarrassment play a role. Discuss what actions can be taken to lessen or eliminate math anxiety.

Enrichment Activities

1. Safety of healthcare professionals is an important function of the job. Research the Internet for the rates of injury to registered nurses, physicians, nurse's aides, dietitians, physical therapists, respiratory therapists, and housekeeping staff. Create a chart comparing the types and rates of injury among these healthcare professionals.
2. Codes of ethics exist in virtually every healthcare profession. Research the websites of any of the professional associations listed in subsequent chapters to see what they include in their code of ethics. Create a chart identifying the similarities and differences between the codes of ethics of various professional associations.
3. Continuing education is usually a central tenet of a professional association. Research the websites of any of the professional associations listed in subsequent chapters to see what types and how much continuing education activity is required over a specified period of time. Create a chart comparing this information for each profession chosen.

References

1. Material related to the common core of knowledge arises from two sources: The National Health Science Standards, National Consortium for Health Science Education (2015) available at: http://www.healthscienceconsortium.org/wp-content/uploads/2015/07/NATIONAL-HEALTH-SCIENCE-STANDARDS-May-20151-PF2.pdf and Health Science Alignment – Common Core Mathematics, Department of Elementary and Secondary Education, State of Missouri (2011) available at: http://dese.mo.gov/sites/default/files/HealthSciMath.pdf.
2. *Tarasoff v. Regents of University of California*, 529 P.2d 553 (Cal. 1974), *reargued*, 551 P.2d 334 (Cal. 1976).
3. *Corn v. French*, 289 P.2d 173 (Nev. 1955).
4. *Katsetos v. Nolan*, 368 A.3d 172 (Conn. 1976).

Learning Portfolio

At the end of each chapter, this review section includes: Study Points, Issues for Discussion, and Enrichment Activities.

All sections are thoroughly updated to reflect current training requirements, responsibilities, and salaries, as established in the *Occupational Outlook Handbook 2016-2017 Edition.*

New Careers

Includes nine new careers!

- Podiatrist (Chapter 9)
- Orthotics and Prosthetics (Chapter 17)
- Exercise Physiologist (Chapter 19)
- Substance Abuse and Behavioral Disorders Counselor (Chapter 20)
- Genetic Counselor (Chapter 22)
- Community Health Worker (Chapter 23)
- Board-Certified Behavior Analyst (Chapter 23)
- Phlebotomist (Chapter 29)
- Massage Therapist (Chapter 30)

THE LEARNING AND TEACHING PACKAGE

The Learning Package for the Student

Students can review the Learning Portfolios at the end of each chapter. For the first eight chapters of the text, the Learning Portfolio includes Study Points, a brief summary of the chapter content. All chapters also include Issues for Discussion and Enrichment Activities designed to be used by the student for self-study and exploration.

The Teaching Package for the Instructor

Teacher resources include the Learning Portfolios at the end of each chapter, which are designed to be used by both the student and instructor. In addition, the following items are part of the Instructor's Teaching Package:

- Test Bank for each chapter
- PowerPoint slides for each chapter
- Instructor's Manual with the following components:
  - Chapter Overview
  - Lesson Objectives
  - Resources
  - Suggested Lecture Outline
  - Discussion Questions
  - Suggested Learning Activities
  - Homework

Bloom's Taxonomy

The Learning Package for the student and the Teaching Package for the instructor are designed to incorporate Bloom's levels of learning from the lowest level of knowledge to the highest level of evaluation. The learning and teaching packages that accompany the text encourage going beyond the content of the text. The text is expected to be a starting point.

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PART ONE

The Healthcare System in the United States

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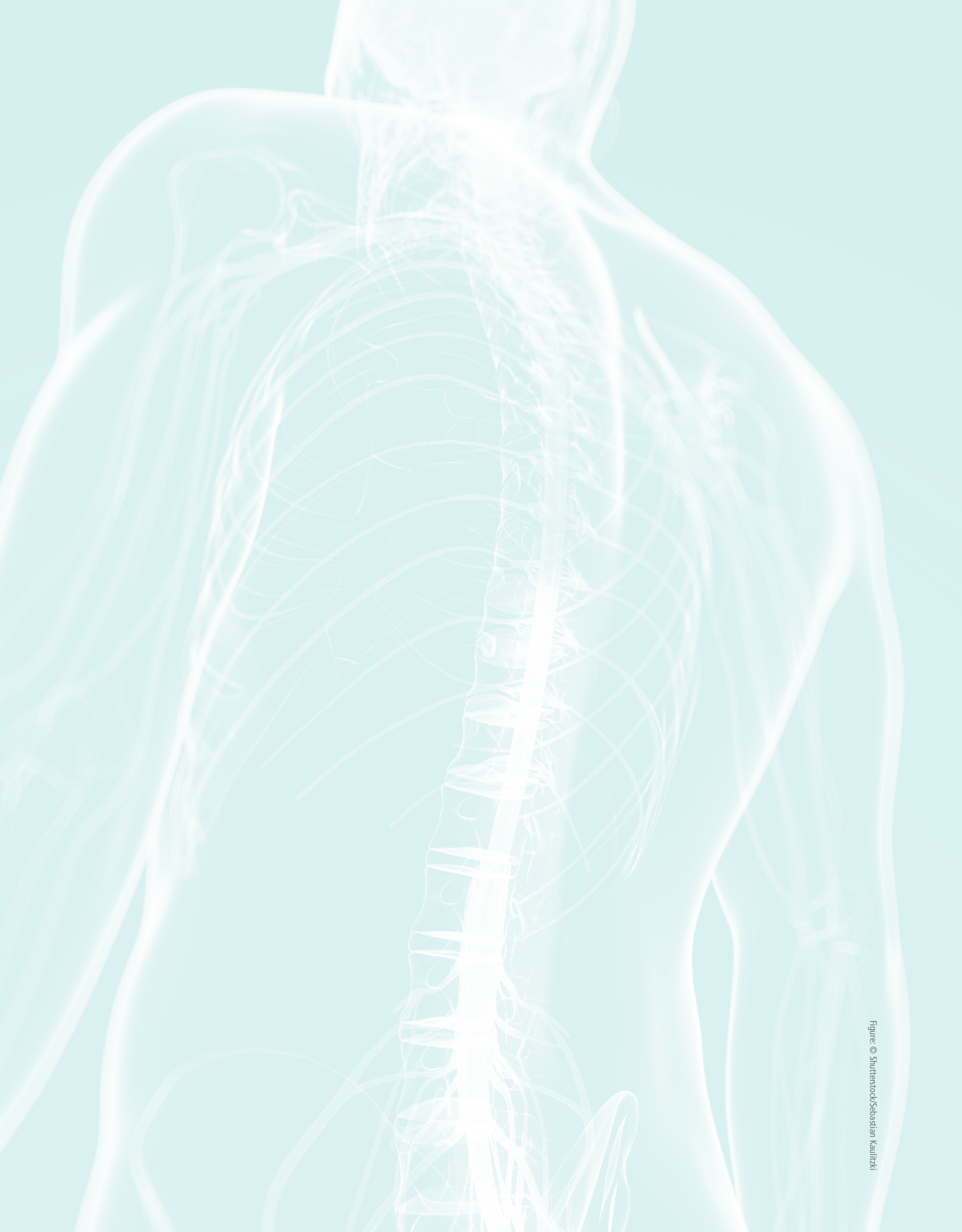

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CHAPTER 1

U.S. Health Care

Objectives

After studying this chapter, the student should be able to:

- Discuss the changes in health problems of the population in the United States over the past 150 years.
- Identify expected future changes in the health of the population that will influence healthcare needs and career opportunities in health care.
- Explain the role of the government in the expansion of health care.

Key Terms

Acute infectious diseases
Affordable Care Act (ACA)
Applied behavior analysis (ABA)
Autism spectrum disorder (ASD)
Avian influenza
Centers for Disease Control and Prevention (CDC)
Chronic illness
Children's Health Insurance Program (CHIP)
Clinical preventive services
Ebola virus
Electronic health records (EHRs)
Epidemics
Globalization
Health Exchange
Health information technology (health IT)
Health outcomes
Human Genome Project
Infant mortality
Infectious disease
Life expectancy
Lifestyle
Longevity
Medicaid
Medical technology
Methicillin-resistant *Staphylococcus aureus* (MRSA)
National Prevention Council
Sepsis
World Health Organization (WHO)

Introduction

This *Seventh Edition* differs from the first six editions for two reasons. First, three new chapters have been added: Chapter 6: Medical and Health Information Technology, Chapter 8: Career Development, and Chapter 22: Genetic Counseling. Second, discussion questions and enrichment activities have been added to each chapter. The impact of healthcare reform legislation on healthcare delivery systems and careers has been incorporated into this edition.

HISTORICAL EVENTS IMPACTING HEALTH CARE

Controlling healthcare costs and increasing access to health care were policy priorities for President Barack Obama with the passage of the **Affordable Care Act (ACA)** signed into law on March 23, 2010.[1] Some of the reasons for the rising costs of health care are the use of expensive **medical technology** and prescription drugs, reimbursement systems that reward the volume of medical services instead of outcomes, inadequate preventive services, the aging of the population, and the increased prevalence of chronic disease, as well as high administrative costs.[2] Healthcare costs have been a concern of the government because growth in healthcare costs exceeded growth of the United States economy beginning in the 1970s and 1980s at a high of 10% to 12% with a drop between 2010 and 2012, when healthcare spending was comparable to growth of the economy at 3%.[3] Another critical issue that needs to be addressed is the inefficiencies and disparities in the current system. Comparisons with other countries and across states show large variations in spending without commensurate differences in **health outcomes**.[4]

The most significant change in health care in the United States in the past five years is the number of individuals who have access to health care with the implementation of the ACA. At the end of 2014, 15.6 million people had health insurance through either a private health insurance carrier or a **Health Exchange**. Total enrollment through a Health Exchange totaled 6.7 million in 2014 and 11.7 million in 2015.[5] Also, between the summer of 2013 and January 2015, there was a 19% increase in the number enrolled in either **Medicaid** or the **Children's Health Insurance Program (CHIP)** for a total of 11 million additional low-income children and adults with access to health care.[6] Even with greater access to health insurance—an estimated 30 million people continue to be uninsured—the majority of the uninsured are low income with poor health who live in states that opted out of Medicaid expansion under the ACA.[7] Greater access to health care increased demand for providers (physicians, nurses and other healthcare workers), hospitals, outpatient clinics and home-care services. The healthcare environment has become more competitive, in large part because of the requirements for hospitals to improve both the quality of care and efficiency as a result of the ACA.

The United States will need to continue to improve the efficiency and quality of health care and reduce disparities in access to health care for all Americans. With that premise, we begin this chapter with a look back at healthcare issues and treatments developed in the past 150 years. Much of the material from the sixth edition of this text is still relevant. The succeeding chapters have been updated to reflect the anticipated changes and demographics of the 21st century, and the changing nature of health care and opportunities for health careers.

A LOOK BACK

Since the dawn of recorded history (and undoubtedly before), human beings have suffered sudden and devastating **epidemics** and diseases. In the United States in the second half of the 19th century, the most critical health problems were related to contaminated food and water and inadequate housing, and sewage disposal. A countrywide cholera epidemic and a yellow fever epidemic killed more than 30,000 people between 1853 and 1858.

By 1900, **infectious disease** epidemics had been brought under control as a result of improving environmental conditions. Cities developed systems for safeguarding the milk, food, and water supply, and health departments began to grow, applying case findings and quarantines with good results. The major epidemics that had caused deaths had been eliminated in the United States, and the pendulum swung away from **acute infectious diseases** and toward chronic conditions.

Pneumonia, tuberculosis, diarrhea, and diphtheria accounted for one-third of all deaths in the 1900s. The most important factor in the decline in mortality in the 20th century was essential hygiene, supported by home and workplace improvements and attempts to improve the environment. Better hygiene accounted for approximately one-fifth of the reduction in mortality.[8]

Another reason for the falling death rate was the improvement of nutrition, which led to an increase in the resistance to diseases. Once sanitation improved, lack of food and the resulting malnutrition were largely responsible for infectious diseases. Nutritional status is a critical factor in a person's response to infectious diseases, especially young children. According to the **World Health Organization (WHO)**, the best "vaccine" against common diseases is an adequate diet.

With epidemics behind them, the scientific community began working on better surgical techniques, new treatment

FIGURE 1.1 Universal child immunization beginning in the 1950s dramatically reduced death from infectious disease in the United States.
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methods, new tests to facilitate accurate diagnoses, and the treatment of individual diseases. The number of hospitals grew rapidly, and medical schools flourished. Within a few years, medical care and patterns of disease had totally changed. The arrival of antibiotics in the 1940s and the implementation of childhood universal vaccination in the 1950s for measles, mumps, rubella, and polio signaled the end of the dominance of acute infectious disease (**FIGURE 1.1**).[8]

By the late 1940s, **chronic illnesses** such as heart disease and cancer accounted for nearly half of the deaths in the United States. By the 21st century, the development of new drugs to control risk factors for heart disease, for example, drugs to control hypertension, cholesterol, and diabetes, reduced death from heart disease by 28% between 2003 and 2013. During this same time, deaths from cancer also decreased by 15% (**FIGURE 1.2**).[9]

The introduction of antiviral therapy in the 1990s reduced the death rate from the human immunodeficiency virus (HIV) by 80%.[10]

The effectiveness of new treatments, including drug therapy, increased **life expectancy** over a 30-year period between 1980 and 2013; life expectancy increased from 70 to 76.4 years in men and from 77.4 to 81.2 years in women (**FIGURE 1.3**).

Infant mortality rates fell to a historically low level of 5.96 per 1,000 births, a 13% decline between 2003 and 2013.[9]

Longevity and an increased number of elderly have increased the prevalence of chronic and degenerative diseases associated with aging, including hypertension, diabetes, chronic kidney disease, and osteoporosis, as well as Alzheimer's disease and other forms of dementia.[11] The downside to improved health care and longevity is that one-third of the population above 65 has multiple chronic conditions. Treatment for chronic conditions in the elderly accounts for two-thirds of total healthcare costs in the United States. In the future, physical and cognitive decline associated with aging will require personal assistance from family or paid caregivers and health services from a variety of health professionals. In addition, by 2050 the population will also be more ethnically and racially diverse: one-third will be Hispanic non-white, one-third African American, and one-third white.[11] These changes will influence the environment for new healthcare workers and the diversity of those needing care.

A LOOK FORWARD

Medicine must now confront the diseases and health problems that are greatly influenced by the local and international environment. **Globalization** and ease in international travel increase the risk for infectious diseases. In the United States, viral gastroenteritis is the most common viral infection and salmonellosis is the most common bacterial infection—both

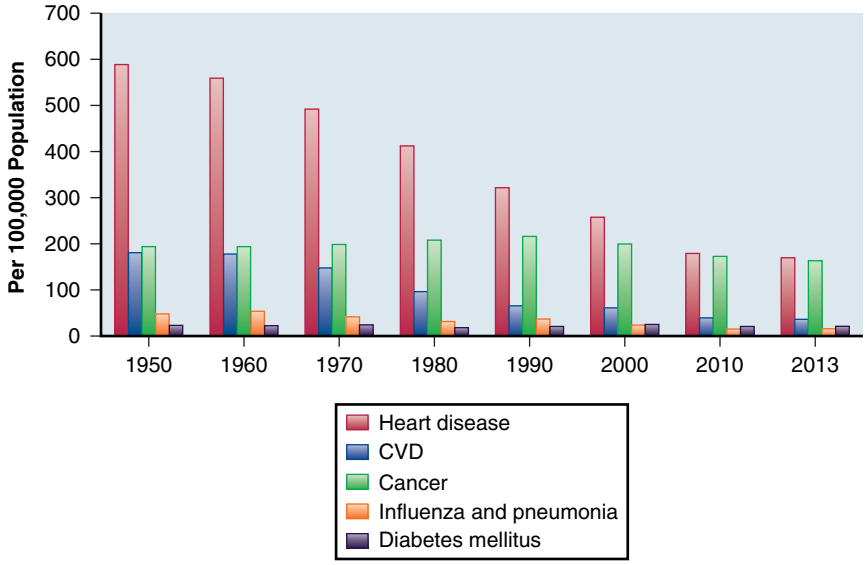

FIGURE 1.2 Death rate for selected causes.
Data from National Center for Health Statistics.

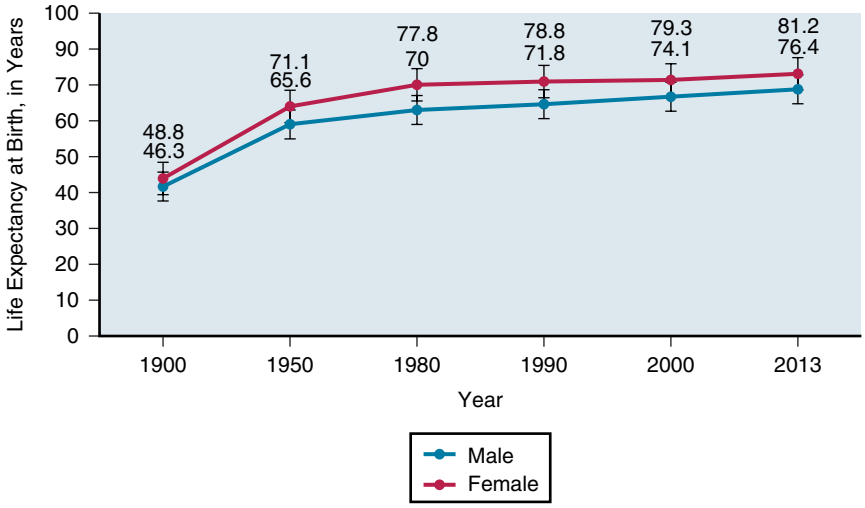

FIGURE 1.3 Life expectancy by year and sex.
Data from National Center for Health Statistics. Health United States, 2014: With Special Features on Aged 55–64.Hyattsville, MD. 2015.

organisms cause foodborne illness.[12] Newly recognized infectious agents have caused substantial public health concern and investment. These include influenza H3N2, **avian (bird) influenza**, and **Ebola**, and some particularly virulent or drug-resistant bacterial strains, such as **methicillin-resistant *Staphylococcus aureus* (MRSA)**. Influenza and pneumonia remain major causes of death, particularly among persons 65 years of age and older, and HIV/AIDS continues to spread.

Although most infectious diseases are now prevented with vaccines and improved methods of infection control, new organisms continue to appear from mutations and transmission from wild animals or insects to domesticated animals and sometimes to humans. For example, in 2015 cases of avian flu were identified in Europe and China; in the United States, entire commercial poultry flocks required culling or removal of infected turkeys and chickens—and sometimes an entire flock was destroyed to prevent further spread of the disease, at great financial cost to the poultry business.[13]

The 2014 Ebola epidemic in West Africa, the largest in history, spread to the United States by healthcare workers employed in West Africa. The **Centers for Disease Control and Prevention (CDC),** the U.S. government agency that monitors infectious diseases, developed infection-control measures for hospitals treating infected patients in the United States. WHO and the CDC also deployed teams of experts to West Africa to implement infection-control measures to prevent further spread of the disease in Africa.[14]

MSRA increases the risk for surgical infections, pneumonia, and **sepsis** in hospitalized patients and requires stringent infection control measures to prevent spread of the bacteria causing the infection from patient to patient and among healthcare workers (**FIGURE 1.4**).[15]

Epidemics of infectious disease require a team of experts to track and contain diseases to prevent epidemics in both humans and animals. Physicians, nurses, veterinarians, medical laboratory technologists, epidemiologists, and public health officials at the local, state, and federal level are examples of healthcare workers involved in preventing the spread of infectious disease.

FIGURE 1.4 Methicillin-resistant *Staphylococcus aureus* (MRSA) is a common cause of skin infection.
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Most diseases of today are associated with personal **lifestyle**. Individuals can take responsibility for most lifestyle factors such as physical activity, eating habits, smoking, drinking alcoholic beverages, using illicit drugs, personal hygiene, and so forth. However, healthy communities are necessary to support individuals in achieving a healthy lifestyle. Disparities in health are related to lack of access to healthy food, safe housing, space for regular physical activity, education, employment, and health care. The **National Prevention Council** established seven priorities for preventive services to improve the health and quality of life for all Americans of all ages and to address health disparities (**TABLE 1.1**).[16]

Two lifestyle factors associated with a high risk for heart disease and cancer that can be changed are smoking

TABLE 1.1 National Prevention Strategy Priorities for Reducing Death and Major Illness

Tobacco-free living
Preventing drug abuse and excessive alcohol use
Healthy eating
Active living
Preventing injury and violence
Reproductive and sexual health
Mental and emotional well-being

Data from National Prevention Council. *National Prevention Strategy*. June 2011. Internet: http://www.surgeongeneral.gov/priorities/prevention/index.html

and obesity.[17] The good news is that the rate of smoking has dropped by more than half since 1970, when 45% of adults over 18 years of age smoked compared to only 18% in 2013. However, obesity rates continue to rise—only 30% of adults 20 years of age and older were at a healthy weight between 2009 and 2012.[9]

For the future, the predominance of chronic illness as the major threat to health raises many issues. The public concept of health is that intervention by the doctor and early discovery of disease will prevent or cure disease, when in fact health is determined mainly by lifestyle. Optimal treatment for preventing chronic illness requires health care that is long-term and continuous, yet health care in the United States is often delayed until a chronic disease has been diagnosed. Although behavioral and environmental influences are the greatest contributors to poor health, surgery and drugs are regarded as the core of health care. The current method of financing health services emphasizes payment for specialized services—for example, surgery or cardiac rehabilitation—instead of preventive care, which may include referral to a dietitian for nutrition counseling to lower weight and blood cholesterol levels. Funding for health care has traditionally focused on treatment of chronic disease, such as hemodialysis treatment for chronic kidney disease—often the result of untreated or poorly controlled hypertension or diabetes. What is needed in health care is a redistribution of resources for the prevention of disease, care of the acutely ill who require immediate treatment, and ongoing care for those with chronic diseases.

Preventive healthcare services improve health by protecting against disease, lessening the impact of disease, or detecting disease at an early stage when it is easier to treat. As a result of requirements to include preventive services by insurance plans purchased through Health Exchanges under the ACA and coverage by Medicare, **clinical preventive services** are being utilized by more Americans. For example, immunizations and cancer screening—e.g., mammography and colonoscopy—are the most common preventive services. However, utilization remains suboptimal for some services. In 2013, only 70% of children 19 to 35 months of age received a combined vaccination series protecting them against nine infectious diseases. Only 41% of adults 18 years and older received the influenza vaccine, and only 60% of adults over 65 years of age received a vaccine against pneumonia.[9]

IMPACT OF TECHNOLOGY ON HEALTHCARE SERVICES

Technology has made many new procedures and methods of diagnosis and treatment possible. Advances in medical technology have improved the survival rates of trauma victims and the severely ill. Clinical developments, such as infection control, less-invasive surgical techniques, and advances in reproductive technology, improve the quality of life. Drug therapy for managing chronic conditions—cancer, heart disease, and diabetes—has extended life for many Americans. Prescription drugs for treating mental illness have allowed many to live in the community instead of being hospitalized.[10] Between 2007 and 2010, nearly half of all Americans took one or more prescription drugs. Factors that have contributed to greater use of prescription drugs are the growth of drug coverage by private and government health insurance—Medicare Part D (drug plans) was introduced in 2006—and the ACA of 2010 made drugs more affordable.[10]

The continuing surge of technological advances is not without problems. Medical technology can also prolong life for the critically ill, unresponsive patient who has little or no chance of recovery. Services such as mechanical ventilation, kidney dialysis, parenteral (tube) feeding, and other means can keep even comatose patients alive. For the healthcare system, dying can be extremely expensive.

The high cost of technology affects the financial structure of the entire healthcare system. These increased costs are visible in the form of higher health insurance costs, higher costs for hospital stays, government payments to the system, and total medical bills. This advanced technology has not only increased medical costs, but also created a social and ethical problem. Because of limits in funding, advanced treatment is not available to all people. The poor, who may need it desperately, have no access to it.

The incredible growth of technology has affected all the health professions. Students entering the health field today recognize that they must excel academically and master technical skills. Less time is spent learning personal, nontechnical aspects of care. This value system is reinforced by professionals, peers, and administrators, and by the public as well. Excellent technical performance has become a standard, at the cost of the personal, human touch.

The federal government plays an increasingly powerful role in the direction of health care. It dominates the healthcare system by virtue of its expanding monetary support of technology and services, and because it sets the rules for the provision of health care.

As health services enter the 21st century, it becomes apparent that the social philosophy of the 20th century is

obsolete and is moving toward a philosophy that holds society, through the government, responsible for organizing and maintaining adequate health care for all people. Health care was once considered an individual matter, but it is now considered a right to which everyone should have access.

TRENDS THAT WILL IMPACT HEALTH SERVICES AND HEALTH CAREERS

Changes in disease patterns and methods of diagnosis and treatment impact the demand for health services and healthcare workers. The **Human Genome Project** has identified gene mutations that transmit risk for disease and response to drugs used to treat disease. The lower cost of genetic testing and coverage by health insurance have made it possible for this technology to be available for more people. This new information allows a physician to ask patients for a family disease history and order DNA testing to target preventive measures specific to the disease. Genetic counselors play an important role in counseling patients about DNA testing to identify risk for disease as well as treatment interventions.[18]

Public health research shows that more and more children are being diagnosed with **Autism spectrum disorders (ASD)** with 1 in 68 children in the U.S. being given this diagnosis. Children with ASD are often treated by a team of health professionals, including occupational therapists, speech therapists, and **applied behavior analysis (ABA)** therapists (FIGURE 1.5).[19]

Many diseases of the brain cause disabilities that impact productivity and quality of life and contribute to high healthcare costs. New technology makes it possible to identify genes for these brain diseases—Alzheimer's, Parkinson's disease, epilepsy, ASD, traumatic brain injury, and psychiatric disorders such as schizophrenia and depression—as well as capture images of the brain to develop treatment for such diseases.[20] Awareness of the need for pain control and freedom to make choices about treatment for those with life-limiting illnesses is beginning to shift the focus of both patients and physicians from curative therapy to quality of life and greater use of palliative and hospice services.[21]

Health information technology (health IT) is changing the way healthcare workers practice their profession, and even more changes are expected in the future. First steps were using **Electronic health records (EHRs)** in hospitals that linked data from physicians, pharmacy, clinical laboratories, and imaging as well as documentation by all health professions. EHRs make it possible for multiple team members to schedule a patient-team conference regardless of physical location. Remote monitoring of patient clinical data—for example, blood pressure and blood glucose—allows healthcare workers to provide care after the patient is discharged from the hospital. Sharing of EHRs among different providers for the same patient—hospital, emergency room and outpatient clinic—has the potential for improving patient safety by avoiding drug interactions and reducing costs by avoiding duplicate laboratory tests.[22] The federal government uses data to monitor outcomes such as hospital readmission rates and surgical complications, as well as healthcare costs.

FIGURE 1.5 Autism spectrum disorders (ASD) affects 1 in 68 children in the United States.
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SUMMARY

To improve the health of all Americans, it is critical to continue collecting data on all components of health; documenting trends in risk factors, health status, and access to and utilization of healthcare services; and disseminating reliable and accurate information about the health of our population. Equally important is gaining an understanding of the healthcare needs and utilization patterns of population subgroups, especially with changes in access to health care with healthcare reform. Such insights will enable policy makers to set program priorities and allocate target resources most effectively. Healthcare and population trends and healthcare reform will affect all health professionals in every career and will change the practice of medicine as we know it.

Because there is no single "U.S. healthcare system," the many ways in which health care is delivered can be puzzling. This should not be surprising, given the historical perspective of health services, the diverse subsystems in operation in the United States, and the dynamics of social and technological changes.

LEARNING PORTFOLIO

Study Points

1. As a result of the 2010 Affordable Care Act (ACA), more Americans had access to health insurance through Health Exchanges, Medicaid, or the Children's Health Insurance Program (CHIP). As a result of new Health Exchanges, 6.7 million Americans obtained health insurance in 2014 and 11.7 million were enrolled in 2015. An additional 11 million low-income adults and children received health care through Medicaid or CHIP in 2015.
2. Health problems during the 1800s were related to contaminated food and water and inadequate sewage disposal resulting in epidemics and deaths from cholera and yellow fever.
3. Both longevity and infant mortality statistics improved with improvement in sanitation and universal immunization; by 1950, the principal causes of death changed from infectious diseases to the chronic diseases of heart disease and cancer.
4. By the 21st century, the decrease in death rates among the elderly was significant. These declines were related to improved drug treatment for heart disease and cancer and lower smoking rates.
5. The consequence of improved longevity is a greater number of elderly with multiple chronic and degenerative diseases; treatment for these conditions account for two-thirds of total healthcare costs in the United States.
6. Clinical preventive services (cancer screening and immunizations) are more accessible because of provisions of the Affordable Care Act, but not all Americans take advantage of these services.
7. New infectious diseases of domesticated animals and humans continue to emerge and require monitoring and infection-control measures to prevent epidemics.
8. Over 50% of the causes of death are related to personal lifestyle choices: diet, physical activity, tobacco and alcohol use, illicit use of drugs, and motor vehicle traffic fatalities.
9. Greater use of prescription drugs are the result of drug coverage by private and government health insurance—Medicaid, CHIP, Medicare, and the ACA.
10. The Human Genome Project will increase understanding of diseases of the brain needed to develop improved methods of diagnosis and treatment.
11. Health information technology (health IT) improves communication and efficiency in providing health care and will increasingly be used by the government to monitor the quality and cost of healthcare delivery.
12. Factors that will influence current and future healthcare occupations are changes in disease patterns and treatment and access to health care.

Issues for Discussion

1. Discuss changes in access to health care in the United States as a result of the Affordable Care Act of 2010.
2. Discuss how the causes of death have changed since 1900 in the United States. Discuss three major factors that have contributed to this change.
3. Discuss the role of government in providing access to health care through legislation and financial support of health care and technology.
4. Discuss the pros and cons of requiring all children to receive immunizations as a prerequisite to enrolling in school.
5. Discuss the role of Health information technology (health IT) in monitoring the quality and cost of health care in the United States. What are the advantages and disadvantages of using HIT?

Enrichment Activities

1. Methicillin-resistant *Staphylococcus aureus* (MRSA) is a cause of skin infection in the community, for example in high schools and day care centers. Review information from the CDC (*MRSA in the Community*: http://www.cdc.gov/mrsa/community/index.html) to learn how MRSA can be transmitted in the community setting.
2. Use obesity prevalence maps from the CDC (*Obesity and Overweight*: http://www.cdc.gov/obesity/data/prevalence-maps.html) to learn more about obesity in the United States, including the state in which you live. Which states have the highest rates of obesity, and which states have the lowest rates of obesity?
3. Explore *CDC Vital Signs* to learn more about differences in cigarette smoking across states and different groups within the United States (*Tobacco Use & Second Hand Smoke*. CDC Vital Signs. September 2010: http://www.cdc.gov/vitalsigns/TobaccoUse/Smoking/index.html). Learn more about the health risks of smoking and secondhand smoke.
4. Learn more about the role of genomics from the CDC's Healthy People 2020 website (http://www.healthypeople.gov/2020/topics-objectives/topic/genomics). Which diseases have a strong relationship to genomics, and how can this information be used by consumers and physicians to prevent disease?
5. Review the article *Global Health in the Clinical Laboratory* (*Critical Values*. 8:24-27, April 2015: http://www.ascp.org/Newsroom/Critical-Values.html) to learn how Emory University in Atlanta, Georgia prepared to accept and treat patients traveling from West Africa who were infected with the Ebola virus. What special isolation procedures were used?