CENGAGE

FIFTH EDITION

INTRODUCTION TO HEALTH CARE

LEE HAROUN
DAKOTA MITCHELL

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***Introduction to Health Care*, Fifth Edition**
Lee Haroun and Dakota Mitchell

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Preface

Introduction to Health Care, Fifth Edition, is designed as an introductory text for students who are entering college-level health care programs or for those who believe they may be interested in pursuing a career in health care. The fundamentals common to all health care professions are presented in this full-color text to create a foundation on which students can build when they take their specific professional courses. The topics included are appropriate for professions that involve direct patient care, such as nursing and dental assisting, as well as those that provide support services, such as health information technology and pharmacy technician. The goal of the text is to present a broad base of health care essentials. Therefore, skills and procedures that apply only to specific professions are not included.

The text is written in easy-to-understand language. A variety of learning exercises are included in each chapter. These exercises are designed to appeal to the different ways that students comprehend and learn material. The text can be used by students as a reference book after completion of their introductory courses.

CONTENT FOR TODAY'S HEALTH CARE PROFESSIONAL

Introduction to Health Care, Fifth Edition, includes topics essential for today's student and tomorrow's health care professional. The basic concepts that create the foundation for health care education have been expanded beyond those usually included in an introductory text. The following topics have been included in response to the current needs of health care educators and employers:

- Thinking skills
- Study techniques
- Complementary and alternative medicine
- Prevention and wellness strategies
- Lifelong learning and continuing education
- Documentation
- Cost-control measures
- Performance improvement
- Personal efficiency
- Customer service

EMPHASIS ON THINKING SKILLS

The dramatic growth of the health care industry promises to provide increasing numbers of employment opportunities for graduates of health care programs. At the same time, today's graduates face new challenges. Changes in health care are rapid and continuous. Professionals at all levels are being given additional responsibilities. Efficiency and flexibility, combined with competency, are vital to workplace success. To be competent and successful in this ever-changing environment, health care professionals must be able to think for themselves and learn and adapt as necessary to meet current employment demands.

The authors recognize the need of health care educators for materials that can assist them in preparing students to assess new situations, determine appropriate action, and apply on the job what they learned in the classroom. This text is designed to help meet this need. Students are introduced to the concept of thinking like a health care professional (also called "critical thinking") in Chapter 1. The specific skills that make up applied thinking are explained in everyday language. A five-step problem-solving model is clearly described to help students systematically approach new situations. Every chapter includes exercises called "Thinking It Through" that require students to apply the concepts presented in the text to typical on-the-job situations. Each chapter then concludes with two application exercises and one problem-solving exercise that provide opportunities to summarize and apply the chapter content. For a detailed review of the features in this book, see *About This Book* on page xix.

ORGANIZATION OF THE TEXT

Introduction to Health Care, Fifth Edition, is divided into nine units that contain between two and five chapters of related topics. The following overview highlights many of the major concepts included in the text.

Unit 1 | Health Care Today

- Characteristics and trends of modern health care, including changing patient demographics, challenges in health care today, and complementary and alternative medicine
- Descriptions of many health occupations, organized by type of work performed
- Explanation of how to think like a health care professional
- Personal characteristics required of health care professionals
- Legal and ethical responsibilities of health care professionals

Unit 2 | The Language of Health Care

- Introduction to basic concepts of medical terminology
- Examples of common word elements
- Suggested ways to approach the study of terminology and to learn it systematically
- Review of math skills necessary for health care applications
- Measurement systems and methods of converting between systems
- Calculating drug dosages
- Tips for dealing with math anxiety

Unit 3 | The Human Body

- Brief overview of the basic organization, structure, and functions of the body systems, intended as an introduction rather than a complete anatomy and physiology course
- Examples of diseases and conditions related to each body system
- Preventive measures for each system, including lifestyle management tips
- Physical and mental milestones of growth and development over the life span and the implications when providing health care

Unit 4 | Personal and Workplace Safety

- Basic skills and habits needed to protect both health care professionals and patients
- Explanations of body mechanics and infection control
- Hands-on skills, such as using a fire extinguisher

Unit 5 | Behaviors for Success

- Self-care practices important for health care professionals, including dealing with stress
- Characteristics of professionalism essential for career success
- Lifelong learning and continuing education strategies

Unit 6 | Communication in the Health Care Setting

- Patients as individuals
- Basic human needs
- Acknowledging diversity while avoiding cultural stereotypes
- The six-step communication process
- Using questions and observations to assess specific patient needs
- Basic oral and written communication techniques
- Overview of computer applications in health care
- Basics of health care documentation and medical records

Unit 7 | Health Care Skills

- Basic assessment skills
- Hands-on skills, such as taking vital signs and measuring height and weight
- Normal ranges and significant changes
- Step-by-step instructions for performing basic emergency procedures (Cardiopulmonary resuscitation is not included because certification is often required of health care students and the course is taught by certified instructors who use annually updated, written materials instead of a textbook.)

Unit 8 | Business of Caring

- Health care as a business
- Improving care while controlling costs
- Working efficiently
- Customer service

Unit 9 | Securing and Maintaining Employment

- Application of job search skills to health care employment
- Tips for remaining successfully employed
- Behaviors for job success, including teamwork and leadership skills
- Employment legalities

MAJOR CHANGES TO THE FIFTH EDITION

Book Chapter	Description of Changes
Chapter 1	• Reordered material in chapter to be more logical: beginning chapter with "Getting Off to a Good Start" and ending with career profiles • Added more specific study tips and resources • Deleted references to learning styles, now considered inaccurate • Added information and suggestions about volunteering and joining a professional organization in preparation for a career in health care • Updated career information and added Occupational Outlook Handbook web addresses for each within the text • Added information about the levels of education needed for various health care careers
Chapter 2	• Reorganized chapter content for more logical presentation • Updated health care industry statistics • Expanded list of advancements in medicine and health care • Added section on future of health care, including discussion of precision/personalized medicine • Added topics: health disparities, racism in health care, managing the opioid crisis and increase in suicides, and concerns about TV drug ads • Added definition of western medicine • Deleted some events in table on history of health care to make more manageable for students
Chapter 3	• Added sections on professional values, patient rights, and legalization of medical marijuana • Updated information on physician-assisted suicide • Expanded information on the Patient Care Partnership
Chapter 4	• Added root words for colors, how drugs are named, eponyms, and acronyms
Chapter 5	• Revised section on solving problems with proportions to make more clear • Added the basic formula method for calculating medication dosages • Added section on statistics in health care
Chapter 7	• Added a few diseases and conditions related to the various body systems
Chapter 8	• Revised Erikson's stages of psychosocial development
Chapter 9	• Major reorganization of content for more logical flow • Added section specific to exertion injuries • Revised discussion about back belts, including opinions that they should not be used routinely. Replaced all figures showing health care professionals wearing back belts • Included ways to help prevent back injuries
Chapter 10	• Reorganized chapter content for better flow • Updated current disease threats • Added information about influenza
Chapter 11	• Added sample contents of an incident report • Updated safety data sheets, previously called material safety data sheets • Added information about violence in the health care workplace

(continued)

Book Chapter	Description of Changes
Chapter 12	• Reorganized section on nutrition for better flow • Updated information on effects of cholesterol in foods • Revised definitions of carbohydrates and fiber • Distinguished between different types of fats • Added information about sodium and its effects • Added discussion about sugar • Expanded section on causes of overweight and obesity • Updated statistics for: ° Leading causes of death in the United States ° Prevalence of overweight and obesity ° Deaths due to smoking and secondhand smoke ° Incidence and deaths from substance abuse ° Cases of HIV
Chapter 13	• Added discussion about empathy • Updated information about tattoos and piercings in the workplace • Added professionalism outside the workplace, including on social media
Chapter 14	Added new sections on professional development, learning from role models and mentors, and career ladders
Chapter 15	• Deleted table listing characteristics of various cultural and ethnic groups • Expanded information on bias, including strategies for recognizing bias Added explanation of implicit bias • Expanded view of culture to include factors such as socioeconomic status (poverty) • Revision of section on Abraham Maslow, including deletion of his hierarchy
Chapter 16	• Added discussion of health literacy • Explained "teach back" as a communication-check technique • Added discussion of communication through the life span • Expanded section on communicating with people who have dementia • Revised and updated the patient education section
Chapter 17	• Added material on writing emails and email etiquette
Chapter 18	• Added guidelines for writing and sending professional emails • Added section on computerized testing in medical labs • Moved information on electronic medical records to Chapter 19
Chapter 19	• Reorganized content for more logical flow • Added information on purposes of medical documentation • Added negative consequences of poor records • Moved electronic records to this chapter from Chapter 18 and expanded to include advantages, sample situation with a patient, challenges • Added section on cybersecurity • Expanded section on HIPAA, including sending protected information
Chapter 21	• Added RICE mnemonic for treating bone, joint, and muscle injuries and SAMPLE for getting information about an illness or injury • Updated information on properly removing ticks from the skin
Chapter 22	• Expanded information on Medicaid • Added section on Veterans' Health Administration • Added section on impact of health costs on individuals

(continued)

Book Chapter	Description of Changes
Chapter 23	• Added information about the following: ° Partnership for Patients ° The Joint Commission ° Agency for Healthcare Quality and Research ° American Hospital Association: Patient Care Partnership • Added sections on reducing medical errors, including medication errors
Chapter 24	• Updated job-search websites, deleting those no longer available • Added discussion about avoiding job-search scams on the Internet • Expanded information about using the Internet in the job search
Chapter 26	• Added section on advancing in one's career ("Moving Up")

STUDENT RESOURCES

Online Resources

Online resources are available to enhance the learning experience. Additional resources include:

- PowerPoint® presentations
- Anatomy and pathophysiology videos
- Health care–related videos
- Mathematics tutorials

Redeeming an Access Code:

1. Go to: http://www.cengage.com
2. Register as a new user or log in as an existing user if you already have an account with Cengage Learning or cengage.com
3. Select **Go to My Account**
4. Open the product from the My Account page

Animations and Videos Included on the Online Resources

Chapter	Animation Topic
4	Word Parts Work Together
4	Combining Word Roots
4	Dangerous Abbreviations
6	Anatomy of a Typical Cell
6	Body Planes
7	Shoulder Injuries
7	Skin
7	The Heart (Conduction System)
7	The Blood
7	Types of Fractures
7	Respiration

(continued)

Chapter	Animation Topic
7	Digestion
7	Urine Formation
7	Vision
7	Hearing
7	Endocrine System
7	Female Reproductive System
7	Male Reproductive System
7	Types of Muscle Tissue
7	Anatomy of the Heart
7	Firing of Neurotransmitters

Chapter	Video Topic
9	Body Mechanics
10	Infection Control
10	Controlling Disease
10	Sterile Gloves and the Sterile Field
10	The Chain of Infection
10	Transmission-Based Precautions
10	Proper Handwashing
10	Removing Contaminated Gloves
10	Sterilizing Instruments in Autoclave
11	Fire Safety
11	Using a Fire Extinguisher
17	Business Correspondence

(continued)

Chapter	Video Topic
20	Thermometers (Chemical-dot)
20	Digital/Electronic Thermometers
20	Measuring a Tympanic Temperature
20	Measuring a Temporal Artery Temperature
20	Measuring Apical and Radial Pulse
20	Counting Respirations
20	Measuring Height and Weight
20	Measuring Blood Pressure
21	Allergic Reaction Management
21	Burns
21	Obstructed Airway

Math Tutorials for Chapter 5
Convert between Celsius and Fahrenheit Temperatures
Weight and Volume Equivalents
The Metric System
The Apothecary System
An Introduction to Decimals
Adding and Subtracting Fractions
Fractions, Decimals, Ratios, and Percent
Dividing Fractions
Fractions and Decimals

INSTRUCTOR RESOURCES

Resources for instructors include:

- Cognero® Testbank makes generating tests and quizzes a snap. You can create customized assessments for your students with the click of a button. Add your own unique questions and print tests for easy class preparation.
- Customizable instructor slide presentations created in PowerPoint® focus on key concepts from each chapter.
- Electronic Instructor's Manual includes the following items to help instructors most effectively use the text in planning and teaching an introductory course:
  - Suggested answers to "Thinking It Through" and "Application Exercises" found in the text
  - Procedure check-off forms for evaluating skills
  - Suggestions for class activities
  - Teaching thinking skills
  - Answers to review questions found at the end of each chapter in the text
  - Websites and corresponding activities to support and expand on the information presented in the text and provide enrichment assignments for students.

MINDTAP: EMPOWER YOUR STUDENTS

MindTap is a platform that propels students from memorization to mastery. It gives you complete control of your course, so you can provide engaging content, challenge every learner, and build student confidence. Customize interactive syllabi to emphasize priority topics, then add your own material or notes to the eBook as desired. This outcomes-driven application gives you the tools needed to empower students and boost both understanding and performance.

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To learn more, visit www.cengage.com/mindtap

INFECTION CONTROL AT A GLANCE

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Infection Control	Scope of the problem, regulatory agencies	218–219
Microorganisms	Types of microorganisms	219–224
How Infections Spread and Preventing Infection	Breaking the chain of infection by using various methods, including standard and transmission precautions and asepsis	224–245
Procedures		
10–1 Handwashing	These procedures show step-by-step directions and rationales with accompanying figures to illustrate the steps.	227–228
10–2 Nonsterile Gloves		230–231
10–3 Applying and Removing PPE		232–235
10–4 Sterile Gloves		237–239
The Challenges	The most common contagions that health care professionals may encounter, including drug resistant organisms	245–253
Reporting Accidental Exposure	OSHA regulations that apply to all health care facilities	253

LIST OF VITAL SIGNS PROCEDURES

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20–1	Temperature	Measures how much heat is in the body. An elevation may indicate that an infection or other disease process is present	421–423
20–2	Radial Pulse	Measures how fast the heart is beating when felt at the wrist	424–425
20–3	Apical Pulse	Measures how fast the heart is beating by listening over the heart with a stethoscope	426–427
20–4	Respirations	Measures how fast the patient is breathing	428
20–5	Blood Pressure	Indicates how hard the heart is working to distribute blood to all parts of the body	431–432

LIST OF FIRST AID PROCEDURES

Procedure Number	First Aid Procedure	Page Number(s)
21–1	Allergic Reactions	445–447
21–2	Bleeding and Wounds	448–452
21–3	Bone, Joint, and Muscle Injuries	453–455
21–4	Facial Injuries	456–457
21–5	Burns	459–461
21–6	Drug-Related Problems	462
21–7	Poisonings	463
21–8	Temperature-Related Illnesses	464–465
21–9	Other Common Conditions	466–473
21–10	Applying a Triangular Sling	474–475
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21–13	Applying a Bandage to a Finger	478

Dedication

In memory of David, who continues to inspire.

—Lee Haroun

To the future health care professionals who will dedicate their time and energy to taking care of those in need of their services. May your career be as rewarding to you as mine is to me.

—Dakota Mitchell

About the Authors

Lee Haroun has a Master's of Art in Education from Portland State University (Oregon), a Master's in Business Administration from National University in San Diego, and a Doctorate of Education from the University of San Diego.

She has more than 35 years' experience in teaching and educational administration and has developed curricula for a variety of postsecondary programs, including occupational therapy assistant, health information professional, insurance coder, and patient care technician.

Lee is the author of *Career Development for Health Professionals* (Elsevier Science); co-author of *Teaching Ideas and Classroom Activities for Health Care* with Susan Royce (Cengage Learning); co-author of *Occupational Therapy Fieldwork Survival Guide* with Bonnie Napier-Tibere (F. A. Davis; out of print); and technical writer for *Essentials of Health and Wellness* by James Robinson and Deborah McCormick (Cengage Learning).

Dakota Mitchell has a Master's of Science degree in Nursing from the University of California, San Francisco, and a Master's in Business Administration degree from the University of Santa Clara. The combination of these two degrees provides a framework for understanding and functioning within the current and rapidly evolving world of health care today.

Dakota has 30-plus years of experience in health care, including education, management, and curriculum consultation. Besides many years in classroom and clinical teaching, she has developed and implemented unique and innovative health care programs at both the vocational and associate's degree levels.

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Dr. Susan Grant
Assistant Professor
Harper College- Health Science Palatine, IL

Mischelle Monagle, MSN, MBA, RN
Dean of College of Nursing & Health Professions
Carl Sandburg College Galesburg, Illinois

Shirley J. Cherry, Ed.D., R.T. (R)
Associate Professor and Program Director
Radiologic Science East Tennessee State University
Johnson City, TN

S. Summers
Adjunct Professor
Johnson County Community College Overland Park, Kansas

About This Book

Objectives: Overview of chapter content and goals for learning. Review these before beginning to read the chapter and use the objectives to check your progress after completing the chapter.

Unit I Health Care Today

CHAPTER 1

Your Career in Health Care

KEY TERMS

assessment
biases
career ladders
certification
diagnostic
integrity
licensure
manual dexterity
objective data
opinions
problem-solving process
registration
reliable
scope of practice
signs
subjective data
symptoms
therapeutic

OBJECTIVES

Studying and applying the material in this chapter will help you to:

1. Describe the current economic status of the health care industry.
2. Describe the general employment projections for the health care industry.
3. List the ten health care jobs expected to have the largest percentage increases between 2016 and 2026, according to the U.S. Department of Labor Statistics.
4. List the six health care jobs expected to have the highest numbers of openings between 2016 and 2026, according to the U.S. Department of Labor Statistics.
5. Explain why work in health care can be both satisfying and demanding.
6. Describe the essential core qualities demonstrated by effective health care professionals.
7. Give examples of how students can apply the essential core qualities while they are in school.
8. Explain the meaning of "learning for mastery."
9. Explain how students can use questions to master new subjects.
10. Give examples of suggestions to improve your note-taking, reading, writing, and test-taking skills.
11. Describe the advantages and challenges that may be experienced by adult students who are returning to school.
12. List the five techniques that adult students can use to develop their personal organization and time management skills.
13. Explain the meaning of "thinking like a health care professional."
14. Describe the five-step problem-solving process.
15. List the personal factors that should be considered when choosing a health care career.
16. List the five levels of education typical for health care career fields.
17. Explain the purpose of standards for health care professionals.
18. Give the meaning of the following terms as they pertain to health care professional standards: certification, registration, and licensure.
19. Explain the meaning of school accreditation and name the two major accreditation organizations for health care programs.
20. List the four requirements students typically must meet before taking professional exams.
21. Describe the four classifications of health care careers and give three examples of careers for each classification.
22. State the educational and certification requirements, major duties, and attributes necessary for success in occupations in which you are interested.
23. List the eight resources recommended for students to learn more about specific health care careers.

The Case of the Confused Student

Kevin Yang is a recent high school graduate who hopes to pursue a career in health care. He has enrolled to start classes in September at a local community college that offers many health care programs. Last spring Kevin attended two career fairs at local hospitals and learned about a variety of careers. He knows that he wants to combine his mechanical aptitude with his desire to work with people, but he feels

(continues)

Key Terms: List of important vocabulary and key concepts. Understanding vocabulary is critical to understanding the concepts presented in the chapter. Key terms are bolded and defined the first time they appear in the chapter. There is also a comprehensive glossary in the back of the book.

The Case of . . . : These health care scenarios introduce chapter content and show why the material in the chapter is important for the competent health care professional. An application exercise at the end of the chapter refers back to the case.

Fascinating Facts: Interesting information related to the chapter topics.

Fascinating Facts

In 2016, there were 46 million persons aged 65 and over, representing 15% of the total population. By 2060, this number is projected to be 98 million persons, who will make up 24% of the population. This increase will have major implications for the health care industry, driving the need for more professionals.

Source: https://www.prb.org/aging-unitedstates-fact-sheet/

Tables: These provide summaries of related facts. Use them as study aids and for quick reference.

Table 1–3 Dental Occupations

Career	Education	Testing and Approval
Dentist (DDS or DMD)	2–4 years college preprofessional education 4 years dental school 2–4 years additional education if seeking specialty	Licensed by states: 1. Graduate from accredited dental school 2. Pass written and practical exams
Dental Hygienist (RDH)	Associate's or bachelor's degree 2–4 years depending on program requirements	Licensed by states: 1. Graduate from accredited dental hygiene school 2. Pass national board exams administered by the American Dental Association Joint Commission on National Dental Examinations 3. Pass state and/or locally administered clinical exams 4. Pass state exam covering dental hygiene law
Dental Assistant (CDA or RDA)	1–2 year educational program (recommended) or on-the-job training	Requirements vary by state; voluntary certifications available through Dental Assisting National Board
Dental Laboratory Technician	On-the-job training or 2-year associate's degree program	Voluntary certification available from National Association of Dental Laboratories and/or National Board for Certification in Dental Laboratory Technology

Boxes: These include special features and additional information that expand on and support the material presented in the chapter.

Box 1–1

Examples of Health Care Occupations

Art Therapist
Athletic Trainer
Audiologist
Health Educator
Medical Illustrator
Medical Librarian
Medical Photographer
Medical Writer
Music Therapist
Speech and Language Pathologist

Colored photos and illustrations: These reinforce important concepts and topics. Use them to increase your understanding of the material.

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FIGURE 1–5 As older nurses retire, there will be a great need for newly trained registered nurses.

Thinking It Through

Craig Oakley is a physical therapy assistant who does home visits for a rehabilitation service. One of his patients, Mr. Singh, suffers from rheumatoid arthritis and has asked Craig's opinion about taking Chinese herbal remedies that he has read help restore joint health.

1. How should Craig respond?
2. What are some of the resources he can consult in order to find out more about the treatment?
3. What precautions should Craig follow when speaking with Mr. Singh about complementary and alternative therapies?

Thinking It Through: Located throughout the chapter, these exercises are a very important part of this text. The health care scenarios require you to think about the concepts presented in the chapter and use them to resolve typical problems encountered by health care professionals. Use the exercises to develop the thinking skills necessary to be a successful health care professional.

PROCEDURE 10–1

HANDWASHING

Procedure	Rationale
1. Turn faucet on using a clean, dry paper towel. (See Figure 10–5a.)	Faucets are always considered contaminated.
2. Run warm water over hands and wrists.	Warm water helps remove superficial dirt and microorganisms.
3. Do not lean against the sink, and avoid splashing clothing with water.	The sink is always considered contaminated; water splashed from the sink is contaminated, and wet material easily conducts microorganisms.

Procedures: A step-by-step format that helps you master basic hands-on skills. Pay special attention to the rationales that explain the reasons for the actions.

SUGGESTED LEARNING ACTIVITIES

1. Create a personal plan for developing the core qualities demonstrated by health care professionals.
2. Determine if there are study skills you need to improve and create a plan to improve them.
3. Choose a problem in your life that you would like to work on and apply the five steps of the problem-solving process. Report on the results.
4. Seek opportunities to observe health care professionals at work. Report on the qualities they demonstrate that you believe make them effective.
5. Research an occupational area or specific career that interests you: interview a working professional, send for information or visit the Internet site of the appropriate professional organization (see Appendix 1), request a job description from a local facility, and/or read the job descriptions in the *Occupational Outlook Handbook*.

Suggested Learning Activities: Try these interesting projects that include doing research on the Internet, reporting on observations from daily life, and visiting health care facilities.

WEB ACTIVITIES

WikiHow
https://www.wikihow.com/Improve-Your-Study-Skills
How to Improve Your Study Skills

1. Read this illustrated guide.
2. Are there any suggestions you think might help you?
3. If so, try them for a couple of weeks and report on how they work for you.

Web Activities: Use these guided assignments to increase your research skills and learn more about the chapter content. The activities refer you to specific websites.

REVIEW QUESTIONS

1. What are the ten significant events that changed the way health care was delivered?
2. What are the definitions of the following terms: gene therapy and targeted drug therapy?
3. What is today's leading prevention and treatment option?
4. Explain the meaning of specialization and its impact on health care.
5. What are the effects of the aging population on health care?
6. What has happened with health care costs over the past few decades?

Review Questions: The questions are keyed to the chapter objectives to ensure your mastery of the chapter content. Use them to check your learning and identify areas that need more study.

PROBLEM-SOLVING PRACTICE

A growing number of children in Trueville, USA, are becoming overweight and obese. A group of concerned citizens has organized a committee to find ways to help children in the community attain normal weights and raise their levels of fitness. How might the committee use the five-step problem-solving process?

Problem-Solving Practice: Practice your skills with these typical, real-world problems encountered by students and health care professionals.

APPLICATION EXERCISES

1. Refer back to The Case of the Confused Student at the beginning of the chapter. Using the information in this chapter, list your recommendations for occupations that Kevin should investigate.
2. Juan has always been interested in helping people. He also likes science and has maintained good grades throughout high school in chemistry, biology, and physics. He has enrolled in the local community college and is taking "Introduction to Health Care." Juan thinks that a career in health care might be for him, but he doesn't feel that he knows enough to make a career decision at this time. He's not sure what's out there or what jobs would be appropriate for him.
   a. What does Juan need to know in order to conduct an effective career search?
   b. Describe how he can use the problem-solving process to help him make a tentative career decision.
   c. Explain methods that Juan can use to research and learn more about different career options.

Application Exercises: Opportunities to apply the chapter's major concepts to typical health care situations. Use these exercises to practice using your knowledge in ways similar to those you may encounter on the job.

Unit 1

Health Care Today

CHAPTER 1

Your Career in Health Care

KEY TERMS

assessment
biases
career ladders
certification
diagnostic
integrity
licensure
manual dexterity
objective data
opinions
problem-solving process
registration
reliable
scope of practice
signs
subjective data
symptoms
therapeutic

The Case of the Confused Student

Kevin Yang is a recent high school graduate who hopes to pursue a career in health care. He has enrolled to start classes in September at a local community college that offers many health care programs. Last spring Kevin attended two career fairs at local hospitals and learned about a variety of careers. He knows that he wants to combine his mechanical aptitude with his desire to work with people, but he feels

(continues)

OBJECTIVES

Studying and applying the material in this chapter will help you to:

1. Describe the current economic status of the health care industry.
2. Describe the general employment projections for the health care industry.
3. List the ten health care jobs expected to have the largest percentage increases between 2016 and 2026, according to the U.S. Department of Labor Statistics.
4. List the six health care jobs expected to have the highest numbers of openings between 2016 and 2026, according to the U.S. Department of Labor Statistics.
5. Explain why work in health care can be both satisfying and demanding.
6. Describe the essential core qualities demonstrated by effective health care professionals.
7. Give examples of how students can apply the essential core qualities while they are in school.
8. Explain the meaning of "learning for mastery."
9. Explain how students can use questions to master new subjects.
10. Give examples of suggestions to improve your note-taking, reading, writing, and test-taking skills.
11. Describe the advantages and challenges that may be experienced by adult students who are returning to school.
12. List the five techniques that adult students can use to develop their personal organization and time management skills.
13. Explain the meaning of "thinking like a health care professional."
14. Describe the five-step problem-solving process.
15. List the personal factors that should be considered when choosing a health care career.
16. List the five levels of education typical for health care career fields.
17. Explain the purpose of standards for health care professionals.
18. Give the meaning of the following terms as they pertain to health care professional standards: certification, registration, and licensure.
19. Explain the meaning of school accreditation and name the two major accreditation organizations for health care programs.
20. List the four requirements students typically must meet before taking professional exams.
21. Describe the four classifications of health care careers and give three examples of careers for each classification.
22. State the educational and certification requirements, major duties, and attributes necessary for success in occupations in which you are interested.
23. List the eight resources recommended for students to learn more about specific health care careers.

overwhelmed by the number of choices in the health care field. He is not sure how to learn more about the requirements and rewards of various occupations, what the daily duties would be, and how much education is necessary to enter them. He is also unsure how to best go about making a decision that will significantly affect his life. This chapter includes basic information about a variety of health care career areas and occupations, a problem-solving process that can be used to make effective personal and professional decisions, and tips on succeeding in a health care career program.

YOUR FUTURE IN HEALTH CARE

Health care is an exciting and growing field. The purpose of this text is to help you make an informed career choice and acquire the basic knowledge to continue the studies necessary for your chosen field.

The health care industry is the largest service employer in the United States, providing more than 18 million jobs and the need for health care professionals continues to grow (https://www.cdc.gov/niosh/topics/healthcare/default.html). According to the United States Bureau of Labor Statistics, the health care industry will increase by 18% and add 2.4 million new jobs between 2016 and 2020 (https://www.bls.gov/ooh/healthcare/home.htm). This is faster than the average growth of all other occupations. Federal economists report that, in 2017, the amount spent on health care was $3.5 trillion. Further, it is projected that the cost of health care will continue to grow at least 4% annually.

Many health care occupations are projected to have employment increases of more than 25%. (See Table 1–1.) Ten of the 20 fastest-growing jobs in all industries are health care–related. At the same time, 6 of the 20 occupations with the largest numerical increases are in health care. (See Table 1–2.) It should be noted that various sources give different occupations as having the fastest growth and highest numbers of new hires; however, health care is included in all lists. The information provided here is from the U.S. Bureau of Labor Statistics.

Careers in health care can be sources of great satisfaction. Health care professionals perform valuable services that make a significant contribution to the community. Each day their work makes a difference in the quality of life of those they serve. Whether you choose to work directly with patients or provide support services, be assured that what you do is important and of benefit to others.

As well as providing satisfaction, health care work makes many demands on those who pursue it. The work must be taken seriously because it affects the well-being of others. All tasks must be performed thoughtfully and conscientiously. Nothing can be taken for granted or done automatically, not even routine assignments. Health care professionals must be willing to devote their full attention to everything they say and do. Potential problems must be noted and addressed before they become critical. The consequences of mistakes can be devastating if, for example, a prescription for medication is incorrect or the wrong procedure is performed. The work can also be stressful. Depending on the chosen occupation, it can involve long hours, dealing with the death of patients, and working quickly under pressure. (See Figure 1–1.)

Table 1–1 Examples of Growing Health Care Jobs

Job	Projected Percentage Increase in Employment, 2016–2026
Home Health Aide	47%
Personal Care Aide	39%
Physician Assistant	37%
Nurse Practitioner	36%
Physical Therapist Assistant	31%
Physical Therapist Aide	29%
Medical Assistant	29%
Occupational Therapy Assistant	29%
Physical Therapist	28%
Massage Therapist	26%

Source: Bureau of Labor Statistics. Occupational Outlook Handbook. Fastest Growing Occupations. https://www.bls.gov/ooh/fastest-growing.htm

Table 1–2 Occupations with the Largest Numerical Increases

Job	Numerical Increase in Positions, 2016–2026
Personal Care Aides	777,600
Registered Nurses	438,100
Home Health Aides	431,200
Medical Assistants	183,900
Nursing Assistants	173,400
Medical Secretaries	129,000

Source: https://www.bls.gov/ooh/most-new-jobs.htm/

FIGURE 1–1 Successful health care professionals work hard. At the same time, they enjoy the satisfaction of helping others.

GETTING OFF TO A GOOD START

Health care educational programs are designed to prepare students to succeed in the workplace. Instructors dedicate themselves to helping students who put forth the necessary effort to graduate and become employed. Take advantage of the learning opportunities available in your school and commit yourself to doing your best toward becoming a competent, qualified health care professional.

Essential Core Qualities of Health Care Professionals

As a student, you have many opportunities in school to begin to practice good workplace habits. Work hard now to develop the skills that will make you a valuable employee. At the same time, you can be acquiring habits that also contribute to academic success. The qualities essential for health care professionals to be effective and successful can be applied in the classroom, in the lab, and at the clinical (externship/internship/fieldwork) site. Start now while you are in school to develop and apply them.

- Care about others: Have compassion. Apply knowledge and skills to decrease suffering and increase the well-being of others. When necessary, be willing to put the needs of patients ahead of your own. Have respect for all people and help them regardless of their race, nationality, economic status, religion, age, or lifestyle preferences. (See Figure 1–2.)
  - Start now: Show respect and consideration for instructors and classmates. Be kind to everyone, regardless of his or her background. Refrain from talking during lectures. Prepare for classes so the instructor does not need to take time to answer questions about material covered in the reading or study assignments. Practice courtesy in the classroom and throughout the school. Volunteer to help others, as needed or as possible.
- Have **integrity**: Be honest at all times. Respect the privacy of others. Be loyal to the employer. Accept responsibility for your actions.
  - Start now: Do your own work. Never copy the homework assignments of others or cheat on exams. Always tell the truth. Never share anything told to you in confidence.
- Be dependable: Be at work on time and as scheduled. Follow through and finish all assigned tasks. Perform work accurately and completely. Work without constant supervision and reminders.
  - Start now: Be at school on time and attend all classes. Complete assignments on time. Strive for accuracy in all written and practical assignments. Follow through on all obligations and anything you have volunteered to do.
- Work well with others: Strive to understand the feelings and needs of others. Be courteous and considerate. Practice good communication skills. Be a good team member by cooperating and contributing to the achievement of group goals. Take directions willingly from the supervisor.

FIGURE 1–2 One of the most important qualities of the health care professional is compassion.

Fascinating Facts

In 2016, there were 46 million persons aged 65 and over, representing 15% of the total population. By 2060, this number is projected to be 98 million persons, who will make up 24% of the population. This increase will have major implications for the health care industry, driving the need for more professionals.

Source: https://www.prb.org/aging-unitedstates-fact-sheet/

- Start now: Be understanding of the needs of instructors and classmates. Participate in class. Do your share when working on group assignments.

- Be flexible: Be willing to adapt to changing conditions and emergencies. Do what is needed to carry out tasks. Acquire knowledge and skills necessary to keep up with advances in technology and changes in the way health care is delivered.
  - Start now: Accept instructional differences, changes in class schedules, and other unexpected occurrences. Be willing to cooperate as needed.

- Be willing to learn: Keep skills up to date. Ask questions, attend workshops, read professional publications, use the Internet, and continue to acquire new skills.
  - Start now: Be willing to learn: Take your studies seriously. Make school a high priority. Dedicate sufficient time to studying throughout the length of each course to ensure maximum learning.

Learning for Mastery

Health care professionals must know what they are doing. Mistakes on the job can result in serious consequences. Therefore, it is essential that students commit to learning the material presented in their courses. Learning means more than just memorizing facts. It means striving to understand and remember information so that it can be applied to new situations. This understanding provides a basis for thinking like a health care professional, which is discussed later in this chapter.

Students who do only the minimum necessary to pass tests may think they are learning, but in reality, they are not likely to have acquired the long-term knowledge necessary to perform on the job. Students who study to understand *and always search out the why of the subject* increase their chances of becoming highly competent health care professionals who can think on their feet and meet new challenges as they arise.

One effective way for students to master subjects is to ask themselves questions about what they are learning or doing. Questions serve to gather information, expand your view of a subject, and stimulate the mind. They help ensure that actions are not based on false assumptions or insufficient information.

Questions can be asked mentally (to oneself) or of others. Think of the five *W*s plus the one *H*: What, When, Where, Why, Who, and How. The following examples show how questions can be used to promote learning:

- When learning new information, ask *why* it is important and to *whom? How* does it relate to what is already known?
- When working with patients, ask *what* might work best for them and *when* it should be done.
- When sharing important information with a classmate or coworker, ask yourself *what* you know about this person that will help you communicate most effectively.
- When working in a health care facility, consider *how* your work habits might be changed to improve overall efficiency.

Some students believe that the role of their instructors is to *tell* them rather than *ask* them. In reality, instructors who continually ask questions that require students to explain their answers and actions are encouraging them to learn and to think like health care professionals. Some instructors even respond to a student's question with another question. Their intention is to teach students to begin to think for themselves and trust that they are capable of finding the answer. Instructors also use questioning to guide students in pulling known facts together, making connections, and applying what they know to new situations. For example, suppose that a respiratory therapy student is working with a hospitalized patient. He has studied the illness presented by the patient and knows how to perform the prescribed breathing treatments. Through questioning, the instructor guides this student to explain why these particular treatments have been prescribed. The student is encouraged to consider the nature of the illness and the properties of the treatments and medications, and draw conclusions about the relationships among these factors.

Getting the Most from Your Studies

If necessary, spend some time now working to improve your study skills: taking notes, reading, writing, and preparing for tests. Something to keep in mind is that these skills can also help you to get a job and succeed. For example, taking a patient history requires good note-taking skills; understanding the instructions for a piece of equipment requires the ability to read and understand technical material; preparing a letter asking about job openings requires good writing skills; and if you think about it, everything you do when working with a patient is a test, something you must do correctly "to pass."

The following suggestions may help you to:

- Take good notes: Concentrate on writing down the important points, rather than everything the instructor says. Listen for clues from instructors about what is important. Write in outline form to keep notes organized. Set up pages using the Cornell System format to leave space for adding notes and questions after class when you review your notes. (See Figure 1–3.) *For more detailed information about the*

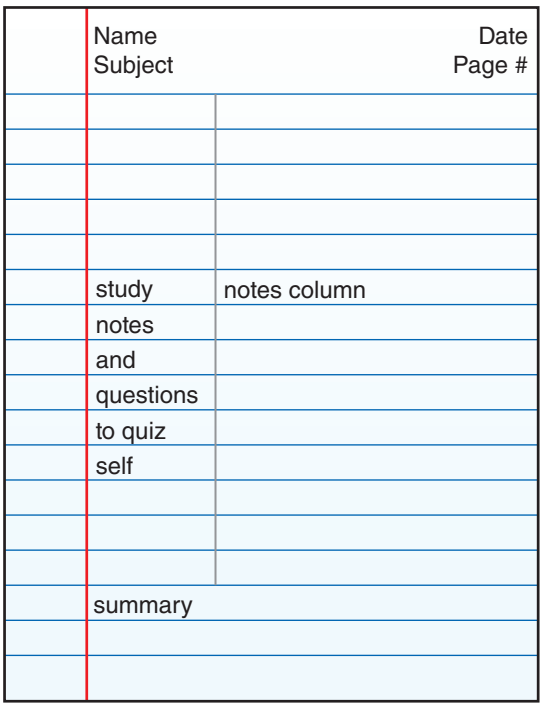

FIGURE 1–3 Page set-up for the Cornell note-taking system.

Cornell system, see http://lsc.cornell.edu/notes.html and http://www.openculture.com/2018/10/the-cornell-note-taking-system.html.

- Read for comprehension and learning: When reading textbooks or information on websites, start by skimming through the chapter or section. Then focus your attention by creating questions and reading for the answers. Create questions from articles or section titles and from the material itself. After reading a section of material, ask yourself the questions and try to answer without looking at the text. This has been shown to be one of the most effective ways to learn. *For more reading strategies, see https://www.educationcorner.com/textbook-strategies.html and https://learningcenter.unc.edu/tips-and-tools/reading-textbooks-effectively/.*
- Write: See Chapter 17 of this text. *Also, Purdue University's online writing lab has information on dozens of topics related to writing: https://owl.purdue.edu/owl/purdue_owl.html.*
- Prepare for tests: Plan to study every day, even for a short time. Reviewing material over time is much more effective than cramming at the last minute. Use the questions you create for reading and note-taking to practice. *For more information, see https://www.educationcorner.com/test-taking-strategies.html. Quizlet at https://quizlet.com/ that contains learning tools and flashcards on many subjects, and https://www.tests.com and http://www.testprepreview.com that contains free practice tests for a number of health care subjects and occupations.*

Volunteering

If you have the time, volunteering is an excellent way to jump-start your career. Not only do you learn skills, such as working with others, you learn more about the health care field and acquire information that can help you choose a career that is right for you. Although work in a health care environment is optimal, volunteering for non profits, such as Habitat for Humanity, also provide good experience.

Some educational programs have an admission requirement that you have some experience in the field you are entering. For example, university veterinary medicine programs require applicants to have a minimum number of hours of experience. And when looking for a job, you can list on your résumé the skills you learned and applied through volunteering. This also shows potential employers that you have initiative and a sincere interest in helping others.

Professional Organizations

Joining a professional organization while you are a student gives you networking opportunities, a chance to learn how to be successful in your chosen field, and access to workshops and other learning activities. And, as with volunteering, putting a professional membership on your résumé demonstrates your interest and initiative. See Chapter 14 and Appendix 1 for more information about professional organizations.

Returning Adult Students

Many students who enroll in health care programs are adults returning to school after working in other fields, raising families, and/or handling other adult responsibilities. Some adults find the experience of attending classes stressful and wonder if they have what it takes to study and learn new information and skills.

These fears are natural, but the fact is that most adults have acquired life experiences and skills they can apply to their learning which, in many cases, will help them become excellent students. For example, holding down a job contributes to the ability to set priorities, communicate, demonstrate dependability, and apply practical skills such as math. The self-confidence developed as a result of handling adult responsibilities can be applied to reviewing one's study skills, including those that may not have been used for many years.

The most pressing problem for many adult students is finding the time to fulfill all their responsibilities: attending

classes, studying, caring for the family, and perhaps holding down a full- or part-time job. Practicing good time management and personal organization skills, such as the following, can be helpful in handling the additional work of attending school:

- Start each day with a list of what needs to be accomplished, ranked from most to least important.
- Advise others of your study schedule. Plan care or activities for your children to allow you the time needed.
- Schedule time, even if for short periods, with family members. Some children enjoy doing homework with mom or dad.
- Create personal organization techniques, such as clustering errands, keeping things in repair, and planning backups to prevent wasting time and energy.
- Ask for help when you need it. Delegate tasks at home. Let another family member fix dinner once or twice a week.
- See the Time Management section in Chapter 12 for more suggestions.

LEARNING TO THINK LIKE A HEALTH CARE PROFESSIONAL

A common problem in health care today is that some graduates spend months, or even years, accumulating information, but are unable to apply it when they need it on the job. The lack of effective thinking skills is a primary reason for this unfortunate situation. Regardless of the health care area or occupational level chosen by students, it is essential that they learn to *think* like health care professionals. This type of thinking actually involves many skills and, in this text, has the following meanings:

- Learning for understanding, not simply to memorize facts
- Applying learned material to new situations
- Having an organized approach to problem-solving
- Basing decisions on facts, rather than on emotional reactions or **biases** (certain beliefs and feelings, usually negative, about a person because he or she belongs to a specific group or has certain characteristics)
- Drawing on many facts and creating relationships among them
- Locating reliable sources of information with which to make decisions
- Basing decisions on ethical principles (see Chapter 3)
- Practicing good communication skills when gathering and distributing information (see Chapters 16 and 17)
- Understanding exactly what one is legally allowed to do in one's profession, known as **scope of practice**

One of the major goals of this text is to provide students with opportunities to practice thinking like a health care professional. This discussion on thinking is being presented at the beginning of the text so that students will have maximum time to apply and practice thinking skills. The "Thinking It Through," "Application Exercises," and "Problem-Solving Practice" features, which appear in every chapter, encourage students to apply thinking skills to the topics presented.

Thinking proficiently can be applied to the personal, as well as professional, areas of your life. For example, buying a certain puppy simply because it is cute and seems the friendliest is an emotional decision. An informed, thinking decision involves learning about available breeds, physical and personality characteristics, common health problems, and methods of training. Knowing these facts will help ensure that the puppy selected best fits the new owner's lifestyle and will be a suitable companion.

Thinking like a health care professional can be described as an "examined process." This means not simply accepting situations without observing and considering the meaning of what is observed. Effective thinkers are aware of their thoughts and of why and how they are acting or making decisions.

As stated earlier, nothing in health care work can be done routinely and without thinking. Mindless actions occur as the result of not paying attention or basing decisions on ideas that have been accepted "just because." These ideas may come from family members, friends, personal experiences, television, movies, and magazines. Health care professionals must learn to think for themselves, gather facts, and use their own observations for making decisions.

Problem-Solving Process

Important applications of thinking skills are problem-solving and decision-making, two very important competencies for health care professionals. There are a variety of problem-solving and decision-making models. This book presents a five-step **problem-solving process** to help students and health care professionals approach problem-solving in an organized manner:

1. Identify the problem
2. Gather information
3. Create alternatives

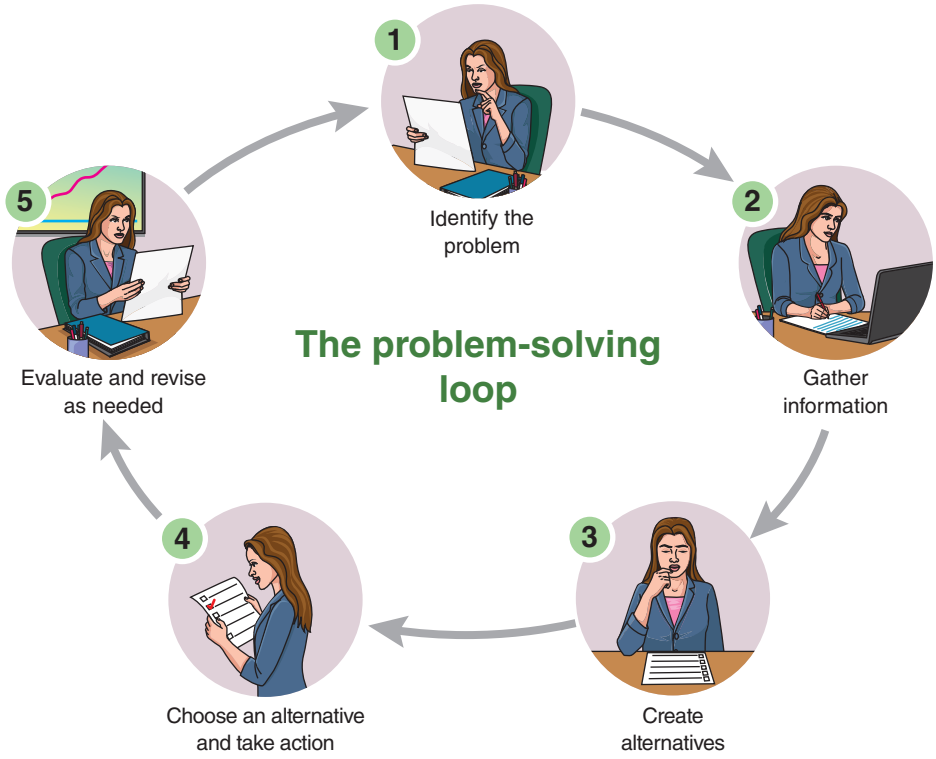

FIGURE 1–4 Steps in the problem-solving process.

4. Choose an alternative and take action
5. Evaluate and revise as needed

(See Figure 1–4.)

Step One—Identify the Problem

Identifying problems is not always as simple as it sounds. Factors that are described as *the problem* are often only *symptoms* of the problem. For example, Jamie, a radiologic technologist, does not receive the high scores she had hoped for on her performance review at work. When she receives the rating "poor" in the dependability category, she feels upset and believes that her problem is "receiving a poor evaluation because her supervisor dislikes her."

Identifying the real nature of problems requires a willingness to observe, pay attention, and confront difficult issues. Problem-solvers must look beyond what seems obvious and use questions effectively to identify the real situation. Denying or ignoring problems does not make them go away. Problems that are not addressed tend to get worse, because no action is being taken to resolve them. In Jamie's case, she must be willing to speak frankly with her supervisor about her low rating. It turns out that the real problem is actually what *caused* the poor evaluation, not the evaluation itself. In Jamie's case, it is her frequent tardiness.

Jamie's first reaction is, "I can't help it. My car is old and breaks down a lot." When her car won't start, she must rely on family and friends to drop her off at work. Their schedules are not the same as Jamie's, so she often arrives late.

Taking the time to think about what she has said ("I can't help it"), Jamie realizes that being at work on time is her responsibility. She is now able to identify the real problem: lack of reliable transportation. This enables her to start seeking effective solutions. Accepting responsibility for a problem makes it possible to start doing something about it.

Step Two—Gather Information

Good problem-solving is based on having accurate and reliable information. Acting on assumptions (untested ideas), **opinions** (beliefs not based on facts or knowledge), and emotions can result in poor decisions. In health care, gathering information is also known as **assessment**. There are many methods for gathering information:

- Review what is already known: What knowledge do I have about the problem or situation? About the causes? About possible solutions?
- Collect **objective data**: What can be observed? Measured? Tested? What are the facts? When working with patients, objective data are called **signs**.

- Collect **subjective data**: How do I feel about a situation? What do I want? What do others want? When working with patients, subjective data refer to what is reported by the patient, such as pain and feeling nauseated. Also known as **symptoms**, they cannot be directly observed or measured by the health care professional, but nevertheless must be taken into account.
- Conduct research: What are the facts? Are they from a **reliable** (trustworthy) source? How do I know? Are they scientifically based? (Can they be tested?)
- Ask for help: Who has useful knowledge? Are there experts available who can give me reliable information and help me find a solution?

When she starts out, Jamie finds the idea of solving her transportation problem overwhelming. The only solution that makes sense to her is buying a new car, but she knows that most likely she cannot afford one at this time. When she puts her fear aside and commits herself to gathering information, she discovers the following:

- Carpools have been organized at the facility where she works.
- The most economical new car for sale in her area costs $14,795.
- There are many articles on the Internet about how to buy a car.
- *Consumer Reports* magazine has a recent article about purchasing used cars and publishes annual reports on the performance of most auto models manufactured over the past 10 years.
- Her credit union sponsors car sales to help buyers who have limited funds to spend. They also offer low-interest loans to buyers who qualify.
- A cousin has an older car that he wants to sell.
- There is a bus route within half a mile of her apartment.
- A local college offers a workshop that teaches people how to buy a car.
- The local high school has an auto-mechanic training program. For a small fee, students will check over used cars before they are purchased.

Step Three—Create Alternatives

The third step in problem-solving is to create a list of alternatives. Ideas for solutions and actions are generated based on the information collected. All possibilities should be considered before one is selected. Some alternatives may prove, on further investigation, to be impractical or unworkable. It is essential to think through each one and consider the likely consequences, both positive and negative.

Based on her research, Jamie creates the following list:

1. Take the bus to work. When the weather is nice, walking to the bus stop will be a good form of exercise. In rainy weather, common about five months of the year where she lives, getting to the bus stop without getting soaked is not likely. Also, the bus ride takes about 30 minutes longer, each way, than driving to work.

Thinking It Through

Linda Stevens, LPN, works on a medical floor at the local hospital. One of the patients she has been assigned to take care of is Frank Gibbons, a 72-year-old newly diagnosed with diabetes (a condition in which the body does not produce enough insulin to control blood sugar levels). Part of Linda's process of preparing to care for her patients is to review the patients' charts for any new physician orders. She notes that Dr. Romero was in the previous evening and ordered the patient's blood sugar to be checked at 8 a.m. According to the results, insulin is to be given. (The higher the level of blood sugar, the greater the amount of insulin that is given, based on a formula defined by the physician.) Linda is a "thinking nurse" and starts to question if this is an appropriate order. She realizes that breakfast trays arrive at 7:30 a.m. on her floor and that Mr. Gibbons will already have eaten when she checks his insulin level at 8 a.m. She knows that after eating, a person's blood sugar normally increases for a few hours. This is why blood sugar tests are usually ordered when the patient has not eaten for a number of hours. Linda reasons that if she calculates the amount of insulin based on the temporarily elevated blood sugar levels, Mr. Gibbons will receive too much insulin and may have a negative reaction. Linda calls Dr. Romero to clarify the order. Dr. Romero states that he believed the breakfast trays did not arrive until 8:30 a.m. He thanks Linda for catching the error and changes the order.

- What might have happened if Linda had simply performed the blood sugar test exactly as ordered?
- Do you think Linda should have been considered responsible for the error if she had followed the orders exactly?
- Review the five *Ws* and *How* questions in relation to this situation. Give examples of questions that Linda may have asked herself.

2. Take the workshop on how to buy a car, then purchase a used one through the credit union. The monthly car payments and higher insurance rates will mean having to budget carefully to meet all expenses. Chances of buying a "lemon" can be reduced by using the service offered at the high school.
3. Continue to rely on others for rides to work. (Nonaction is also an alternative.)
4. Ask her father for a loan to buy a new car. While Jamie would like to have a shiny new car, she has been financially independent for several years and prefers to remain that way.

Some potential alternatives do not appear on the previous list because of information acquired during step two:

1. Carpool participants must have a reliable vehicle of their own. This might be an alternative later, if she purchases a dependable car.
2. Her cousin's car has more than 175,000 miles and is not one of the more reliable models, according to the reports she studied.

Step Four—Choose an Alternative and Take Action

Step four is critical. A common difficulty in problem-solving and decision-making is failure to act. Opportunities are missed and accomplishments not realized when there is no follow-through.

Jamie decides to combine two alternatives. There are five months of dry weather ahead, so she decides to take the bus to work. She will use the extra riding time to read and keep up with advances in radiology. In October, she plans to buy a used car. In the meantime, she will create a personal budget to control expenses and save money, and will learn more about how to buy a car and which model is likely to give her the best value.

Step Five—Evaluate and Revise as Needed

Evaluation means reviewing the results of the actions taken. Even well-thought-out plans can prove to be ineffective or have unexpected, negative consequences. And circumstances can change. It is sometimes necessary to make adjustments or choose another alternative. It may even require going back to step two to gather additional information and go through the process again.

When applying the process to health care work, it is important to remember that the needs of patients and facilities may change and/or additional information may become available. This can affect the process and force revisions to be made before the entire process has been completed. Problem-solving is a continual process.

MAKING A CAREER DECISION

There are hundreds of job titles in health care and the number continues to grow. They require a wide range of skills and abilities. Students who are considering a career in health care should learn as much as possible about the requirements, responsibilities, and conditions of their areas of interest. This knowledge will help them to make good career choices that match their preferences and abilities. For example, some individuals interested in health care would find the emergency medical technician's (EMT) job to be interesting and exciting. EMTs have opportunities to apply their skills to help others in significant ways, sometimes even saving lives. At the same time, the work is physically and emotionally demanding. It is often performed under difficult circumstances. Emergencies do not happen at convenient times and places. The schedules for EMTs include nights, weekends, and holidays, and they are called out to work in all types of weather conditions. All aspects of an occupation must be considered to increase the chances of choosing a career that will provide long-term satisfaction.

When choosing an occupation, students should carefully consider the following factors about themselves:

- Educational background
- The amount of additional time they are willing to dedicate to their education
- Natural abilities
- Personality traits
- The type of activities they most enjoy
- Preferences for workplace environment and conditions

Educational Requirements

Each occupational area, such as radiology and physical therapy, has positions that require different amounts of education and training and involve varying amounts of responsibility. Collectively, these levels are known as **career ladders**. The following levels are typical for health care:

- Professional: requires 4 or more years of college. Many require advanced training and degrees, such as a doctorate. Examples of occupations: dentist, physical therapist
- Technologist or Therapist: 3–4 years of college. Many require graduate degrees and advanced training. Examples of occupations: speech therapist, occupational therapist
- Technician: associate's degree, vocational training, on-the-job training. Examples of occupations: pharmacy technician, veterinary technician

- Assistant: associate's degree, vocational training, or on-the-job training. Example of occupations: physical therapist assistant
- Aide: vocational training, on-the-job-training. Examples of occupations: home health aide, psychiatric aide.

It is important to note that in spite of these general categories, the occupational title does not necessarily indicate the level of education required. For example, most states require a physical therapist *assistant* to have a 2-year associate's degree. However, becoming a veterinary *assistant* does not require a degree. For this reason, it is necessary to investigate the educational and certification requirements for any job in which you are interested.

A current trend is that on-the-job training, in which individuals learn necessary job skills after being employed, is being replaced in many occupations by formal training. For example, aide-level positions are being assigned more responsibilities, and classroom training is becoming necessary. Today's health care facilities need individuals who have current skills, are able to think for themselves, and can start immediately as contributing members of the health care team.

Standards for Health Care Professionals

Standards for health care professionals have been established to protect the public from potential harm caused by incompetence. Testing, along with various approval and monitoring mechanisms, have been developed to determine whether professionals have met specific standards. The purpose of standards is to ensure that professionals master at least the minimum knowledge and skills necessary to safely and competently practice their professions. Students should be aware that in addition to knowledge and skill standards, some occupations require background checks and drug testing. Individuals who have been convicted of certain crimes are prohibited from taking certification exams or practicing certain occupations.

Standards may be set by state boards or national professional organizations. There are several terms that designate various types of approvals. **Certification** is a general term that means a person has met predetermined standards. The process of becoming certified usually involves completing certain educational requirements and passing a professional examination. Most individuals who work in health care go through a certification process, although their title might not include the term *certified*. Examples of occupations that do include this term in their title are certified occupational therapy assistant, certified medical assistant, and certified nursing assistant.

Some occupations require **registration**, which means being placed on an official list (registry) after meeting the educational and testing requirements for the profession. Professionals who use this term in their title include registered nurse, registered respiratory therapist, and registered medical assistant. (A profession may require registration, but not include that term in the title.)

Licensure is a designation that means the person has been granted permission to legally perform certain acts. Licenses are granted by government agencies, often the state. The specific occupations that require licensure vary from state to state. Some occupations are licensed in most, but not all, states. The word *licensed* does not usually appear with the title of licensed professions. For example, in the following list of licensed professions, only one includes the term: dentist, dental hygienist, physician, registered nurse, and licensed practical/vocational nurse.

The various types of approvals can be confusing. Certification and registration are often, but not always, required to work legally. Even when not required by law, they provide credibility and are preferred by many employers when hiring. Medical assisting is an example of an occupation in which voluntary certification or registration enhances the graduate's chances of being hired. Licensure, if required for a profession, is never voluntary.

Some professions have more than one form of approval. Medical assistants, for example, can be either certified or registered. Both approvals require meeting specific educational requirements and passing a national exam. The American Association of Medical Assistants grants the title "certified." The American Medical Technologists grants the title "registered."

Certification and licensing exams vary by occupation. Some consist of multiple-choice questions that are presented in a computerized format. Others contain case studies and ask questions to test the candidates' knowledge about handling situations that may be encountered on the job. Still others have a practical component that requires candidates to demonstrate their ability to perform certain tasks. In addition to occupational questions, some states test the knowledge of the laws that apply to health care occupations.

Another point that can be confusing is that some professions are licensed but use the title "registered." Nurses take a national exam that, when passed, entitles them to apply for a license in the state where they want to work. They can become licensed in any state as long as they follow the proper application process. In addition, they are listed in a registry. Although "registered nurse" is the title for the occupation, it is also a licensed profession.

Study the contents of Tables 1–8 and 1–9. Note the variety of titles and educational levels within the nursing and occupational therapy careers. As you can see, professional titles and the types of approval granted do not necessarily indicate the level of education achieved. For example, the educational requirements for a certified nursing assistant can be less than 200 hours of instruction; a certified

occupational therapy assistant, however, must earn an associate's degree. The titles given refer to the specific methods chosen by various organizations to ensure that their standards are met, rather than to the educational requirements. Furthermore, some titles may be acquired with varying amounts of education. Using the example of the registered nurse once again, we see that qualifying education can be either an associate's or bachelor's degree.

It is essential that students understand what is necessary for them to work in their chosen occupation. Most examining and licensing boards require attending an accredited school and/or program. The two common accrediting agencies for health care programs are as follows:

1. Commission on Accreditation of Allied Health Education Programs (CAAHEP). Find more information at www.caahep.org
2. Accrediting Bureau of Health Education Schools (ABHES). Find more information at www.abhes.org

Being accredited means that the school and/or program meets the standards set by a specific professional organization. To become accredited, a school or program must formally apply for approval. Once the application is accepted, a team from the organization visits the campus to ensure that all standards are being met. For some careers, such as paramedics, educational programs must be approved by the state. Others, such as occupational therapy assistant, require that programs be approved by the career's professional organization.

In addition to attending an accredited program, students must meet the following requirements before most professional exams can be taken:

- High school diploma or the equivalent
- Completion of specific courses
- Successful completion of the clinical portion of the training
- Not having been convicted of certain crimes

After being obtained, most certifications require specific amounts of continuing education. This is discussed further in Chapter 14. Individuals who fail to maintain the competency and conduct standards for their profession can lose their certification or license. The purpose of health care regulation is not to provide one-time approval. It is an ongoing effort to ensure that only qualified professionals are serving the public.

OCCUPATIONAL PROFILES

The occupations described in this section are organized into four categories:

1. **Therapeutic** and Treatment
2. **Diagnostic**
3. Health Information Management
4. Environmental

Note that there is overlap among the categories. For example, although listed in the therapeutic and treatment section, a major responsibility of dentists and physicians is to diagnose their patients' conditions. And although dietetics is listed in the environmental category, nutrition experts prescribe diets as part of the treatment of health conditions such as diabetes and heart disease.

Occupational titles are further divided into specific career areas, such as dental and mental health. The educational and certification, registration, and/or licensing requirements for various occupational levels are presented in Tables 1–3 through 1–20. (Note that the abbreviations given in the tables for job titles assume that the individual has achieved the required approval, such as certification. For example, RN stands for *registered nurse*.) Along with each table, occupations that generally require associate's degrees or vocational training are described in more detail.

It is important for students to keep in mind that the information in this chapter consists of brief overviews and contains only some of the hundreds of health care jobs available today. (See Box 1–1 for examples of additional occupations.) It is also important to note that there are more rungs on each career ladder than appear in the tables. For example, there are many nurse specialties, such as nurse anesthetist, clinical nurse specialist, and nurse practitioner, as well as doctoral degrees in nursing. Many health care providers earn advanced degrees beyond the basic requirements for their professions.

Job growth projections were taken from the Bureau of Labor Statistics for the period 2016 to 2026. Salaries, however, have not been included for the various occupations because it is difficult to provide accurate, up-to-date

Box 1–1

Examples of Health Care Occupations

Art Therapist
Athletic Trainer
Audiologist
Health Educator
Medical Illustrator
Medical Librarian
Medical Photographer
Medical Writer
Music Therapist
Speech and Language Pathologist

information that applies to all geographic areas, individual facilities, and current economic conditions. Students are encouraged to check the latest statistics provided by the Bureau of Labor to see current median salaries for occupations of interest. The median salary for a dentist means that half of all dentists earn less than that amount and half earn more. Students can also find sources on the Internet to learn about typical salaries in their states. For example, many professional organizations collect and report salary information.

It is also important to note that the education and certification requirements given in tables are subject to change. Students should check with professional organizations and their state's licensing board for the most up-to-date information.

Therapeutic and Treatment Occupations

Therapeutic and treatment occupations provide services that assist patients to regain or attain maximum wellness. They may involve direct patient care, such as nursing, or provide services that contribute to the patient's recovery, such as the pharmacy professions. The majority of health care occupations fall into this category.

Dental Occupations

Dental professionals treat diseases and conditions of the teeth and soft tissues of the mouth. They perform preventive measures, restore missing and defective teeth, diagnose and treat diseases of the gums, perform cosmetic dentistry, and provide patient education. (See Table 1–3.)

Dental Hygienist

The primary responsibility of a dental hygienist is to provide preventive dental care. This is accomplished by cleaning the teeth with special instruments and equipment, examining the mouth and taking X-rays, and providing patient education about dental care. Although hygienists perform their work independently, they are under the supervision of a dentist. Work schedules are often flexible, and many hygienists work part-time and/or for more than one dentist. The work involves prolonged patient contact, standing and reaching, and requires the ability to get along well with others. Good **manual dexterity** (skill working with the hands) and hand–eye coordination are essential. Jobs in dental hygiene are projected to grow by 20% from 2016, much faster than average among all occupations. *See https://www.bls.gov/ooh/healthcare/dental-hygienists.htm*.

Table 1–3 Dental Occupations

Career	Education	Testing and Approval
Dentist (DDS or DMD)	2–4 years college preprofessional education 4 years dental school 2–4 years additional education if seeking specialty	Licensed by states: 1. Graduate from accredited dental school 2. Pass written and practical exams
Dental Hygienist (RDH)	Associate's or bachelor's degree 2–4 years depending on program requirements	Licensed by states: 1. Graduate from accredited dental hygiene school 2. Pass national board exams administered by the American Dental Association Joint Commission on National Dental Examinations 3. Pass state and/or locally administered clinical exams 4. Pass state exam covering dental hygiene law
Dental Assistant (CDA or RDA)	1–2 year educational program (recommended) or on-the-job training	Requirements vary by state; voluntary certifications available through Dental Assisting National Board
Dental Laboratory Technician	On-the-job training or 2-year associate's degree program	Voluntary certification available from National Association of Dental Laboratories and/or National Board for Certification in Dental Laboratory Technology

Dental Assistant

Dental assistants are trained to perform a variety of duties in the dental office. They may work closely with the dentist by preparing patients for treatment, passing instruments, and suctioning the mouth during procedures performed by the dentist. Laboratory duties may include sterilizing and preparing instruments, creating casts of the teeth, and making temporary crowns. Administrative dental assistants greet patients, schedule appointments, keep patient records, send bills, and perform other clerical duties as needed. Dental assistants must have good manual dexterity, the ability and willingness to follow directions, and good interpersonal skills. This occupation is experiencing a 19% job growth, much faster than the average for all occupations. *See https://www.bls.gov/ooh/healthcare/dental-assistants.htm*.

Dental Laboratory Technician

Dental laboratory technicians make the items used by dentists to replace and restore teeth, such as crowns, bridges, and dentures. These are fabricated using models of the patient's mouth and involve working with plaster, wax, metal, and porcelain. Small handheld tools, grinding and polishing equipment, and heat sources for melting and baking are used. The work is precise and very delicate. Successful technicians are patient and steady-handed and have good vision, especially the ability to discriminate colors, needed for matching replacements to remaining teeth. Growth in the number of jobs is expected to be 13%, higher than average for all occupations. *See https://www.bls.gov/ooh/production/dental-and-ophthalmic-laboratory-technicians-and-medical-appliance-technicians.htm*.

Emergency Medical Occupations

Emergency medical technicians provide quick response service to victims of medical emergencies. All EMTs are qualified to give life support and immediate care such as restoring breathing, controlling bleeding, administering oxygen, bandaging wounds, and treating a person for shock. EMTs transport victims to health care facilities and provide necessary care en route. Intermediate EMTs have additional skills that include administering fluids intravenously and using a defibrillator to administer an electrical shock to a person whose heart has stopped. Paramedics, the highest level EMTs, are qualified to administer drugs, interpret electrocardiograms (measurements of the heart's electrical activity), and perform various invasive procedures (involving puncture or insertion of an instrument or material into the body). EMTs must be emotionally stable, able to deal calmly with stressful situations, physically coordinated, able to move quickly and easily, and able to lift and carry heavy loads. EMTs are employed by rescue squads, police departments, and fire departments, and employment is expected to grow 15% from 2016. (See Table 1–4.) *See https://www.bls.gov/ooh/healthcare/emts-and-paramedics.htm*.

Massage Therapy Occupations

Massage therapists use different types of massage, such as Swedish, deep tissue, and reflexology, to treat ailments and injuries; decompress tired muscles; reduce stress; and promote wellness. There are dozens of specialties, or types of massage, each designed to achieve specific results.

A large percentage of massage therapists are self-employed, with the remainder working in settings ranging from physician and chiropractors' offices to fitness centers to spas. Massage therapy is physically demanding, as it requires standing and repetitive movements. Working with clients requires good communication, empathy, and the ability to make clients feel comfortable with the personal nature of massage treatment. Job growth rate is excellent, projected to be 26%. (See Table 1–5.) *See https://www.bls.gov/ooh/healthcare/massage-therapists.htm*.

Medical Office Occupations

Medical office personnel treat patients who are seeking to maintain or improve their health or who need treatment for illnesses and injuries. Medical offices are staffed by a physician who may be either a medical doctor (MD) or a doctor of osteopathic medicine (DO). MDs and DOs receive similar training and perform similar functions. The major difference is that osteopathic physicians place more emphasis on the musculoskeletal system. Doctors of osteopathy also tend to approach medicine more holistically, meaning that they consider mental and emotional as well as physical health. Physicians may provide general care or they may specialize in what and who they treat. (For a list of medical specialties see Box 1–2.)

In addition to the physician, medical offices need support staff to assist with patient care and to perform clinical, laboratory, and administrative duties. (See Table 1–6.) (Note: Physicians and occupations designated as "medical office support staff" also work in other settings, such as large clinics, hospitals, rehabilitation centers, etc.)

Medical Assistant

Medical assistants must be prepared to carry out a wide variety of duties. They may work closely with the physician and/or perform clinical tasks. Clinical, or "back office assistants'," duties include preparing patients, taking vital signs, helping the physician with exams and procedures, and performing a variety of tests and procedures on patients. Medical assistants may also choose to concentrate on administrative or "front office tasks," which include receiving patients,

Table 1–4 Emergency Medical Occupations

Career	Education	Testing and Certification
Paramedic	Typically 1–2 years; may result in a certificate or associate's degree	Licensed by states: Most states require certification from the National Registry of Emergency Medical Technicians, which includes the following: 1. Complete a state-approved paramedic course that meets or exceeds the U.S. Department of Transportation National Standard Curriculum 2. Pass written and practical exams 3. Pass a state-approved psychomotor exam
EMT-Intermediate/99 EMT-Intermediate/85 Note: Some states have only one level referred to as Advanced EMT	Training requirements vary by state Typically consist of 30–350 hours of training, depending on the scope of practice	Licensed by states: Most states require certification from the National Registry of Emergency Medical Technicians, which includes the following: 1. Complete a state-approved EMT-Intermediate/99 or EMT-Intermediate/85 course that meets or exceeds the U.S. Department of Transportation National Standard Curriculum 2. Pass written and practical exams 3. Pass a state-approved psychomotor exam
EMT-Basic	Training requirements vary by state, typically at least 120 hours over 6 to 15 weeks of training	Licensed by states: Most states require certification from the National Registry of Emergency Medical Technicians, which includes the following: 1. Complete a state-approved EMT-Basic course that meets or exceeds the U.S. Department of Transportation National Standard Curriculum 2. Pass written and practical exams 3. Pass a state-approved psychomotor exam
First Responder/Emergency Medical Responder	Training requirements vary by state	Licensed by states: Most states require certification from the National Registry of Emergency Medical Technicians, which includes the following: 1. Complete a state-approved first-responder course that meets or exceeds the U.S. Department of Transportation National Standard Curriculum 2. Pass written and practical exams 3. Pass a state-approved psychomotor exam

Note: Some states have their own certification programs and different names and titles for emergency service personnel.

Table 1–5 Massage Therapy Occupations

Career	Education	Testing and Certification
Massage Therapist	Requirements vary by state and locality; ranges from 3 to 24 months	Most states regulate and require formal education and national or state licensure or certification. In addition, some cities, towns, and counties have their own regulations and licensing requirements. Certification required for licensure in many states is offered by the National Certification Board for Therapeutic Massage and Bodywork (NCBTMB). Some states also require practical exams.

Box 1–2

Medical Specialists

Physicians who specialize in treating specific parts of the body:

Cardiologist	Heart and blood vessels
Dermatologist	Skin
Endocrinologist	Endocrine system (glands)
Gastroenterologist	Stomach and intestines
Gynecologist	Female reproductive organs
Internist	Internal organs, including the lungs, heart, glands, intestines, and kidneys
Nephrologist	Kidneys
Neurologist	Brain and nervous system
Ophthalmologist	Eyes
Orthopedist	Muscles and bones
Otolaryngologist or Otorhinolaryngologist	Ear, nose, and throat
Proctologist	Lower part of the large intestine
Psychiatrist	Mind
Urologist	Kidneys, bladder, and urinary system

Physicians who perform specific kinds of work:

Anesthesiologist	Administers medication to cause loss of sensation or feeling during surgery
Emergency Physician	Treats acute illnesses and injuries
Oncologist	Diagnoses and treats tumors (cancer)
Pathologist	Diagnoses disease by studying changes in organs, tissues, and cells
Physiatrist	Treats conditions associated with physical medicine and patients in need of rehabilitation
Plastic Surgeon	Performs corrective surgery to repair injured or malformed body parts
Radiologist	Uses X-rays and radiation to diagnose and treat diseases
Sports Medicine Physician	Prevents and treats injuries sustained in athletic events and physical activities
Surgeon	Performs surgery to correct deformities and treat injuries and diseases
Thoracic Surgeon	Performs surgery on the lungs, heart, and chest cavity

(continues)

Box 1–2

Physicians who work with specific populations:

Family Practice Physician	Promotes wellness and treats individuals in all age groups
Gerontologist	Promotes wellness and treats older persons
Obstetrician	Assists women with pregnancy and childbirth
Pediatrician	Promotes wellness and treats children

Table 1–6 Medical Office Occupations

Career	Education	Testing and Certification
Physician (MD, DO)	4 years college preprofessional education 4 years medical school MD: 3–8 years of graduate medical education (internship and residency) DO: 1-year internship and a 2- to 6-year residency	Licensed by states: 1. Graduate from accredited medical school 2. Complete graduate medical education 3. Pass written examination
Physician's Assistant (PA)	Varies. 2–4 years college + 24-month (minimum) PA program	Requirements vary by state; most require passing the exam administered by National Commission on Certification of Physician's Assistants
Medical Assistant Administrative and/or Clinical (MA, CMA, RMA) Certified Medical Assistant (CMA) Registered Medical Assistant (RMA)	Certificate program or associate's degree	Specific tasks, such as giving injections, regulated by some states. Optional certification through exam administered by the American Association of Medical Assistants. Optional registration through exam administered by the American Medical Technologists

answering the telephone, maintaining patient records, and handling insurance and billing duties. In small offices, the medical assistant may have both front and back office assignments. Medical assistants must be able to follow directions, work accurately, get along well with others, and have good manual dexterity. The occupation is expected to grow much faster than average for all occupations at 29%. *See https://www.bls.gov/ooh/healthcare/medical-assistants.htm.*

Mental Health Occupations

Mental health professionals provide care, treatment, counseling, and activities for patients with mental, emotional, and/or psychosocial (combination of mental and social) problems. These services are provided for patients in a wide variety of settings, including medical offices dedicated to the practice of psychiatry, psychiatric hospitals, halfway houses, general hospitals, clinics dedicated to treating substance abuse problems, group homes, and prisons. Diagnoses encountered range from mild anxiety disorders, in which patients experience temporary feelings of distress, to serious conditions, such as schizophrenia, that result in behaviors that are unsafe for both the patient and the public. (See Table 1–7.)

Psychiatric/Mental Health Technician

Mental health technicians work with patients under the direction of a psychiatrist, a psychologist, or a registered nurse. They carry out care plans, assist with group activities, listen to patients and provide encouragement, and note behavior. The work requires a strong desire to help others, patience, understanding, excellent oral communication skills, and emotional stability. Employment growth is expected to be 6%, about average for all occupations. *See https://www.bls.gov/ooh/healthcare/psychiatric-technicians-and-aides.htm.*

Table 1–7 Mental Health Occupations

Career	Education	Testing and Certification
Psychiatrist (MD)	4 years college preprofessional education 4 years medical school 4–7 years of medical graduate education (internship and residency)	Licensed by states: 1. Graduate from accredited medical school 2. Complete specialized studies, internship, and residency 3. Pass written exam
Clinical Psychologist (PhD, PsyD)	4 years college 2–3 years graduate school (master's degree) Additional 3+ years (doctorate)	Licensed by states: Pass written exam
Clinical Social Worker	4 years college 2–3 years graduate school, including supervised experience (master's degree)	Licensed by states: Pass written exam
Psychiatric Clinical Nurse Specialist	Licensure as RN 2–3+ years graduate school (master's or doctoral degree)	Licensed by states: 1. Requirements vary by state but include passing a written exam
Mental Health Technician	Certificate or associate's degree in human services or mental health preferred	Licensed by some states
Psychiatric Aide	Some states require formal training program	Varies by state

Psychiatric Aide

Psychiatric aides assist other health care professionals and provide help with the physical needs of patients, such as hygiene and feeding. They provide companionship for patients and may help escort patients within or outside the care facility. Aides must be patient, caring, and responsible. (Note: Psychiatric aides generally have less formal education than mental health technicians. In some states, however, the two job titles refer to the same level of education and work duties.) Job growth is about the same as for mental health technicians at 6%. *See https://www.bls.gov/ooh/healthcare/psychiatric-technicians-and-aides.htm*.

Nursing Occupations

Nurses promote health and provide care and treatment for patients with all types of health problems. Nursing care is carried out through the application of a structured process to determine each patient's needs, develop individual care plans, implement the plans, and then evaluate their effectiveness. An important responsibility of the nurse is to provide education to patients and their families regarding self-care and health maintenance. (See Table 1–8.)

Registered Nurse

Registered nurses provide a wide variety of patient care services. They give direct patient care or supervise other personnel who do so, serve as patient advocates (support the interests of patients), and provide patient education. They are often the professionals who coordinate the overall care of patients by interacting with all other health care professionals involved. Registered nurses can achieve many educational levels and pursue a great number of specialties. Opportunities range from direct patient care to management of a hospital department. Specific day-to-day activities are determined by the work setting, which may be a hospital, clinic, long-term care facility, school, prison, or patients' homes. Registered nurses must be caring and responsible, have excellent assessment and communication skills, and be emotionally stable and able to both follow orders and supervise others. Registered nursing is one of the most versatile careers in any field. It is one of the occupations projected to have the largest number of job openings during the period 2016 to 2026. In fact, some areas of the United States are reporting shortages of qualified registered nurses. *See https://www.bls.gov/ooh/healthcare/registered-nurses.htm*. (See Figure 1–5.)

Table 1–8 Nursing Occupations

Career	Education	Testing and Certification
Certified Registered Nurse Anesthetist (CRNA)	Be a registered nurse Complete specialized education leading to a master's degree	Licensed by states: Pass a national certification exam
Nurse Practitioner (CRNP)	Be a registered nurse Complete additional educational and clinical practice requirements (most are master's or doctoral degree programs)	Licensed by states: Pass a national certification exam
Registered Nurse (RN)	4-year (bachelor's) college degree (preferred by most and required by many hospitals) or 2-year (associate's) degree	Licensed by states: 1. Graduate from approved program 2. Pass the National Council Licensing Examination for Nurses (N-CLEX)
Licensed Practical/Licensed Vocational Nurse (LPN/LVN)	1- or 2-year state-approved associate's degree or diploma program	Licensed by states: 1. Graduate from approved program 2. Pass national licensing exam
Certified Nursing Assistant (CNA)	States have various training requirements for classroom and clinical experience Programs must meet specific federal minimum standards Typical program is at least 8 weeks	All states require certification for work in long-term care facilities Requirements guided by federal regulations established by the Omnibus Budget Reconciliation Act of 1987 (OBRA) Certification requirements vary for other work environments
Patient Care Technician/Patient Care Assistant	Vocational training program	Certification required if nursing assistant duties are included. Voluntary certifications available: 1. National Health Association 2. National Center for Competency Testing
Home Health Aide	States have various training requirements for classroom and clinical experience. Some types of employers require formal training.	Approval requirements vary by state under guidance of OBRA Voluntary certification available from the National Association for Home Care and Hospice

Licensed Practical/Vocational Nurse

Licensed practical nurses (known as licensed vocational nurses in California and Texas) provide basic patient care under the direction of physicians and registered nurses. Most practical nurses carry out bedside tasks that include taking vital signs, administering medications, applying dressings and hot and cold packs, treating bedsores, and giving various comfort measures. They are also responsible for recording patient information. Practical nurses must be caring, responsible, emotionally stable, and able to follow directions and work under supervision. Job opportunities vary by region. Most new jobs are in residential care facilities and home health environments. Employment growth is expected to be faster than average for all occupations at 12%. *See https://www.bls.gov/ooh/healthcare/licensed-practical-and-licensed-vocational-nurses.htm.*

Certified Nursing Assistant

Nursing assistants work under the supervision of nursing staff to help care for patients' basic needs. They may take vital signs, assist patients with hygiene and feeding, give comfort measures, change bedding, and help transport

FIGURE 1–5 As older nurses retire, there will be a great need for newly trained registered nurses.

FIGURE 1–6 Home health aide is a fast-growing occupation. Aides must be compassionate, patient, and interested in helping older adults and people with disabilities.

patients. The variety and level of duties depend on state laws, the amount of training, and the needs of the facility. Assistants must be patient, caring, dependable, and able to follow directions. This is a fast-growing occupation, with an expected increase of 18%. This is especially true for individuals who are also qualified to work as home health aides. *See https://www.bls.gov/ooh/healthcare/nursing-assistants.htm*.

Patient Care Technician

The work of patient care technicians is similar to that of nursing assistants. They work under the supervision of physicians or nurses, taking vital signs, collecting specimens, and assisting patients with eating, hygiene, and grooming. Patient care technicians work in hospitals, clinics, and rehabilitation facilities. *See https://www.bls.gov/ooh/healthcare/nursing-assistants.htm*.

Home Health Aide

Home health aides help people with disabilities, older adults, and the chronically ill. Their work is similar to that of certified nursing assistants. In fact, many home health aides have nursing assistant certification. They may work in patients' homes or in a care facility, assisting with moving patients, providing personal care, and dressing. In the client's home, duties may include preparing meals, providing companionship, doing light housekeeping, and providing transportation. In some states, with the proper training and under the supervision of a nurse, they are allowed to give medications to clients, take vital signs, and assist patients with prescribed exercises. This is one of the fastest growing of all occupations, at 47%. (See Figure 1–6.) *See https://www.bls.gov/ooh/healthcare/home-health-aides-and-personal-care-aides.htm*.

Personal Care Aide

Personal care aides help residents and patients with daily tasks such as bathing, grooming, dressing, and eating. They cannot perform medically related tasks, such as giving medications. Because of the aging population, this is one of the fastest growing of all occupations, projected to be 39%. *See https://www.bls.gov/ooh/healthcare/home-health-aides-and-personal-care-aides.htm*.

Occupational Therapy Occupations

The purpose of occupational therapy is to help individuals attain the highest level of function and self-sufficiency possible. Difficulties in performing the activities of daily living can be the result of physical, mental, or emotional problems caused by disease, injury, or congenital (present at birth) conditions. Occupational therapists evaluate patients, set goals to increase their function and lessen their limitations, and create treatment plans to achieve these goals. Treatment may involve individual or group activities, exercise, providing adaptive equipment such as splints and special tools, and teaching patients new ways to perform daily tasks. Job growth rate for occupational therapists is projected at 24%, much faster than other occupations. (See Table 1–9.)

Occupational Therapy Assistant

Occupational therapy assistants work under the supervision of occupational therapists. They carry out rehabilitative activities and exercises prescribed in treatment plans prepared by occupational therapists. Other important duties include patient education, monitoring patient progress, and preparing reports for the therapist. Typical tasks include teaching a patient to use special devices that enable the performance of everyday tasks, such as reaching, dressing, and cooking; assisting with a stretching exercise; and making a hand splint. Occupational therapy assistants must have good communication skills, be patient and caring, and be sensitive to the needs of people who suffer from a variety of disabilities. The number of new positions is expected to grow rapidly at 29%. *See https://www.bls.gov/ooh/healthcare/occupational-therapy-assistants-and-aides.htm*.

Table 1–9 Occupational Therapy Occupations

Career	Education	Testing and Licensure
Occupational Therapist (OTR)	Master's degree (minimum) or doctorate	Licensed in all states National registration: 1. Graduate from program accredited by the American Occupational Therapy Association (AOTA) 2. Pass national exam administered by National Board for Certification in Occupational Therapy (NBCOT)
Occupational Therapy Assistant (COTA)	2-year (associate's) college degree	Licensure or certification required in most states National certification: 1. Graduate from program accredited by AOTA 2. Pass national exam administered by NBCOT
Occupational Therapy Aide	Certificate program or on-the-job training	None

Occupational Therapy Aide

Aides help therapists and assistants by performing supportive duties such as preparing supplies for activities, assisting with patient transfers, helping with patient treatments and activities, and cleaning activity areas. Some aides are cross-trained to assist other rehabilitation professionals such as physical therapists. Rehabilitation skills may be combined with nursing assistance training and certification. Aides must be responsible and able to follow directions. For aides who are also certified nursing assistants, the number of positions is expected to grow rapidly. *See https://www.bls.gov/ooh/healthcare/occupational-therapy-assistants-and-aides.htm.*

Pharmacy Occupations

Pharmacy professionals prepare and dispense medications to promote patient wellness and recovery, as well as pharmaceutical products used to diagnose health conditions. Important duties also include educating patients about the proper use of medications and ensuring that patients are not given drugs that will cause harm because of allergic reactions or negative interactions with other drugs. (See Table 1–10.)

Pharmacy Technician

Pharmacy technicians work under the supervision of a licensed pharmacist. They fill orders for drugs, stock medication carts, record and store incoming drug supplies, and reorder inventory as needed. They also assist in maintaining paperwork and records required for controlled drugs (drugs that have potential for abuse). Pharmacy technicians must be responsible, detail oriented, and able to follow directions exactly. Job opportunities are expected to grow faster than average for all occupations, at 12% especially for technicians who are certified. *See https://www.bls.gov/ooh/healthcare/pharmacy-technicians.htm.*

Physical Therapy Occupations

The purpose of physical therapy is to help patients improve their physical functions by increasing muscle strength, range of motion, movement, and by decreasing pain. This is accomplished through assessment and the creation and implementation of treatment programs that may include exercise, massage, and the use of modalities such as heat, cold, and electrical stimulation. Physical therapists teach patients to perform exercises and use equipment, such as canes and crutches. (See Table 1–11 and Figure 1–7.)

Physical Therapist Assistant

Assistants work with patients under the supervision of a physical therapist to carry out treatment plans. They teach and supervise exercises, apply modalities, perform massages, assist patients with ambulatory devices such as walkers and canes, and document progress. Physical therapist assistants must be patient and encouraging and have the physical strength to assist patients with exercises. This occupation is projected to be among the fastest growing in the next several years at 29%. *See https://www.bls.gov/ooh/healthcare/physical-therapist-assistants-and-aides.htm.*

Physical Therapist Aide

Aides support the work of therapists and assistants by preparing and cleaning equipment and therapy areas, assisting with treatments, transporting patients, and ordering and maintaining supplies. Aides must be responsible and

Table 1–10 Pharmacy Occupations

Career	Education	Testing and Licensure
Pharmacist (PharmD)	2–3 years college 3–4 years pharmacy school (doctoral degree)	Licensed by states: 1. Graduate from college of pharmacy accredited by the American Council on Pharmaceutical Education 2. Pass the North American Pharmacist Licensure Exam (NAPLEX) 3. Most states also require passing the Multistate Pharmacy Jurisprudence Exam (MPJE) (Pharmacy law)
Pharmacy Technician	Up to 1 year on-the-job-training or 1- or 2-year college certificate program or associate's degree	A few states require licensure, certification, or registration Voluntary national certification available through examination administered by Pharmacy Technician Certification Board and the Institute for Certification of Pharmacy Technicians
Pharmacy Aide/Helper/Clerk	High school diploma and on-the-job-training or vocational training program	None

Table 1–11 Physical Therapy Occupations

Career	Education	Testing and Licensure
Physical Therapist (PT)	3–4 four years college (bachelor's degree) 3+ years graduate studies (doctorate)	Licensed by states: 1. Graduate from program accredited by the Commission on Accreditation in Physical Therapy Education (CAPTE) 2. Pass exam administered by the Federation of State Boards of Physical Therapy
Physical Therapist Assistant (PTA)	2-year (associate's) college degree	All states require licensure, certification, and/or registration: 1. Graduate from program accredited by CAPTE 2. Pass exam administered by the Federation of State Boards of Physical Therapy
Physical Therapist Aide	On-the-job-training or vocational training program	None

able to follow directions. Job growth is expected to be much faster than average. *See https://www.bls.gov/ooh/healthcare/physical-therapist-assistants-and-aides.htm.*

Respiratory Therapy Occupations

Respiratory therapy involves evaluating, treating, and caring for patients with breathing disorders. Respiratory therapists assist patients who have difficulty breathing or cannot breathe on their own because of conditions such as heart disease, acute diseases (lasting a short time but are relatively severe) such as pneumonia, or chronic diseases (lasting a long time) such as emphysema. (See Table 1–12 and Figure 1–8.)

Respiratory Therapist

Respiratory therapists perform a variety of tasks to assist patients with breathing. These include using special instruments to measure lung capacity and drawing blood

FIGURE 1–7 Physical therapist assistants help patients improve their physical function after accidents, surgery, and illness.

samples to test for levels of oxygen and other components. Therapists provide patients with oxygen and connect those who cannot breathe on their own to ventilators. The monitoring and maintenance of equipment are critical to a patient's well-being. Therapists also administer aerosol medications and perform chest physiotherapy, which involves thumping and vibrating the patient's chest cavity to remove mucus from the lungs. Respiratory therapists must have good technical aptitude and be attentive to detail and able to work under stress. Jobs are expected to grow much faster than average for all occupations at 23%. *See https://www.bls.gov/ooh/healthcare/respiratory-therapists.htm*.

Surgical Occupations

Surgical procedures vary from minor to extremely complex and from emergency to elective. The types of surgery available and their complexity are growing at a fast rate.

FIGURE 1–8 Respiratory therapists administer medications and treatments to patients who have lung and heart disorders.

Many people are alive today as a result of modern surgery. Surgical occupations involve the care of the patient before, during, and after surgery. (See Table 1–13 and Figure 1–9.)

Surgical Technologist/Surgical Technician/ Operating Room Technician

The health care professionals who are trained to perform important functions in the operating room may work under a variety of job titles. Duties include sterilizing and setting up instruments, preparing equipment and linens in the operating room, and preparing patients for surgery and transporting them to the operating room. During surgery, technicians may perform a variety of tasks: pass instruments to the surgeon, hold retractors (instruments that open or draw back tissue, bone, etc.), cut sutures, operate lights and equipment, and assist with the preparation of specimens. Work in surgery requires excellent manual dexterity, attention to detail, the stamina to stand for long hours, and the ability to respond quickly. Employment is expected to grow faster than average for all occupations at 12%. *See https://www.bls.gov/ooh/healthcare/surgical-technologists.htm*.

Table 1–12 Respiratory Therapy Occupations

Career	Education	Testing and Licensure
Respiratory Therapist (RRT, CRT)	Associate's or bachelor's degree	Licensed in all states except Alaska: 1. Graduate an accredited program (accepted approval agencies vary by state) 2. Pass exam administered by the National Board for Respiratory Care

Table 1–13 Surgical Occupations

Career	Education	Testing and Licensure
Surgeon (MD or DO)	4 years college preprofessional education 4 years medical school MD: Up to 6 years of graduate medical education (internship and residency) DO: 1-year internship and 3- to 5-year residency	Licensed by states: 1. Graduate from accredited medical school 2. Complete specialized studies, internship, and residency 3. Pass written exam
Surgical Physician Assistant	Varies; 4 years college (bachelor's degree) + 2-year PA program + 2-year surgical assistant master's degree program	State licensing requirements vary Must pass exams administered by the National Commission on Certification of Physician's Assistants
Certified Surgical Technician (CST), Operating Room Technician (ORT), Surgical Technologist	9-month to 2-year program leading to certificate or associate's degree Clinical experience	Some states require certification or registration by passing exam administered by National Board of Surgical Technology and Surgical Assisting

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FIGURE 1–9 Surgical technologists prepare patients for surgery, set up instruments and supplies, and assist during surgery by passing instruments and supplies.

Veterinary Occupations

Veterinary professionals provide medical treatment and preventive care for many types of animals who fill a variety of roles: pets; food sources for humans; entertainment, such as zoo animals and racehorses; and animals used in laboratory experiments. Pet care has become a multibillion dollar industry in the United States as more people acquire pets as companions and consider them to be members of the family. Although most veterinary practices work with small animals, some work with livestock and other large animals. Others specialize in more exotic animals such as alpacas, ostriches, and lizards. Keeping livestock healthy contributes to human health by ensuring the health and safety of our meat, egg, and milk supply. (See Table 1–14 and Figure 1–10.)

Veterinary Technologists and Technicians

Veterinary technologists and technicians work under the supervision of a veterinarian in diagnosing and treating animals. Their duties are similar and include conducting laboratory tests, taking blood samples and X-rays, cleaning an animal's teeth, assisting in surgery, and educating animal owners. Individuals who work in veterinary careers must like animals and enjoy working with them. The work can be physically and emotionally demanding, as when large animals must be restrained or beloved pets are euthanized. Technologists and technicians must be able to work responsibly under supervision, communicate well, and demonstrate empathy for the owners of the animals they treat. The most common employment settings include private veterinary clinics, animal hospitals, and research facilities. These are expected to be very fast-growing occupations at 20%. *See https://www.bls.gov/ooh/healthcare/veterinary-technologists-and-technicians.htm.*

Vision Care Occupations

Vision care professionals perform the important work of assisting the up to 75% of Americans who use some form of corrective lens. In addition to working to correct vision problems, they identify and treat diseases of the eye, perform surgery, provide education and care to maintain good vision and eye health, and make eyeglasses. (See Table 1–15.)

Table 1–14 Veterinary Occupations

Career	Education	Testing and Licensure
Veterinarian (DVM or VMD)	3–4 years college preprofessional education 4 years veterinary college 2- to 5-year internship/residency required for specialties	Licensed by states: 1. Graduate from accredited veterinary school 2. Pass the North American Veterinary Licensing Exam (NAVLE) 3. Many states administer exam covering state laws and regulations
Veterinary Technologist	Bachelor's degree	Regulation varies by state All states require credentialing exam. Most use National Veterinary Technician (NVT) exam Voluntary certification for work in research facility is administered by the American Association for Laboratory Animal Science
Veterinary Technician	2-year associate's degree	Regulation differs by state Almost all states require credentialing exam Most use NVT exam Voluntary certification for work in research facility is administered by the American Association for Laboratory Animal Science
Veterinary Assistant	On-the-job training or college certificate program	No licensing required

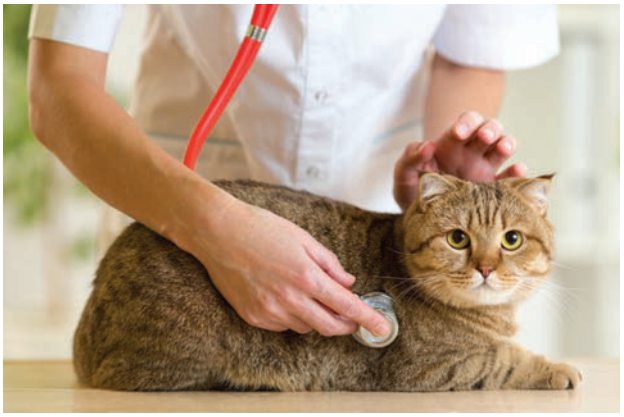

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FIGURE 1–10 Veterinary technologists and technicians assist veterinarians as they diagnose and treat various types of animals.

Ophthalmic Medical Technician

Ophthalmic medical technicians assist ophthalmologists in their work with patients. They take care of equipment, record patient histories, perform eye tests, assist with surgery, and carry out office maintenance duties. Good manual dexterity, observation skills, and attention to detail are important characteristics for success in this occupation. Job growth is expected to be very good at 25%. *See https://www.bls.gov/oes/2017/may/oes292057.htm.*

Ophthalmic Laboratory Technician

Ophthalmic laboratory technicians make eyeglass lenses following prescriptions prepared by ophthalmologists and optometrists. They use special equipment to cut, grind, edge, and finish eyeglass lenses, which must then be checked for accuracy. The job sometimes includes inserting lenses into frames. Technicians must have good manual dexterity, attention to detail, and the ability to follow directions. Job growth is expected to be 13%, although the number working in this occupation is low. *See https://www.bls.gov/oes/2017/may/oes519083.htm* and *https://www.bls.gov/ooh/production/dental-and-ophthalmic-laboratory-technicians-and-medical-appliance-technicians.htm.*

Diagnostic Occupations

Professionals in diagnostic occupations help identify and/or determine the causes and extent of diseases and injuries so that proper treatment can be planned. They also monitor patient progress over time to determine if treatment is effective. Occupations may involve working directly with patients to perform tests and collect specimens, operating complex equipment, and carrying out tests in a laboratory setting.

Table 1–15 Vision Care Occupations

Career	Education	Testing and Licensure
Ophthalmologist (MD)	4 years college preprofessional education 4 years medical school 4–7 years graduate medical education (internship and residency)	Licensed by states: 1. Graduate from accredited medical school 2. Complete specialized studies, internship, and residency 3. Pass written exam
Optometrist (OD)	3–4 years college 4 years college of optometry 2+ years residency required to specialize in specific types of optometry	Licensed by states: 1. Graduate from accredited optometry school 2. Pass written and clinical state board exams or exam administered by National Board of Examiners in Optometry 3. Many states require exam on state law
Ophthalmic Medical Technologist	Associate's or bachelor's degree	Requirements vary among states Voluntary certification from the Joint Commission on Allied Health Personnel in Ophthalmology (JCAHPO)
Ophthalmic Technician	1-year certificate or diploma program	Requirements vary among states Voluntary certification from the JCAHPO
Optician	On-the-job training or 2- to 4-year apprenticeship or vocational or associate's degree program (apprenticeship means formal on-the-job training with specific conditions and goals). Some states require formal training to qualify to take certification exams.	Licensed or certified in 22 states; requirements vary Voluntary certification available through the American Board of Opticianry and National Contact Lens Examiners
Ophthalmic Assistant	On-the-job training or formal education ranging from 2 weeks to 2-year associate's degree	Optional certification: 1. Complete educational program 2. Clinical experience 3. Pass national exam administered by JCAHPO
Ophthalmic Laboratory Technician	On-the-job training or 6- to 12-month vocational training program	Voluntary certification available from the American Board of Opticianry and National Contact Lens Examiners: 1. Possess high school diploma 2. Pass examination
Optometric Assistant/ Technician	On-the-job training or vocational program	Voluntary certification available from the American Optometric Association, Commission on Paraoptometric Certification

Diagnostic Imaging Occupations

Diagnostic imaging involves the use of a variety of techniques and machines to view structures and functions inside the body. Many diseases and injuries can be diagnosed without carrying out invasive procedures. Equipment is used that employs X-rays, sound waves, magnetic fields, and radioactive substances. (See Chapter 18 for more information on imaging techniques.) The ongoing development of noninvasive diagnostic methods has resulted in new specialties and occupational areas, such as magnetic resonance imaging (MRI) technologist. (See Table 1–16.)

Radiologic Technologist/Radiographer

Radiographers perform X-ray procedures. They explain procedures to patients, position them properly, provide shielding against excessive exposure to X-rays, operate equipment, and develop film. This work requires great attention to safety factors, a high degree of technical aptitude, the ability to communicate well with patients, the stamina to stand for long periods, and the ability to work under emergency conditions. Faster than average employment growth is expected at 12%. Radiographers who learn a variety of specialties, such as skull X-rays and mammography, will have the best chances for employment. *See https://www.bls.gov/ooh/healthcare/radiologic-technologists.htm.*

Diagnostic Medical Sonographer

Sonographers operate equipment that uses sound waves (ultrasound) to produce images of soft tissue. This technology allows the movement of internal structures to be viewed on a screen, as well as the creation of images on film. Sonographers can specialize in cardiac, vascular, or

Table 1–16 Diagnostic Imaging Occupations

Career	Education	Testing and Licensure
Radiologist (MD or OD)	4 years college preprofessional education 4 years medical school 5–7 years of graduate medical education (internship and residency)	Licensed by states: 1. Graduate from accredited medical school 2. Complete specialized studies, internship, and residency 3. Pass written exam administered by the American Board of Radiology
Registered Radiologic Assistant	Bachelor's degree	Licensed in most states Voluntary registration from the American Registry of Radiologic Technologists (ARRT): 1. Graduate from accredited program or meet other specified requirements 2. Pass certification exam
Radiologic Technologist (RT)/Radiographer	Associate's or bachelor's degree	Licensed in most states Voluntary registration from ARRT: 1. Graduate from accredited program or meet other specified requirements 2. Pass certification exam
Computed Tomography Technologist	Associate's or bachelor's degree plus on-the-job training or training from manufacturer	Same as radiographer plus additional specialty exam
Magnetic Resonance Technologist	Be a registered radiographer Associate's or bachelor's degree plus on-the-job training or training from manufacturer	Same as radiographer plus additional specialty exam
Positron Emission Tomography Technologist	Be a registered radiographer Associate's or bachelor's degree plus on-the-job training or training from manufacturer	Same as radiographer plus additional specialty exam

(continues)

Table 1–16 Diagnostic Imaging Occupations *(continued)*

Career	Education	Testing and Licensure
Diagnostic Medical Sonographer	Certificate program or associate's or bachelor's degree (associate's degree most common)	Some states require licensure Voluntary certification available from the American Registry of Diagnostic Medical Sonographers (ARDMS): 1. Graduate from accredited program or meet other requirements 2. Pass national exam
Limited X-ray Machine Operator	Diploma or certificate program	Certification and title of position vary by state. Most states (32 currently) require licensure. Some require specific education from an accredited program and passing a certification exam
Cardiovascular Technologist/Diagnostic Vascular Technologist	Associate's or bachelor's degree	Some states require licensure Registration available with ARDMS Certification available from Cardiovascular Credentialing International
Electrocardiography Technician	On-the-job training or 6- to 12-month vocational education program	Certification available from the National Center for Competency Testing and the National Healthcareer Association
Neurodiagnostic Technologist/ Electroneurodiagnostic Technologist/ Electroencephalographic Technologist	Associate's degree (preferred) or formal training program of 1–2 years leading to a diploma or on-the-job training	Some states require certification Certification available from the American Board of Registration of Electroencephalographic and Evoked Potential Technologists

abdominal areas. A common use of ultrasound, because of its safety, is to observe the developing fetus. Sonographers must have good math and technical aptitude, the ability to communicate with patients, and accurate work habits. Employment growth is expected to be faster than for all occupations at 17%. *See https://www.bls.gov/ooh/healthcare/diagnostic-medical-sonographers.htm*.

Limited X-ray Machine Operator

Limited X-ray machine operators are licensed personnel whose duties are similar to those of a radiologic technologist, but more limited in scope. This position does not exist in all states and may have another title, such as radiologic technician or radiographic assistant.

Cardiovascular Technologist and Diagnostic Vascular Technologist

Cardiovascular and diagnostic vascular technologists assist physicians in the diagnosis and treatment of heart, vein, and artery disorders. They are qualified to perform noninvasive tests using ultrasound as well as to assist with invasive procedures, such as cardiac catheterization, which is the insertion of a small tube through the blood vessels to the heart. Technologists prepare patients for procedures and monitor them throughout. They must work accurately, handle stress well, and have high technical aptitude. Employment growth is expected to be much faster than average at 17%, but the number of positions is not high because the occupation is small. *See https://www.bls.gov/ooh/healthcare/diagnostic-medical-sonographers.htm*.

Electrocardiography Technician

Electrocardiography records the electrical action of the heart. The electrocardiograph (ECG) technician attaches electrodes to specific points on the patient and manipulates switches on a machine to trace the electrical activity on graph paper. This skill is often included in the training of other patient care occupations, such as medical assisting. The number of jobs for ECG technicians who are not

trained to perform other tasks in addition to this specialty is expected to grow at a slower-than-average rate.

Neurodiagnostic Technologist/ Electroneurodiagnostic Technologist/ Electroencephalographic Technologist

Electroneurodiagnostics is the monitoring, recording, interpreting, and study of the entire nervous system using various tests and instruments. Electroencephalic technology refers specifically to the recording and study of the brain's electrical activity. Technologists take patient histories, apply electrodes to the scalp, operate recording and monitoring instruments, and monitor patients during procedures. They should have good manual dexterity and vision, technical aptitude, and excellent communication skills.

Medical Laboratory Occupations

Work in medical laboratory occupations involves collecting and studying specimens from the human body. These include blood and other body fluids, tissues, and cells. Many kinds of tests are available to detect the presence of disease and determine its cause. The work requires the use of specialized equipment, such as microscopes and cell counters, and various chemicals. (See Table 1–17 and Figure 1–11.)

Table 1–17 Medical Laboratory Occupations

Career	Education	Testing and Licensure
Pathologist (MD)	4 years college preprofessional education 4 years medical school 4 years of graduate medical education (internship and residency); 1 or 2 more years required for specialties	Licensed by states: 1. Graduate from accredited medical school 2. Complete specialized studies, internship, and residency 3. Pass written exam
Medical Laboratory Technologist (MT)	Bachelor's or master's degree	Licensed or registered in some states Certification available from: 1. American Medical Technologists 2. Board of Registry of the American Society for Clinical Pathology 3. Board of Registry of the American Association of Bioanalysts
Medical Laboratory Technician	Completion of certificate program or associate's degree	Licensing or registration required in some states Certification available from: 1. American Medical Technologists 2. Board of Certification of the American Society for Clinical Pathology
Medical Laboratory Assistant	1- to 2-year training program or specific work experience	Voluntary certification from the American Medical Technologists Association
Phlebotomist	On-the-job training or formal training program	Licensure required in California, Louisiana, Nevada, and Washington. (It is expected that more states will require in the future.) Certification is required by most employers and is available from: 1. National Phlebotomy Association 2. American Society for Clinical Pathology 3. Association of Phlebotomy Technicians 4. Several other organizations also test and certify phlebotomists

Note: All of the previously mentioned careers require completion of various amounts of training in order to take professional exams.

FIGURE 1–11 Medical laboratory workers perform manual and computerized tests to detect the presence of disease.

Medical Laboratory Technologists and Technicians

Laboratory technologists and technicians perform routine tests, which can require preparing slides, counting cells, and using sophisticated equipment. The work can also involve caring for and cleaning the equipment, maintaining supplies, and keeping records. Laboratory technicians must have good manual dexterity, great attention to detail and accuracy, and good observation skills. Employment projection is expected to be faster than for all occupations at 13%. *See https://www.bls.gov/ooh/healthcare/medical-and-clinical-laboratory-technologists-and-technicians.htm.*

Medical Laboratory Assistant

Laboratory assistants perform routine tests and tasks that are less complex than those for which technologists and technicians are qualified. The necessary qualities and job outlook are similar to those of the technician. *See https://www.bls.gov/ooh/healthcare/medical-and-clinical-laboratory-technologists-and-technicians.htm.*

Phlebotomist

Phlebotomists draw blood from patients for medical testing and from blood donors. In addition to good manual dexterity, they must be calm and reassuring and able to work with individuals who fear blood and needles. Employment growth is expected to be much faster than for all occupations at 25%. *See https://www.bls.gov/ooh/healthcare/phlebotomists.htm.*

Health Information Management Occupations

Individuals who work in health information management occupations gather, analyze, organize, store, and document patient information. Consistent patient care, as well as regulatory compliance, and insurance requirements, depend on complete and accurate records. The increasing emphasis on monitoring the cost of health care delivery and the outcomes of patients who undergo treatment has increased the need for high-quality medical recordkeeping, with employment projections indicating much faster growth than average for all occupations. (See Table 1–18 and Figure 1–12.)

Table 1–18 Health Information Management Occupations

Career	Education	Testing and Licensure
Registered Health Information Administrator (RHIA)	Bachelor's or master's degree	Voluntary registration available from the American Health Information Management Association (AHIMA): 1. Complete educational program approved by the Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM) 2. Pass national exam administered by AHIMA
Registered Health Information Technician (RHIT)	Associate's degree	Voluntary registration available from AHIMA: 1. Complete educational program accredited by CAHIIM 2. Pass national exam administered by AHIMA
Medical Transcriptionist (MT)	Certificate program or associate's degree	Voluntary certification available from Association for Healthcare Documentation Integrity

(continues)

Table 1–18 Health Information Management Occupations *(continued)*

Career	Education	Testing and Licensure
Certified Coding Specialist (CCS)	Associate's degree (preferred) or on-the-job training or coding seminars	Voluntary certification (Certified Coding Specialist [CCS]) available from AHIMA: 1. High-school diploma 2. Complete educational program accredited by CAHIIM 3. Written exam
Medical Records Clerk	On-the-job training	None

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FIGURE 1–12 Health information management professionals must have good computer skills and work accurately.

Registered Health Information Technician

Health information technicians perform a variety of tasks related to the collection and organization of patient data. They organize patient records, perform coding (the assignment of predetermined numbers that designate specific diagnoses and procedures), enter data from paper records into computerized recordkeeping systems, and compile data for reports. Good organizational skills, a high degree of accuracy with details, and good computer aptitude are necessary for success in this field. Job prospects are expected to be very good with an employment growth rate of 13%. *See https://www.bls.gov/ooh/healthcare/medical-records-and-health-information-technicians.htm.*

Medical Transcriptionist

Transcriptionists prepare written medical reports. A variety of reports are used in health care to describe all types of findings and procedures. They include topics ranging from descriptions of surgeries to reports documenting autopsies (examination of organs and tissues performed after death to determine cause of death). Transcriptionists must sit and concentrate for long periods; be able to hear and interpret spoken language that includes medical terms; have excellent grammar, spelling, and computer software skills; and produce consistently accurate work. Employment prospects are expected to decline because of technological advances causing increases in productivity. *See https://www.bls.gov/ooh/healthcare/medical-transcriptionists.htm.*

Certified Coding Specialist

Medical coders classify medical data contained in patient records. Codes are assigned from the two major coding systems, the ICD-10-CM (diagnoses) and CPT (procedures). With experience and additional training, coders can achieve positions such as coding supervisor and compliance officer. A high level of accuracy and attention to detail is necessary for success as a coder. Job prospects are expected to be good. *See https://study.com/articles/Medical_Coding_Specialist_Job_Description_and_Requirements.html.*

Environmental Occupations

Individuals who work in environmental occupations develop and maintain therapeutic environments necessary to support patient care. Responsibilities include providing food services, cleaning and maintaining facilities and equipment, managing resources, and creating pleasant surroundings.

Nutrition and Dietary Service Occupations

Dietary service professionals support patients by planning and providing nutritious foods that are essential to the healing process. Therapeutic diets are sometimes prescribed by physicians for patients with specific health problems and conditions, such as high blood pressure and diabetes, and following abdominal surgery. (See Table 1–19.)

Dietetic Technician

Dietetic technicians work under the supervision of dietitians and perform tasks related to all aspects of food planning and preparation. They assist with creating menus, testing recipes, ordering food and supplies, and preparing meals. Some technicians work with patients to learn their food preferences and design special diets as ordered by a physician. Dietetic technicians must have good communication skills

Table 1–19 Dietary Service Occupations

Career	Education	Testing and Licensure
Dietitian (RD)	Bachelor's degree (minimum)	Licensure, certification, or registration required in most states. Registration available from Academy of Nutrition and Dietetics: 1. Complete educational program approved by the Academy 2. Complete supervised experience 3. Pass national exam administered by Commission on Dietetic Registration
Dietetic Technician (DTR)/Dietetic Assistant	Associate's degree	Complete educational program approved by the Academy Voluntary registration available from Commission on Dietetic Registration
Dietetic Aide	Certificate program in food services or on-the-job training	None

and be attentive to detail and able to follow specific directions. The projected employment rate is expected to be good. *See https://www.bls.gov/oes/2017/may/oes292051.htm.*

Biomedical Engineering

The application of engineering to health care has resulted in the creation of sophisticated medical equipment that helps in diagnosing, treating, and monitoring patient conditions. Life-enhancing and lifesaving inventions resulting from biomedical engineering include the heart-lung machine, cardiac pacemakers, surgical lasers, and ultrasound technology. All engineering specialties, including electrical, mechanical, computer, and chemical, have been applied to seeking improvements in health care. (See Table 1–20.)

Biomedical Equipment Technologist/Technician or Medical Equipment Repairer

Biomedical equipment technicians are specially trained to work on medical equipment that requires continual and competent maintenance to provide accurate diagnoses and reliable service to treat and monitor patients. Duties of the technician include installing, testing, servicing, and repairing all types of equipment. Technicians may specialize in one area, such as radiology or clinical laboratory equipment. Work in this area requires excellent manual dexterity, hand–eye coordination, mechanical aptitude, and interest in technology. Projected employment is expected to be much faster than average. *See https://www.bls.gov/ooh/installation-maintenance-and-repair/medical-equipment-repairers.htm.*

Table 1–20 Biomedical Engineering Occupations

Career	Education	Testing and Licensure
Biomedical Engineer	Bachelor's degree or higher	Licensed for some employment positions in some states Many states require passing exams administered by National Council of Examiners for Engineering and Surveying Certification also available from International Certification Commission for Clinical Engineering and Biomedical Technology (ICC): 1. Complete degree in engineering 2. Have at least 3 years of experience as hospital clinical engineer 3. Pass both written and oral exams
Biomedical Equipment Technician	Associate's degree	Certifications available from ICC: 1. Associate's degree in biomedical engineering or specific combinations of training and experience 2. Pass written exam

Sources of Additional Information

Students should use the tables and information in this text as a starting point and then thoroughly investigate all the career options in their areas of interest. Good starting points for collecting career information include the following:

1. The websites listed at the end of each paragraph describing a job title are from the U.S. Bureau of Labor's Occupational Outlook Handbook. They contain a summary of Quick Facts about the occupation, a short video that describes the work, median pay, educational requirements, personal attributes necessary for success in the occupation, and links to web pages that contain more detailed information.
2. The professional organizations for the various occupations. The contact information for these organizations is listed in Appendix 1.
3. Talking with and/or observing (shadowing) health care professionals about their work: your physician and dentist and his/her staffs; any other health care professionals you know.
4. Your instructors who work or have worked in the field may provide information.
5. Occupational Outlook Handbook from the Bureau of Labor Statistics: www.bls.gov/ooh/healthcare/.
6. Career One Stop, sponsored by the U.S. Department of Labor: https//careeronestop.org.
7. O*Net, sponsored by the U.S. Department of Labor: www.onetonline.org.
8. Explore Health Careers: https://explorehealthcareers.org.

SUGGESTED LEARNING ACTIVITIES

1. Create a personal plan for developing the core qualities demonstrated by health care professionals.
2. Determine if there are study skills you need to improve and create a plan to improve them.
3. Choose a problem in your life that you would like to work on and apply the five steps of the problem-solving process. Report on the results.
4. Seek opportunities to observe health care professionals at work. Report on the qualities they demonstrate that you believe make them effective.
5. Research an occupational area or specific career that interests you: interview a working professional, send for information or visit the Internet site of the appropriate professional organization (see Appendix 1), request a job description from a local facility, and/or read the job descriptions in the *Occupational Outlook Handbook*.

WEB ACTIVITIES

WikiHow

https://www.wikihow.com/Improve-Your-Study-Skills

How to Improve Your Study Skills

1. Read this illustrated guide.
2. Are there any suggestions you think might help you?
3. If so, try them for a couple of weeks and report on how they work for you.

Study Guides and Strategies

www.studygs.net

This is an excellent website with information on dozens of topics, including study habits, time management, writing effectively, and much more.

1. Choose any topics you think might help you improve your chance for success in school.
2. Select one or two to apply and report on the results.

Operation Self Reset

https://www.langspace.com/en/video/10560442669729526

Four "Study Tips" That Work

Careers in Government

https://www.careersingovernment.com/tools/gov-talk/career-advice/on-the-job/7-advantages-working-healthcare-industry/

Seven Advantages of Working in the Healthcare Industry

1. List the advantages described in the article.
2. Which one is most important to you? Why?
3. Are there advantages not listed that you believe are important?

Rasmussen College

https://www.rasmussen.edu/degrees/health-sciences/blog/working-in-the-healthcare-industry/

Seven Compelling Reasons to Consider Working in the Healthcare Industry

1. Compare the reasons listed here with those in the previous activity, Careers in Government. Which new ones are listed here?
2. Did this list add any information to help you make a career decision?

Open Colleges

https://www.opencolleges.edu.au/blog/2017/11/06/ca-6-qualities-truly-great-health-professionals/

Six Qualities of Truly Great Health and Community Care Professionals

Here is a list that is different from the core qualities listed in this text.

1. Do you agree that these qualities are important?
2. If so, do you believe that you have these qualities?
3. If you don't, and you think they are important, how might you develop them?

Live Strong

https://www.livestrong.com/article/239565-what-are-the-benefits-of-volunteering-in-a-hospital/

What Are the Benefits of Volunteering in a Hospital?

1. What types of volunteer positions may be available in a hospital?
2. What are the benefits for volunteers?
3. What are the benefits for patients?

Nursing Times

https://www.nursingtimes.net/thinking-your-way-to-successful-problem-solving/200636.article

Thinking Your Way to Successful Problem-Solving

Although written for nurses a number of years ago, this article shows how problem-solving is applied on the job in health care.

1. What are the two kinds of approaches nurses can use when approaching problems?
2. What are the three kinds of problems nurses are likely to encounter?
3. Why is perception important when addressing problems that deal with other people?
4. When should other people be involved in generating solutions to a problem?
5. What are some methods for generating ideas for solutions?
6. How does this information apply to the careers that interest you?