
# Medical Terminology

## An Illustrated Guide

8th edition

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8th edition

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For all his continued personal and professional support over so many years, I dedicate this 8th edition of *Medical Terminology: An Illustrated Guide*, to my husband, Matthew Jarvis Cohen.

**—Barbara Cohen**

To my husband Michael and my children, Drs. Bob and Marie Howard, Paul and Maria DePetris, for their unrelenting support and patience; to Shirley Wells and Dr. Janice Griffin for their continued encouragement and love; and to Barbara Cohen without whose commitment and guidance this would not have been possible. It's to all of you I dedicate this edition.

**—Ann DePetris**

# Preface

Knowledge of medical terminology is fundamental to a wide variety of healthcare fields. This book is designed to satisfy the basic learning requirements needed to practice in any health career setting. In the course of your training and future careers, you will need to learn thousands of new terms. The job might be overwhelming if not for learning the skills of dividing the words into their component parts. These roots, suffixes, and prefixes appear over and over in different terms but retain the same meanings. Knowing these meanings will help you define and remember a host of words. This process is like using a set of building blocks to assemble different structures. Using a more scientific example, it's like using the four bases in DNA to code for all the amino acids needed to make proteins.

After the introductory sections, each chapter begins with an illustrated overview of a specific body system with definitions of the key terms related to that system. Tables of word parts and exercises on using them follow. Turning to the abnormal, a section on diseases and treatments is included, followed by definitions of relevant key terms. The section of supplementary terms includes words and phrases that are "good to know" if time allows or if someone is particularly interested in that specialty. The sequence of the systems chapters differs slightly from that found in traditional anatomy and physiology books. The organization emphasizes their clinical importance, starting with the cardiovascular, respiratory, and digestive systems and continuing with systems treated in more specialized fields, such as the urinary, reproductive, and musculoskeletal systems. The chapters can be taken out of order once the introductory units are completed.

We have tried to make this book easy to use and full of reinforcing drills. We have also included many phonetic pronunciations so you can recognize technical terms when they are spoken and can comfortably use them yourself. The online student learning resources offer many additional activities and an audio glossary. Each chapter is enlivened with a short opening case study. These may have some words and abbreviations that are unfamiliar to you, especially at the start of the book. They are included to spark your interest in the chapter material, and give you a sense of medical situations and language. Don't be concerned if you don't understand them completely. Return to them after you study the chapter, or even later chapters, and see if they are more understandable.

You are probably at the beginning of a long journey to gain accomplishment in your chosen field. We hope that this book will aid you in that endeavor and provide a basis on which to build your career.

*—Barbara Cohen*
*—Ann DePetris*

# Acknowledgments

In our constant quest to improve the quality of *Medical Terminology: An Illustrated Guide*, we rely on the advice and talents of many people. First, we want to acknowledge the observant instructors and students who take the time to suggest improvements in the text. Also we thank the reviewers, who make many valuable suggestions for revisions. The clinicians who contributed current information in their respective fields include Margaret O. Burr, BS, RVT, RDMS; Michael DePetris, RPh; Paul DePetris, BS; Mary Green, PA-C; Nancy Gurzick, RDH, BS, MA; Marie Howard, PT, DPT; Robert Howard, DO; Bonnie L. Lehman, BSN, MS, CNM; Christine Licari, RD; Pamela Morgan, OTR/L; Christina Olkowski, MT (ASCP); Donna Robertson, RNC, MSA; Anne Tobin, RN, MSN, ACNP; and Terese A. Trost, MA, RT. The information they shared will help guide students through various career paths. Thanks to you all.

As always, we are grateful to the dedicated staff of Lippincott Williams & Wilkins; especially for this edition, Staci Wolfson, Product Development Editor, who worked on every aspect of the book and its ancillaries; Jonathan Joyce, Senior Acquisitions Editor, who oversaw this project from start to finish; and Art Director, Jennifer Clements, who consistently offers exceptional help with illustrations.

*—Barbara Cohen*
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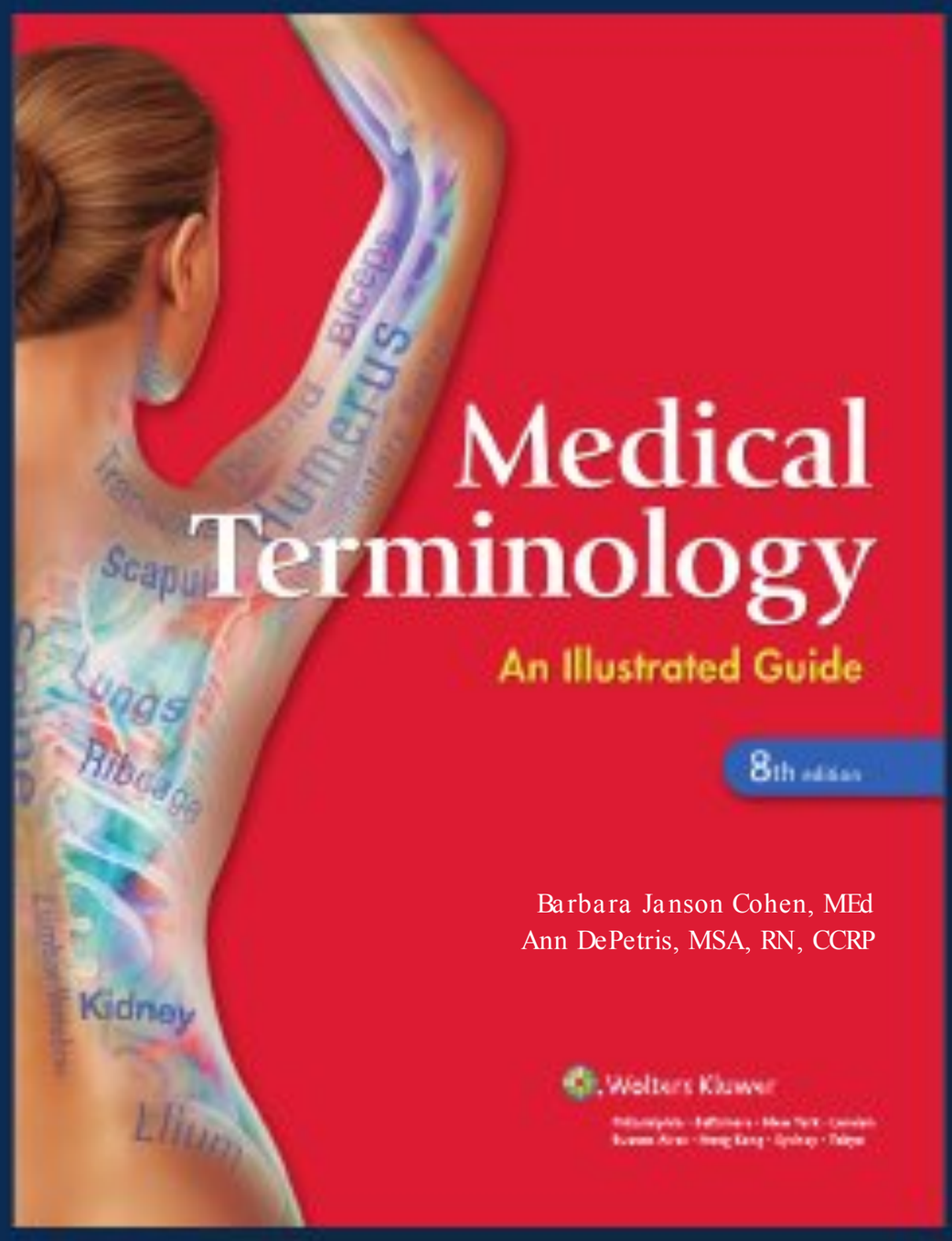
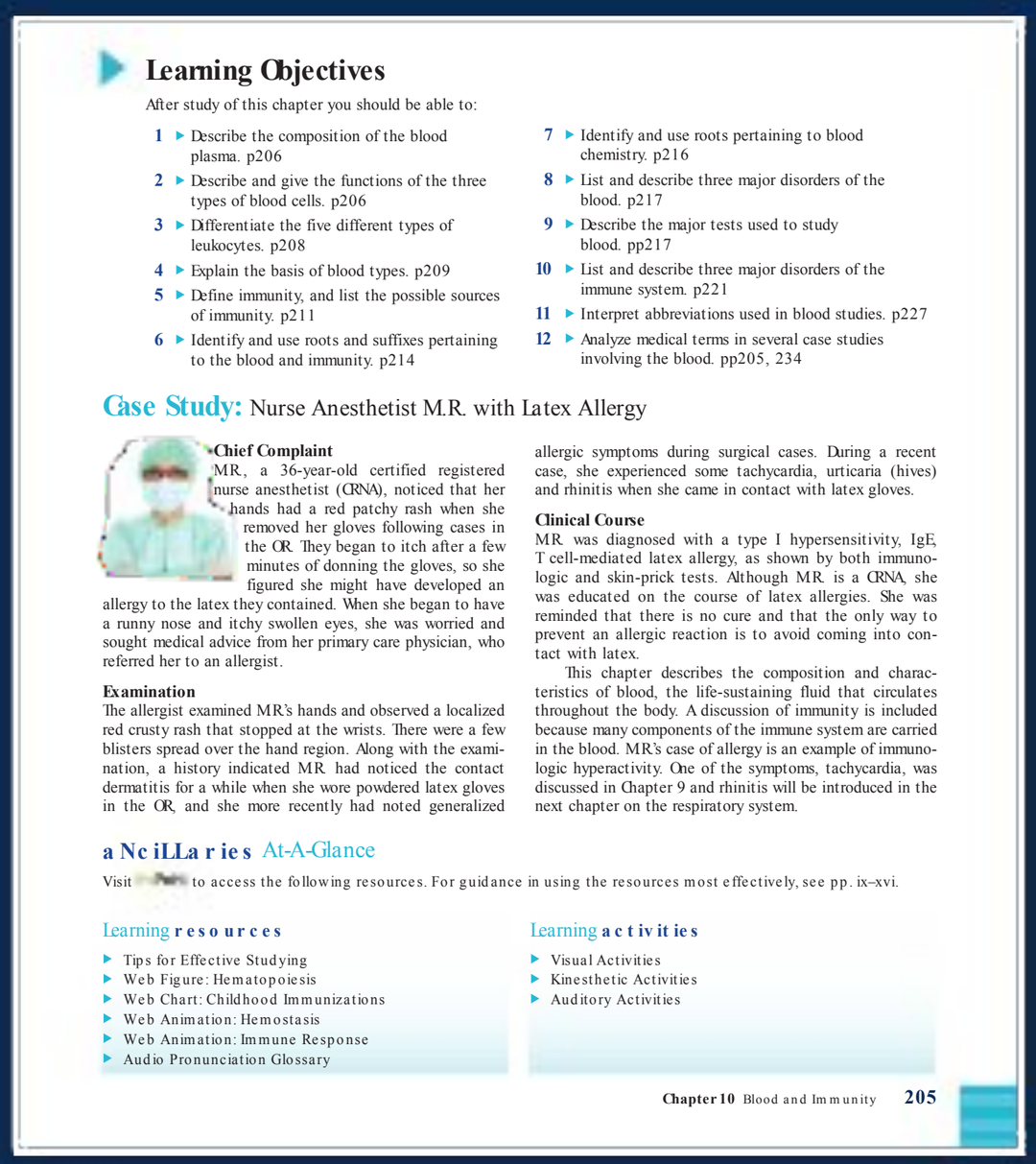
# User's GUide

Medical Terminology: An Illustrated Guide, **8th edition, was created and developed to help you master the language of medicine. The tools and features in the text will help you work through the material presented. Please take a few moments to look through this User's Guide, which will introduce you to the features that will enhance your learning experience.**



**Learning Objectives**

After study of this chapter you should be able to:

1. Describe the composition of the blood plasma. p206
2. Describe and give the functions of the three types of blood cells. p206
3. Differentiate the five different types of leukocytes. p208
4. Explain the basis of blood types. p209
5. Define immunity, and list the possible sources of immunity. p211
6. Identify and use roots and suffixes pertaining to the blood and immunity. p214
7. Identify and use roots pertaining to blood chemistry. p216
8. List and describe three major disorders of the blood. p217
9. Describe the major tests used to study blood. pp217
10. List and describe three major disorders of the immune system. p221
11. Interpret abbreviations used in blood studies. p227
12. Analyze medical terms in several case studies involving the blood. pp205, 234

**Case Study:** Nurse Anesthetist M.R. with Latex Allergy

**Chief Complaint**
M.R., a 36-year-old certified registered nurse anesthetist (CRNA), noticed that her hands had a red patchy rash when she removed her gloves following cases in the OR. They began to itch after a few minutes of donning the gloves, so she figured she might have developed an allergy to the latex they contained. When she began to have a runny nose and itchy swollen eyes, she was worried and sought medical advice from her primary care physician, who referred her to an allergist.

**Examination**
The allergist examined M.R.'s hands and observed a localized red crusty rash that stopped at the wrists. There were a few blisters spread over the hand region. Along with the examination, a history indicated M.R. had noticed the contact dermatitis for a while when she wore powdered latex gloves in the OR, and she more recently had noted generalized allergic symptoms during surgical cases. During a recent case, she experienced some tachycardia, urticaria (hives) and rhinitis when she came in contact with latex gloves.

**Clinical Course**
M.R. was diagnosed with a type I hypersensitivity, IgE, T cell-mediated latex allergy, as shown by both immunologic and skin-prick tests. Although M.R. is a CRNA, she was educated on the course of latex allergies. She was reminded that there is no cure and that the only way to prevent an allergic reaction is to avoid coming into contact with latex.

This chapter describes the composition and characteristics of blood, the life-sustaining fluid that circulates throughout the body. A discussion of immunity is included because many components of the immune system are carried in the blood. M.R.'s case of allergy is an example of immunologic hyperactivity. One of the symptoms, tachycardia, was discussed in Chapter 9 and rhinitis will be introduced in the next chapter on the respiratory system.

**aNciLLaries** At-A-Glance

Visit [redacted] to access the following resources. For guidance in using the resources most effectively, see pp. ix–xvi.

Learning **resources**
- Tips for Effective Studying
- Web Figure: Hematopoiesis
- Web Chart: Childhood Immunizations
- Web Animation: Hemostasis
- Web Animation: Immune Response
- Audio Pronunciation Glossary

Learning **activities**
- Visual Activities
- Kinesthetic Activities
- Auditory Activities



# Chapter Contents, Objectives, and Pretests

**Chapter Opening Case studies and Objectives help you identify learning goals and familiarize yourself with the materials covered in the chapter. Chapter Pretests quiz students on previous knowledge at the beginning of each chapter. students should take each Chapter Pretest before starting the chapter and again after completing the chapter in order to measure progress.**

## detailed illustrations

**illustrations: detailed, full-color drawings and photographs illuminate the chapters. These include clinical photographs and tissue micrographs. The many figures amplify and clarify the text and are particularly helpful for visual learners.**

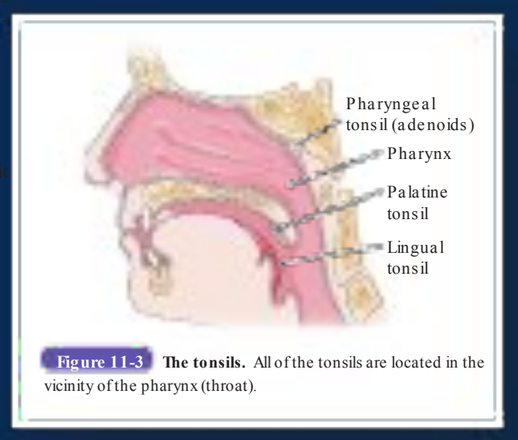



**Figure 11-3** **The tonsils.** All of the tonsils are located in the vicinity of the pharynx (throat).

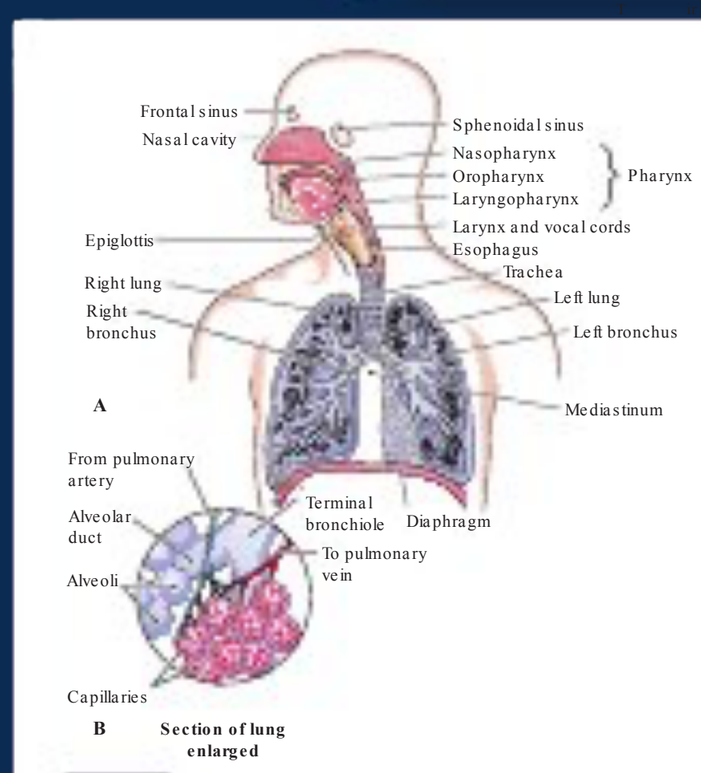



**Figure 11-2** **The respiratory system. A.** Overview. **B.** Enlarged section of lung tissue showing the relationship between the alveoli (air sacs) and the blood capillaries.

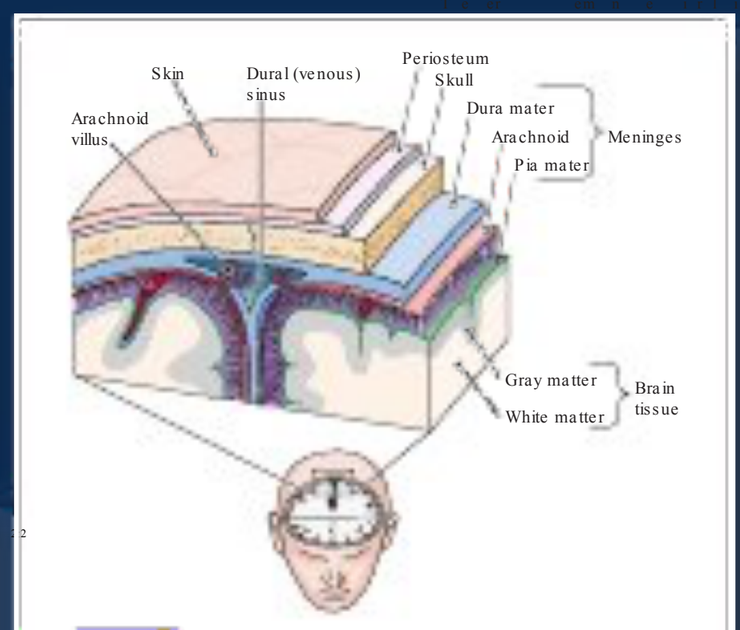



**Figure 17-5** **The meninges.** The three protective layers and adjacent tissue are shown in a frontal section of the head.

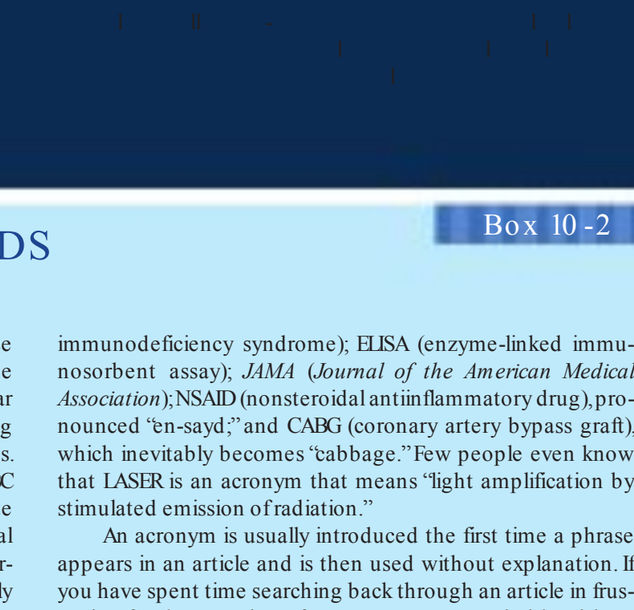
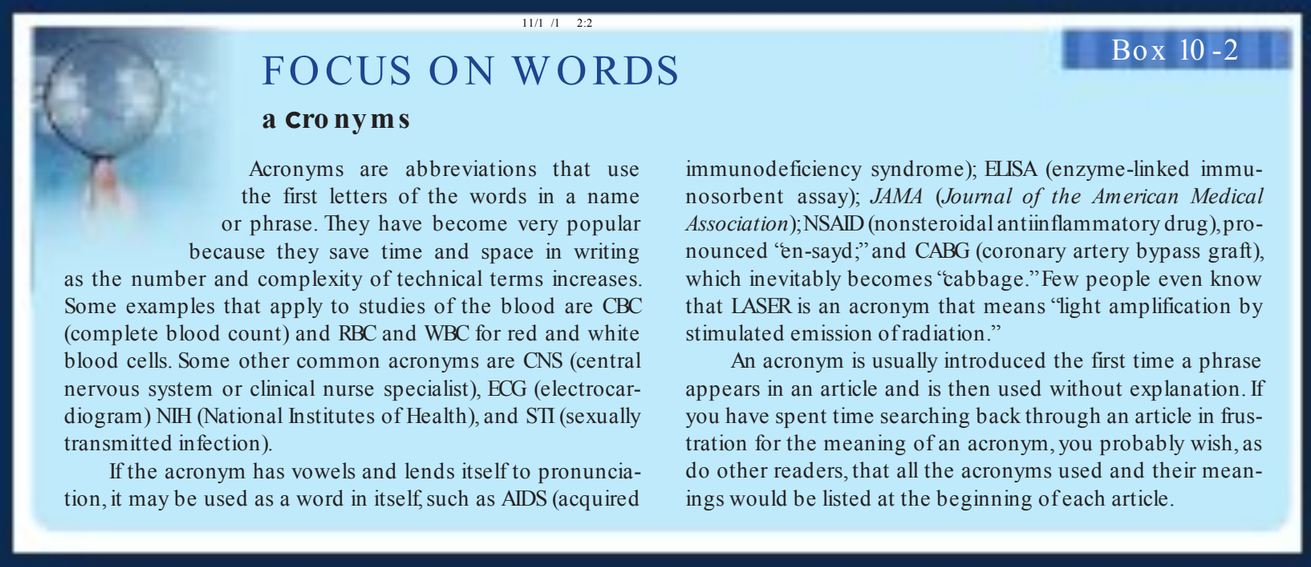



**Figure 17-6** **Cranial nerves.** The 12 nerves are shown on one side in an inferior view.

## Feature Boxes

### Feature Boxes Call Out Important Information

**Focus on Words boxes provide historical or other interesting information on select terms within a chapter.**



Box 10-2

FOCUS ON WORDS

**acronyms**

Acronyms are abbreviations that use the first letters of the words in a name or phrase. They have become very popular because they save time and space in writing as the number and complexity of technical terms increases. Some examples that apply to studies of the blood are CBC (complete blood count) and RBC and WBC for red and white blood cells. Some other common acronyms are CNS (central nervous system or clinical nurse specialist), ECG (electrocardiogram) NIH (National Institutes of Health), and STI (sexually transmitted infection).

If the acronym has vowels and lends itself to pronunciation, it may be used as a word in itself, such as AIDS (acquired immunodeficiency syndrome); ELISA (enzyme-linked immunosorbent assay); *JAMA* (*Journal of the American Medical Association*); NSAID (nonsteroidal antiinflammatory drug), pronounced "en-sayd;" and CABG (coronary artery bypass graft), which inevitably becomes "cabbage." Few people even know that LASER is an acronym that means "light amplification by stimulated emission of radiation."

An acronym is usually introduced the first time a phrase appears in an article and is then used without explanation. If you have spent time searching back through an article in frustration for the meaning of an acronym, you probably wish, as do other readers, that all the acronyms used and their meanings would be listed at the beginning of each article.

Box 18-3

## clinical PersPectives

### eye surgery: A Glimpse of the cutting edge

Cataracts, glaucoma, and refractive errors are common eye disorders. In the past, cataract and glaucoma treatments concentrated on managing the diseases. Refractive errors were corrected using eyeglasses and, more recently, contact lenses. Today, using laser and microsurgical techniques, ophthalmologists can remove cataracts, reduce glaucoma, and allow people with refractive errors to put their eyeglasses and contacts away. These cutting-edge procedures include:

- LASIK (laser in situ keratomileusis) to correct refractive errors. During this procedure, a surgeon uses a laser to reshape the cornea so that it refracts light directly onto the retina, rather than in front of or behind it. A microkeratome (surgical knife) is used to cut a flap in the cornea's outer layer. A computer-controlled laser sculpts the middle layer of the cornea and then the flap is replaced. The procedure takes only a few minutes, and patients recover their vision quickly and usually with little postoperative pain.
- Phacoemulsification to remove cataracts. During this procedure, a surgeon makes a very small incision (~3 mm long) through the sclera near the cornea's outer edge. An ultrasonic probe is inserted through this opening and into the center of the lens. The probe uses sound waves to emulsify the lens's central core, which is then suctioned out. An artificial lens is then permanently implanted in the lens capsule (see **Fig. 18-15**). The procedure is typically painless, although the patient may feel some discomfort for one to two days afterward.
- Laser trabeculoplasty to treat glaucoma. This procedure uses a laser to help drain fluid from the eye and lower intraocular pressure. The laser is aimed at drainage canals located between the cornea and iris and makes several burns that are believed to open the canals and allow better fluid drainage. The procedure is typically painless and takes only a few minutes.

**Clinical Perspectives boxes focus on body processing as well as techniques used in clinical settings.**

**Health Professions boxes focus on a variety of health careers, showing how the knowledge of medical terminology is applied in real-world careers.**

Box 5-1

## HealtH Professions

### Radiologic technologist

Radiologic technologists help in the diagnosis of medical disorders by taking x-ray images (radiographs) of the body. They also use CT scans and other imaging technology to perform examinations on patients to aid physicians diagnosis. Following institutional safety patient mobilization procedures; they must prepare patients for radiologic examinations, place patients in appropriate positions; and then adjust equipment to the correct angles, heights, and settings for taking the x-ray or other diagnostic image. They must position the image receptors correctly and, after exposure, remove and process the images. They are also required to keep patient records and maintain equipment. Radiologic technologists must minimize radiation hazards by using protective equipment for themselves and patients and by delivering the minimum possible amount of radiation. They wear badges to monitor radiation levels and keep records of their exposure.

Radiologic technologists may specialize in a specific imaging technique such as bone densitometry, cardiovascular-interventional radiography, computed tomography, mammography, magnetic resonance imaging, nuclear medicine, and quality management. Some of these will be described in later chapters.

The majority of radiologic technologists work in hospitals, but they may also be employed in physicians' offices, diagnostic imaging centers (e.g., doing mammograms), and outpatient care centers. Radiologic technologists must possess a minimum of an associate's degree to qualify for professional certification. A higher degree is necessary for a supervisory or teaching position. The Joint Review Committee on Education in Radiologic Technology accredits most of the education programs. The American Registry of Radiologic Technologists (ARRT) offers a national certification examination in radiography as well as in other imaging technologies (CT, MRI, nuclear medicine, etc.). ARRT certification is required for employment as a radiologic technologist in most U.S. states. Job opportunities in this field are currently good. The American Society of Radiologic Technologists has information on this career at www.asrt.org.

Box 10-1

## FOR YOUR REFERENCE

### Blood cells

| Cell Type | Number Per Microliter of Blood | Description | Function |
|---|---|---|---|
| Erythrocyte (red blood cell) | 5 million | Tiny (7 mcm diameter), biconcave disk without nucleus (anuclear) | Carries oxygen bound to hemoglobin; also carries some carbon dioxide and buffers blood |
| Leukocyte (white blood cell) | 5,000 to 10,000 | Larger than red cell with prominent nucleus that may be segmented (granulocyte) or unsegmented (agranulocyte); types vary in staining properties | Immunity; protects against pathogens and destroys foreign matter and debris; located in blood, tissues, and lymphatic system |
| Platelet (thrombocyte) | 150,000 to 450,000 | Fragment of large cell (megakaryocyte) | Hemostasis; forms a platelet plug and starts blood clotting (coagulation) |

**For Your r eference boxes provide supplemental information for terms within a chapter.**

# Word Part Tables

## Detailed Tables

**Present roots, prefixes, and suffixes covered in each chapter in an easy-to-reference format (with examples of their use in medical terminology). Word Part Knowledge aids in the learning and understanding of common terminology.**

**table 21-1 Roots Pertaining to the Skin and Associated Structures**

| Root | Meaning | example | Definition of example |
|---|---|---|---|
| derm/o, dermat/o | skin | dermabrasion *derm-ah-BRA-zhun* | surgical procedure used to resurface the skin and remove imperfections |
| kerat/o | keratin, horny layer of the skin | keratinous *keh-RAT-ih-nus* | containing keratin; horny |
| melan/o | dark, black, melanin | melanosome *MEL-ah-no-some* | a small cellular body that produces melanin |
| hidr/o | sweat, perspiration | anhidrosis *an-hi-DRO-sis* | absence of sweating |
| seb/o | sebum, sebaceous gland | seborrhea *seb-or-E-ah* | excess flow of sebum (adjective: seborrheic) |
| trich/o | hair | trichomycosis *trik-o-mi-KO-sis* | fungal infection of the hair |
| onych/o | nail | onychia *o-NIK-e-ah* | inflammation of the nail and nail bed (not an *-itis* ending) |

# exercises

**exercises are designed to test your knowledge before you move to the next learning topic that follows each table.**

EXERCISE 21-1

**identify and define the roots in the following words.**

| | Root | Meaning of Root |
|---|---|---|
| 1. hypodermis (*hi-po-DER-mis*) | | |
| 2. seborrheic (*seb-o-RE-ik*) | | |
| 3. hypermelanosis (*hi-per-mel-ah-NO-sis*) | | |
| 4. dyskeratosis (*dis-ker-ah-TO-sis*) | | |
| 5. hypohidrosis (*hi-po-hi-DRO-sis*) | | |
| 6. hypertrichosis (*hi-per-trih-KO-sis*) | | |
| 7. eponychium (*ep-o-NIK-e-um*) | | |

**Fill in the blanks.**

8. Dermatopathology (*der-mah-to-pah-THOL-o-je*) is study of diseases of the _____.
9. Keratolysis (*ker-ah-TOL-ih-sis*) is loosening of the skin's _____.
10. A melanocyte (*MEL-ah-no-site*) is a cell that produces _____.
11. Trichoid (*TRIK-oyd*) means resembling a(n) _____.
12. Onychomycosis (*on-ih-ko-mi-KO-sis*) is a fungal infection of a(n) _____.
13. Hidradenitis (*hi-drad-eh-NI-tis*) is inflammation of a gland that produces _____.
14. A hypodermic (*hi-po-DER-mik*) injection is given under the _____.

# Term Tables

**Key Terms include the most commonly used terms.**

**terminology Key Terms**

| | |
|---|---|
| glomerular capsule *glo-MER-u-lar KAP-sule* | The cup-shaped structure at the beginning of the nephron that surrounds the glomerulus and receives material filtered out of the blood; Bowman (*BO-man*) capsule |
| glomerular filtrate *glo-MER-u-lar FIL-trate* | The fluid and dissolved materials that filter out of the blood and enter the nephron through the glomerular capsule |
| glomerulus *glo-MER-u-lus* | The cluster of capillaries within the glomerular capsule (plural: glomeruli) (root: glomerul/o) |
| kidney *KID-ne* | An organ of excretion (roots: ren/o, nephr/o); the two kidneys filter the blood and form urine, which contains metabolic waste products and other substances as needed to regulate the water, electrolyte, and pH balance of body fluids |
| micturition *mik-tu-RISH-un* | The voiding of urine; urination |
| nephron *NEF-ron* | A microscopic functional unit of the kidney; working with blood vessels, the nephron filters the blood and balances the composition of urine |
| renal cortex *RE-nal KOR-tex* | The kidney's outer portion; contains portions of the nephrons |
| renal medulla *meh-DUL-lah* | The kidney's inner portion; contains portions of the nephrons and ducts that transport urine toward the renal pelvis |
| renal pelvis *PEL-vis* | The expanded upper end of the ureter that receives urine from the kidney (Greek root *pyel/o* means "basin") |
| renal pyramid *PERE-ah-mid* | A triangular structure in the renal medulla; composed of the nephrons' loops and collecting ducts |
| renin *RE-nin* | An enzyme produced by the kidneys that activates angiotensin in the blood |
| trigone *TRI-gone* | A triangle at the base of the bladder formed by the openings of the two ureters and the urethra (see Fig. 13-4) |
| tubular reabsorption *TUBE-u-lar re-ab-SORP-shun* | The return of substances from the glomerular filtrate to the blood through the peritubular capillaries |
| urea *u-RE-ah* | The main nitrogenous (nitrogen-containing) waste product in the urine |
| ureter *U-re-ter* | The tube that carries urine from the kidney to the bladder (root: ureter/o) |
| urethra *u-RE-thrah* | The tube that carries urine from the bladder to the outside of the body (root: urethr/o) |

## terminology Supplementary Terms (Continued)

| | |
|---|---|
| Simmonds disease | Hypofunction of the anterior pituitary (panhypopituitarism), usually because of an infarction; pituitary cachexia (*ka-KEK-se-a*) |
| thyroid storm | A sudden onset of thyrotoxicosis symptoms occurring in patients with hyperthyroidism who are untreated or poorly treated; may be brought on by illness or trauma; also called thyroid crisis |
| thyrotoxicosis *thi-ro-tok-sih-KO-sis* | Condition resulting from overactivity of the thyroid gland; symptoms include anxiety, irritability, weight loss, and sweating; the main example of thyrotoxicosis is Graves disease |
| von Recklinghausen disease *REK-ling-how-zen* | Bone degeneration caused by excess production of parathyroid hormone; also called Recklinghausen disease of bone |
| **Diagnosis and treatment** | |
| fasting plasma glucose (FPG) | Measurement of blood glucose after a fast of at least eight hours; a reading equal to or greater than 126 mg/dL indicates diabetes; also called fasting blood glucose (FBG) or fasting blood sugar (FBS) |
| free thyroxine index (FTI, $T_7$) | Calculation based on the amount of $T_4$ present and $T_3$ uptake, used to diagnose thyroid dysfunction |
| oral glucose tolerance test (OGTT) | Measurement of glucose levels in blood plasma after administration of a challenge dose of glucose to a fasting patient; used to measure patient's ability to metabolize glucose; a value equal to or greater than 200 mg/dL in the two-hour sample indicates diabetes |
| radioactive iodine uptake test (RAIU) | A test that measures thyroid uptake of radioactive iodine as an evaluation of thyroid function |
| radioimmunoassay (RIA) | A method of measuring very small amounts of a substance, especially hormones, in blood plasma using radioactively labeled hormones and specific antibodies |
| thyroid scan | Visualization of the thyroid gland after administration of radioactive iodine |
| thyroxine-binding globulin (TBG) test | Test that measures the main protein that binds $T_4$ in the blood |
| transsphenoidal adenomectomy *trans-sfe-NOY-dal ad-eh-no-MEK-to-me* | Removal of a pituitary tumor through the sphenoid sinus (space in the sphenoid bone) |

Go to the Audio Pronunciation Glossary in the Student Resources on to hear these terms pronounced.

**Supplementary Terms list more specialized terms.**

## terminology abbreviations

| | | | |
|---|---|---|---|
| ACE | Angiotensin-converting enzyme | CHD | Coronary heart disease |
| AED | Automated external defibrillator | CHF | Congestive heart failure |
| AF | Atrial fibrillation | CK-MB | Creatine kinase MB |
| AMI | Acute myocardial infarction | CPR | Cardiopulmonary resuscitation |
| APC | Atrial premature complex | CRP | C-reactive protein |
| AR | Aortic regurgitation | CTA | Computed tomography angiography |
| ARB | Angiotensin receptor blocker | CVA | Cerebrovascular accident |
| AS | Aortic stenosis; arteriosclerosis | CVD | Cardiovascular disease |
| ASCVD | Arteriosclerotic cardiovascular disease | CVI | Chronic venous insufficiency |
| ASD | Atrial septal defect | CVP | Central venous pressure |
| ASHD | Arteriosclerotic heart disease | DOE | Dyspnea on exertion |
| AT | Atrial tachycardia | DVT | Deep vein thrombosis |
| AV | Atrioventricular | ECG (EKG) | Electrocardiogram, electrocardiography |
| BBB | Bundle branch block (left or right) | HDL | High-density lipoprotein |
| BP | Blood pressure | hs-CRP | High-sensitivity C-reactive protein (test) |
| bpm | Beats per minute | HTN | Hypertension |
| CABG | Coronary artery bypass graft | IABP | Intraaortic balloon pump |
| CAD | Coronary artery disease | ICD | Implantable cardioverter defibrillator |
| CCU | Coronary/cardiac care unit | IVCD | Intraventricular conduction delay |

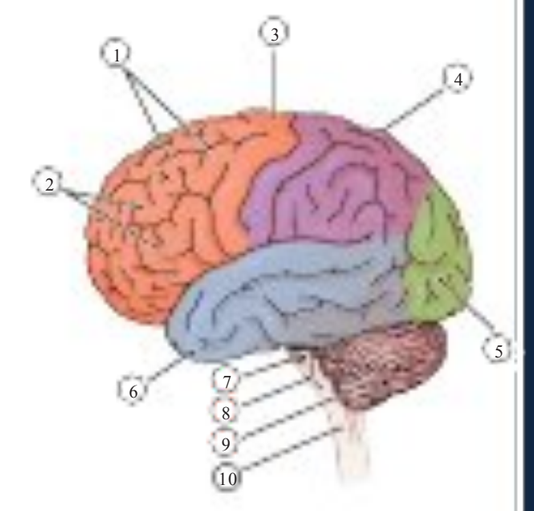
**Abbreviations are listed for common terms.**

### Lateral surface of the brain

Write the name of each numbered part on the corresponding line.

Cerebellum
Frontal lobe
Gyri
Medulla oblongata
Occipital lobe
Parietal lobe
Pons
Spinal cord
Sulci
Temporal lobe

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____




### Spinal cord, lateral view

Write the name of each numbered part on the corresponding line.

Brain
Brainstem
Cervical enlargement
Cervical nerves
Coccygeal nerve
Lumbar enlargement
Lumbar nerves
Sacral nerves
Spinal cord
Thoracic nerves

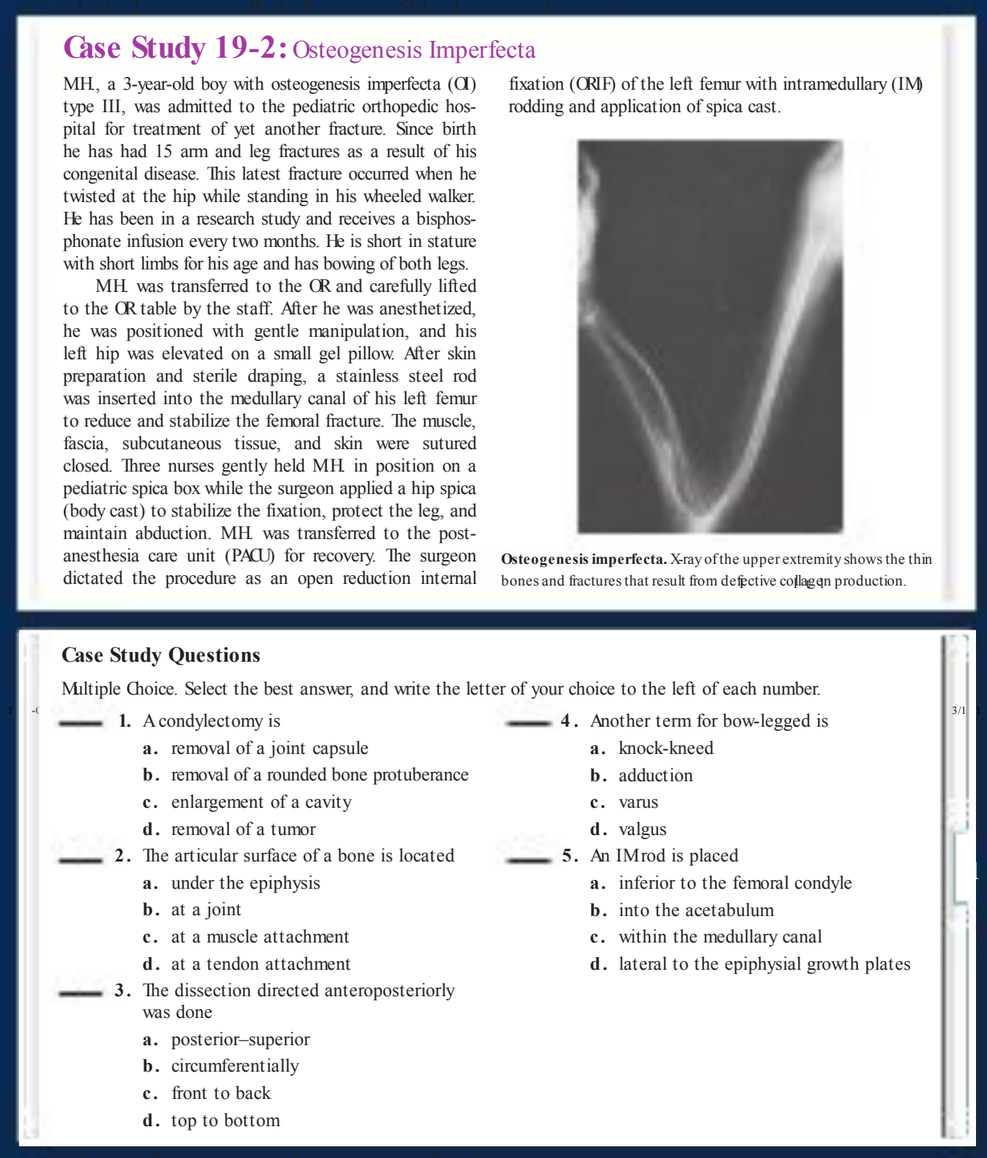
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____


## Chapter review exercises

**Chapter review exercises are designed to test your knowledge of the chapter material and appear at the end of each chapter.**

# Case studies and Case study Questions

**Case studies and Case study Questions at the end of every chapter present terminology in the context of a medical report. These are an excellent review tool as they test your cumulative knowledge of medical terminology and put terminology into a real-world context.**



**Case Study 19-2:** Osteogenesis Imperfecta

MH, a 3-year-old boy with osteogenesis imperfecta (OI) type III, was admitted to the pediatric orthopedic hospital for treatment of yet another fracture. Since birth he has had 15 arm and leg fractures as a result of his congenital disease. This latest fracture occurred when he twisted at the hip while standing in his wheeled walker. He has been in a research study and receives a bisphosphonate infusion every two months. He is short in stature with short limbs for his age and has bowing of both legs.

MH was transferred to the OR and carefully lifted to the OR table by the staff. After he was anesthetized, he was positioned with gentle manipulation, and his left hip was elevated on a small gel pillow. After skin preparation and sterile draping, a stainless steel rod was inserted into the medullary canal of his left femur to reduce and stabilize the femoral fracture. The muscle, fascia, subcutaneous tissue, and skin were sutured closed. Three nurses gently held MH in position on a pediatric spica box while the surgeon applied a hip spica (body cast) to stabilize the fixation, protect the leg, and maintain abduction. MH was transferred to the post-anesthesia care unit (PACU) for recovery. The surgeon dictated the procedure as an open reduction internal fixation (ORIF) of the left femur with intramedullary (IM) rodding and application of spica cast.



**Osteogenesis imperfecta.** X-ray of the upper extremity shows the thin bones and fractures that result from defective collagen production.

**Case Study Questions**

Multiple Choice. Select the best answer, and write the letter of your choice to the left of each number.

____ **1.** A condylectomy is
- **a.** removal of a joint capsule
- **b.** removal of a rounded bone protuberance
- **c.** enlargement of a cavity
- **d.** removal of a tumor

____ **2.** The articular surface of a bone is located
- **a.** under the epiphysis
- **b.** at a joint
- **c.** at a muscle attachment
- **d.** at a tendon attachment

____ **3.** The dissection directed anteroposteriorly was done
- **a.** posterior–superior
- **b.** circumferentially
- **c.** front to back
- **d.** top to bottom

____ **4.** Another term for bow-legged is
- **a.** knock-kneed
- **b.** adduction
- **c.** varus
- **d.** valgus

____ **5.** An IM rod is placed
- **a.** inferior to the femoral condyle
- **b.** into the acetabulum
- **c.** within the medullary canal
- **d.** lateral to the epiphysial growth plates

## student resources and thePoint

**People learn in different ways. some students learn best by reading. Others take in new information best by listening to their instructors. You may prefer to write down notes. When you understand the way that you process information most effectively, you can choose resources that fit your learning style. ThePoint is a practical system that lets you learn faster, remember more, and achieve success.**

### Getting Started with the Student Resources and thePoint

**Your journey begins with your textbook,** Medical Terminology: An Illustrated Guide**, 8th edition. At many points in the textbook you will find highlighted notices that guide you to resources and activities designed for your personal learning style.**

**Go to the pronunciation glossary on the student resources to hear these words pronounced.**

**inside the front cover of your textbook, you will find your personal access code. Use it to log on to thePoint—the companion website for this textbook. On the website, you can access learning activities in a variety of learning styles and choose the ones that will help you understand the material quickly and efficiently.**

**Visit thePoint.lww.com/CohenMedTerm8e on thePoint—the companion website for** Medical Terminology: An Illustrated Guide**, 8th edition, which will allow you to search and sort activities by learning style to choose the most effective way for you to learn the material. r esources and activities available to students include the following:**

- **Multiple choice, true–false, and f ll-in-the-blank questions**
- **Categories**
- **Listen & Label and Look & Label**
- **Word Building**
- **Zooming In**
- **Pronounce It**
- **Spell It**
- **Sound It**
- **Hangman**
- **Crossword Puzzles**
- **Quiz Show**
- **Concentration**
- **Case Studies and Case Study Questions**
- **Dictionary and Audio Glossary application**
- **Flashcards and Flashcard Generator applications**
- **Animations**
- **Audio Drills (which allow for chapter audio f les to be downloaded as MP3 f les)**
- **Chapter Quizzes**

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**PrepU, Lippincott's adaptive learning system, is an integral component of** Medical Terminology: An Illustrated Guide**.**


**PrepU uses repetitive and adaptive quizzing to build mastery of medical terminology concepts, helping students to learn more while giving instructors the data they need to monitor each student's progress, strengths, and weaknesses. The hundreds of questions in PrepU offer students the chance to drill themselves on medical terminology and support their review and retention of the information they've learned. each question not only provides an explanation for the correct answer, but also references the text page for the student to review the source material. PrepU for** Medical Terminology **challenges students with questions and activities that coincide with the materials they've learned in the text and gives students a proven tool to learn medical terminology more effectively. For instructors, PrepU provides tools to identify areas and topics of student misconception; instructors can use these rich course data to assess students' learning and better target their in-class activities and discussions, while collecting data that are useful for accreditation.**


**A learning experience individualized to each student. An adaptive learning engine, PrepU offers questions customized for each student's level of understanding, challenging students at an appropriate pace and diff culty level, while dispelling common misconceptions. As students review and master PrepU's questions, the system automatically increases the diff culty of questions, effectively driving student understanding of medical terminology to a mastery level. PrepU not only helps students to improve their knowledge, but also helps foster their test-taking conf dence.**

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1. **in an introductory nursing course at Central Carolina Technical College, student course outcomes were positively associated with PrepU usage. The students who answered the most PrepU questions in the class also had the best overall course grades.**
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**To see a video explanation of PrepU, go to http://download.lww.com/wolterskluwer_vitalstream_com/mktg/prepuvid/prepupromo01.html.**

# Contents

# Expanded Contents

Part

I

# Introduction to Medical Terminology

CHa Pt Er

1

# Concepts of Medical Terminology


## Pretest

Multiple Choice. Select the best answer, and write the letter of your choice to the left of each number.

____ 1. The main part of a word is called the
   a. origin
   b. prefix
   c. root
   d. extension

____ 2. A word part at the beginning of a word is a
   a. prefix
   b. combining form
   c. preview
   d. root

____ 3. A word part at the end of a word is the
   a. vowel
   b. adjective
   c. insertion
   d. suffix

____ 4. The adjective form of cervix, meaning "neck," is
   a. cervical
   b. cervixal
   c. cervous
   d. cerval

____ 5. The ch in the word chemical is pronounced like the letter
   a. s
   b. h
   c. k
   d. f

____ 6. The ps in the word psychology is pronounced like the letter
   a. p
   b. s
   c. j
   d. k

____ 7. The word below that has a hard g is
   a. grip
   b. page
   c. gem
   d. judge

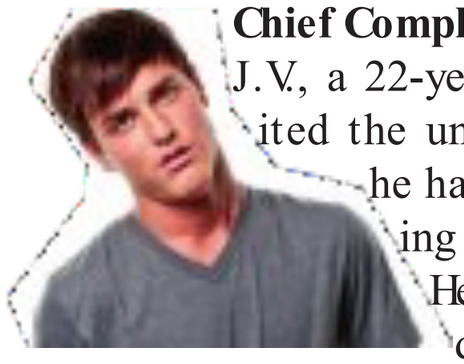
____ 8. The symbol ↓ means
   a. start
   b. turn
   c. decrease
   d. left

# Learning Objectives

After study of this chapter, you should be able to:

1. Explain the purpose of medical terminology. p4
2. Name the languages from which most medical word parts are derived. p4
3. Define the terms root, suffix, and prefix. p4
4. Explain what combining forms are and why they are used. p5
5. Pronounce words according to the pronunciation guide used in this text. p6
6. List three features of medical dictionaries. p8
7. Identify medical words and abbreviations in case studies to review concepts of medical terminology. pp3, 13

## Case Study: J.V.'s Digestive Problems



**Chief Complaint**

J.V., a 22-year-old (y/o) college student, visited the university health clinic and stated he had a four-month history of a burning pain in the middle of his chest. He notices it more at night and has difficulty sleeping because of the pain. He also states that the pain seems to occur more frequently following late-night college gatherings where pizza, spicy chicken wings, and beer are served.

**Examination**

A well-nourished 22-year-old male complaining of (c/o) epigastric (upper abdominal) pain no longer relieved by antacids; orthopnea—currently sleeping with three pillows to aid in breathing; occasional swallowing problems, or dysphagia; ETOH (alcohol) consumption is six to eight beers per week; nonsmoker; no neurologic, musculoskeletal, genitourinary, or respiratory deficits. Referred to a gastroenterologist for ↑ acid production and gastroesophageal reflux disease (GERD).

**Clinical Course**

The gastroenterologist saw J.V. and ordered an x-ray study of his upper gastrointestinal (GI) system. Results demonstrated reflux disease, and J.V. underwent an esophageal gastroduodenoscopy (EGD) to visually examine his digestive organs from his esophagus to his small intestine. Results showed no evidence of bleeding, ulcerations, or strictures. The student was given educational material on GERD, including dietary recommendations. He was started on Prevacid and will be reevaluated in six months.

In this chapter, you learn about how medical words are constructed and also learn about the use of abbreviations and other types of shorthand in medical writing. Later in the chapter, we revisit J.V. and see how he is progressing under treatment.

## Ancillaries At-A-Glance

Visit thePoint to access the following resources. For guidance in using the resources most effectively, see pp. ix–xvi.

### Learning Resources

- Tips for Effective Studying
- Web Chart: "Do Not Use" Abbreviations and Symbols
- Audio Pronunciation Glossary

### Learning Activities

- Visual Activities
- Kinesthetic Activities
- Auditory Activities

# introduction

Medical terminology is a special vocabulary used by healthcare professionals for effective and accurate communication. Every health-related field requires an understanding of medical terminology, and this book highlights selected healthcare occupations in special boxes (**Box 1-1**). Because it is based mainly on Greek and Latin words, medical terminology is consistent and uniform throughout the world. It is also efficient; although some of the terms are long, they often reduce an entire phrase to a single word. The one word *gastroduodenostomy*, for example, means "a communication between the stomach and the first part of the small intestine" (**Fig. 1-1**). The part *gastr* means stomach; *duoden* represents the duodenum, the first part of the small intestine; and *ostomy* means a communication.

The medical vocabulary is vast, and learning it may seem like learning the entire vocabulary of a foreign language. Moreover, like the jargon that arises in all changing fields, it is always expanding. Think of the terms that have been added to our vocabulary in relation to computers, such as *software*, *search engine*, *flash drive*, *app*, and *blog*. The task may seem overwhelming, but there are methods to aid in learning and remembering words and even to help make informed guesses about unfamiliar words. Most medical terms can be divided into component parts—roots, prefixes, and suffixes—that maintain the same meaning whenever they appear. By learning these meanings, you can analyze and remember many words.

# Word Parts

Word components fall into three categories:

1. The **root** is the fundamental unit of each medical word. It establishes the basic meaning of the word and is the part to which modifying word parts are added.
2. A **suffix** is a short word part or series of parts added at the end of a root to modify its meaning. This book indicates suffixes by a dash before the suffix, such as *-itis* (inflammation).

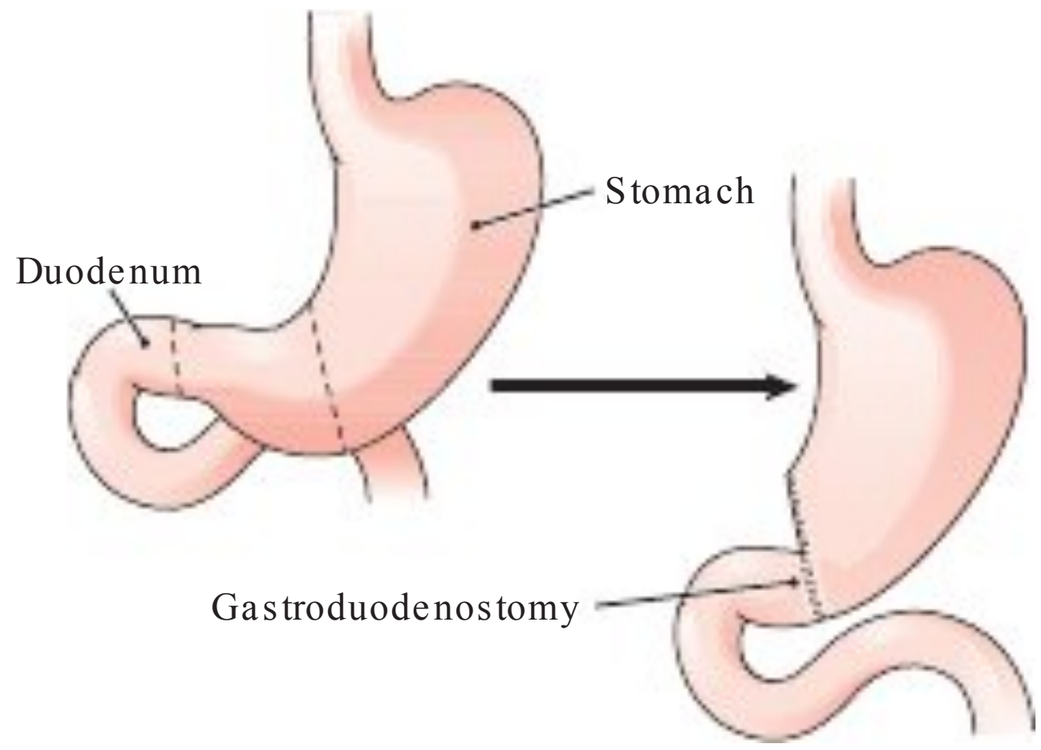



**Figure 1-1** **Gastroduodenostomy.** A communication (-stomy) between the stomach (gastr) and the first part of the small intestine, or duodenum (duoden).



Box 1-1

## HealtH Professions

### Health information technicians

Patient medical records are used as the basis for all medical care delivered. Every time a patient receives medical treatment, information is added to the patient's medical record, which includes the medical history, data about symptoms, test results, diagnoses, treatments, and follow-up care. Health information technicians (HITs) organize and manage these records and work closely with physicians, nurses, and other health professionals to ensure that they provide a complete and accurate basis for quality patient care.

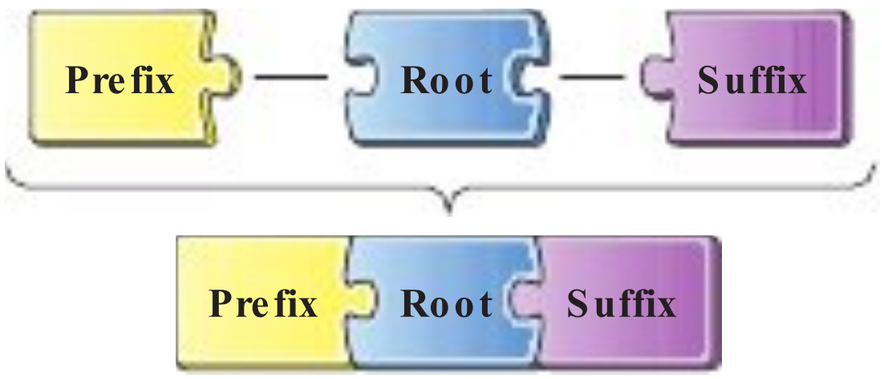
Accurate medical records are essential for administrative purposes, third-party payers, and researchers. Health information technicians assign a code to each diagnosis and procedure a patient receives, and this information is used for accurate patient billing. In addition, health information technicians analyze medical records to reveal trends in health and disease. This research can be used to improve patient care, manage costs, and help establish new medical treatments.

To read and interpret medical records, health information technicians need a thorough background in medical terminology. Students planning to pursue this career may obtain a certificate in health information technology or complete an associate's degree in health information technology at a community college. Those wanting to move into an administrative role may complete advanced studies and a bachelor's degree in health informatics at a university. A certification examination is required to become certified as a registered health information technician (RHIT). Many institutions prefer to hire individuals who are professionally certified.

Most health information technicians work in hospitals and long-term care facilities. Others may work in medical clinics, government agencies, insurance companies, and consulting firms. Because of the growing need for medical care, health information technology is projected to be one of the fastest growing careers in the United States.

For more information about this profession, contact the American Health Information Management Association at www.ahima.org.

3. A **prefix** is a short word part added before a root to modify its meaning. This book indicates prefixes by a dash after the prefix, such as *pre-* (before).




Words are formed from roots, suffixes, and prefixes.

The simple word *learn* can be used as a root to illustrate. If we add the suffix *-er* to form *learner*, we have "one who learns." If we add the prefix *re-* to form *relearn*, we have "to learn again."

Not all roots are complete words. In fact, most medical roots are derived from other languages and are meant to be used in combinations. The Greek word *kardia*, for example, meaning "heart," gives us the root *cardi*. The Latin word *pulmo*, meaning "lung," gives us the root *pulm*. In a few instances, both the Greek and Latin roots are used for the same structure. We find both the Greek root *nephr* and the Latin root *ren* used in words pertaining to the kidney (**Fig. 1-2**).

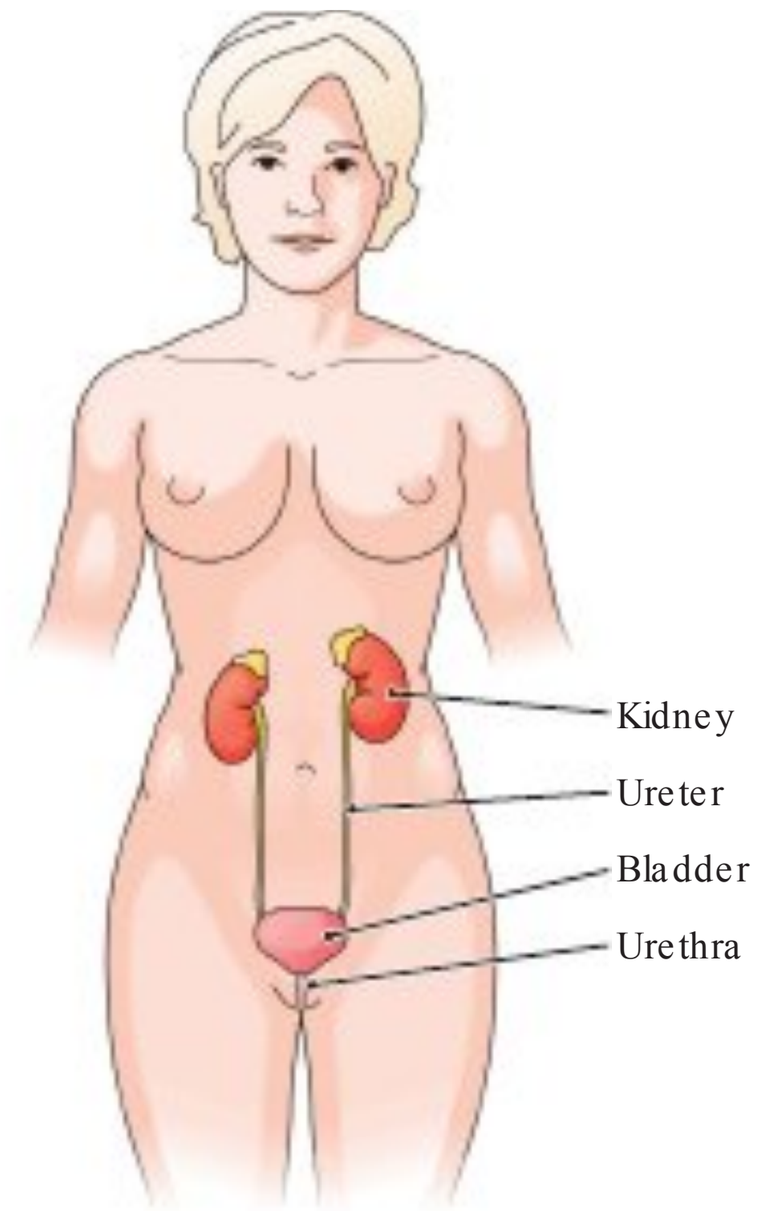


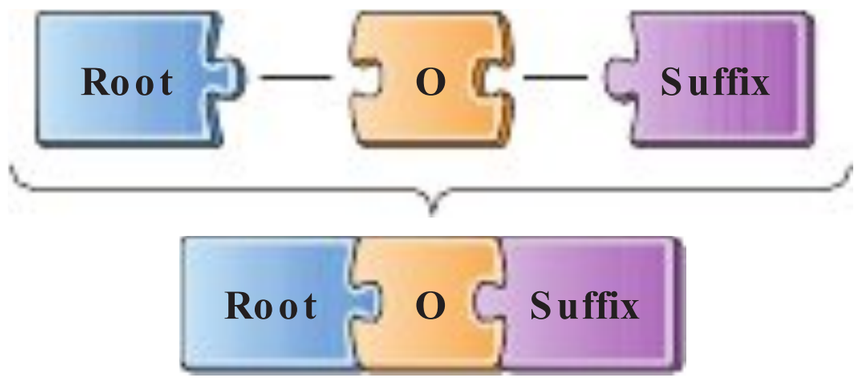

**Figure 1-2 Structures named with more than one word root.** Medical terminology uses both the Greek root *nephr* and the Latin root *ren* for the kidney, an organ of the urinary system.

Note that the same root may have different meanings in different fields of study, just as the words *web, spam, cloud, cookie,* and *tweet* have different meanings in common vocabulary than they do in "computerese." The root *myel* means "marrow" and may apply to either the bone marrow or the spinal cord. The root *scler* means "hard" but may also apply to the white of the eye. *Cyst* means "a filled sac or pouch" but also refers specifically to the urinary bladder. You will sometimes have to consider the context of a word before assigning its meaning. Health information technicians must be skilled in the use of medical language, as described in **Box 1-1**.

A **compound word** contains more than one root. The words *eyeball*, *bedpan*, *frostbite*, and *wheelchair* are examples. Some examples of compound medical words are *cardiovascular* (pertaining to the heart and blood vessels), *urogenital* (pertaining to the urinary and reproductive systems), and *lymphocyte* (a white blood cell found in the lymphatic system).

## COMBINING FORMS

When a suffix or another root beginning with a consonant is added to a root, a vowel is inserted between the root and the next word part to aid in pronunciation. This combining vowel is usually an *o*, as seen in the previous example of gastroduodenostomy, but may occasionally be *a*, *e*, or *i*.

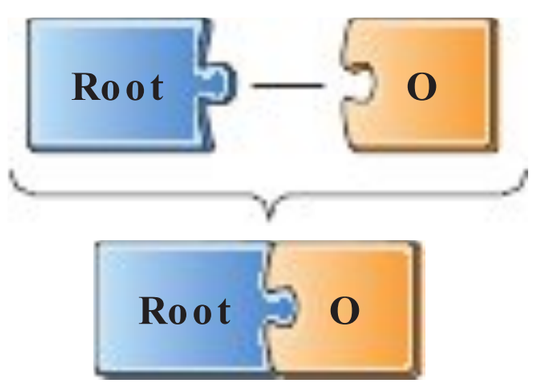



A combining vowel may be added between a root and a word part that follows.

Thus, when the suffix *-logy*, meaning "study of," is added to the root *neur*, meaning "nerve or nervous system," a combining vowel is added:

neur + o + logy = neurology (study of the nervous system)

Roots shown with a combining vowel are called **combining forms**.




A root with a combining vowel is called a combining form.

This text gives roots with their most common combining vowels added after a slash and refers to them simply as roots, as in *neur/o*. A combining vowel is usually not used if the ending begins with a vowel. For example, the root *neur* is combined with the suffix *-itis*, meaning "inflammation of," in this way:

neur + itis = neuritis (inflammation of a nerve)

This rule has some exceptions, particularly when they affect pronunciation or meaning, and you will observe these as you work.

# Word Derivations

As mentioned, most medical word parts come from Greek (G.) and Latin (L.). The original words and their meanings are included in this text only occasionally. However, they are interesting and may aid in learning. For example, *muscle* comes from a Latin word that means "mouse" because the movement of a muscle under the skin was thought to resemble the scampering of a mouse. The coccyx, the tail end of the spine, is named for the cuckoo because it was thought to resemble the cuckoo's bill (**Fig. 1-3**). For those interested in the derivations of medical words, a good medical dictionary will provide this information.

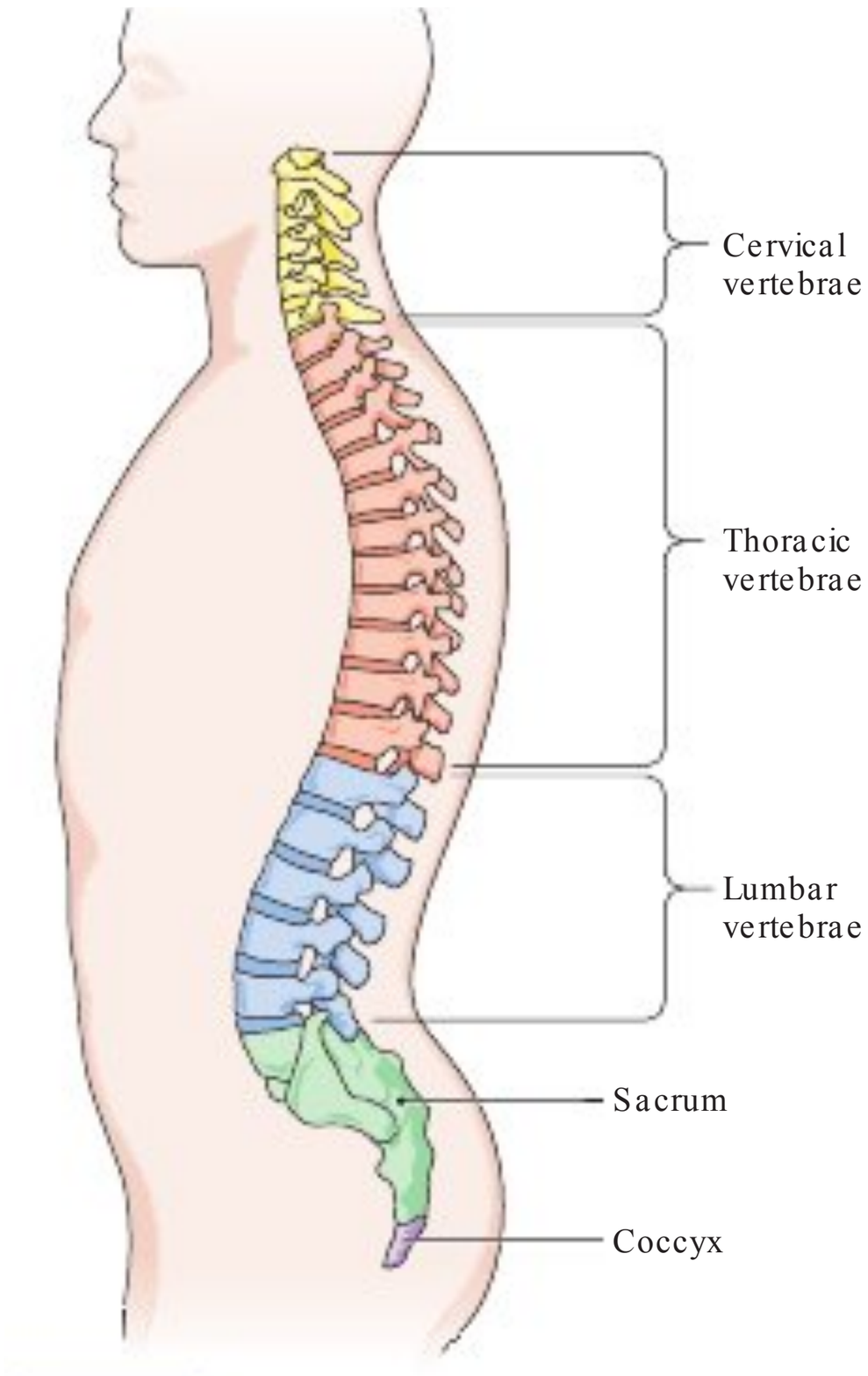



**Figure 1-3** **Word derivations.** The coccyx of the spine is named by its resemblance to a cuckoo's bill.

## WORDS ENDING IN x

When you add a suffix to a word ending in *x*, the *x* is changed to a *g* or a *c*. If there is a consonant before the *x*, such as *yx* or *nx*, the *x* is changed to a *g*. For example, *pharyn*x (throat) becomes *pharyngeal* (*fah-RIN-je-al*), to mean "pertaining to the throat;" *coccy*x (terminal portion of the spine) becomes *coccygeal* (*kok-SIJ-e-al*), to mean "pertaining to the coccyx."

If a vowel comes before the *x*, such as *ax* or *ix*, you change the *x* to a *c*. Thus, *thora*x (chest) becomes *thoracic* (*tho-RAS-ik*), to mean "pertaining to the chest;" and *cervi*x (neck) becomes *cervical* (*SER-vih-kal*), to mean "pertaining to a neck."

## SUFFIXES BEGINNING WITH rh

When you add a suffix beginning with *rh* to a root, the *r* is doubled. For example:

hem/o (blood) + -**r**hage (bursting forth) = hemo**rr**hage
(a bursting forth of blood)

men/o (menses) + -**r**hea (flow, discharge) = meno**rr**hea
(menstrual flow)

# Pronunciation

This text provides phonetic pronunciations at every opportunity, even in the answer keys. The web resource, thePoint, has a large audio pronunciation dictionary. Take advantage of these aids. Repeat each word aloud as you learn to recognize it in print or hear it in the Student Resources.

No special marks are needed to follow the pronunciation if you keep a few simple rules in mind. Any vowel that appears at the end of a syllable gets a long pronunciation:

*a* as in say
*e* as in tea
*i* as in lie
*o* as in hose
*u* as in sue

Any vowel that appears within a syllable gets a short pronunciation:

*a* as in hat
*e* as in met
*i* as in bin
*o* as in not
*u* as in run

If a vowel is at the end of a syllable but needs a short pronunciation, an *h* is added, as in vah-nil-ah for vanilla. If a vowel within a syllable needs a long pronunciation, an *e* is added, as in re-pete for repeat. The accented syllable in each word is shown with capital letters, as in *AK-sent*.

Box 1-2

1

## focus on Words

### Pronunciations

When pronunciations are included in a text, it is sometimes difficult for authors to know which pronunciation of a term to use. Pronunciations may vary from country to country and even in different regions of the same country. Think how easy it is to distinguish a Southern accent and one from the Midwest or Northeast United States. The general rule is to use the most common pronunciation or to list that pronunciation first if more than one is given.

The word *gynecology* is usually pronounced with a hard g in the United States, but in many areas, a soft g is used, as in *jin-eh-KOL-o-je*. Words pertaining to the cerebrum (largest part of the brain) may have an accent on different syllables. The adjective is usually pronounced with the accent on the second syllable (*seh-RE-bral*), but in cerebrum (*SER-eh-brum*) and cerebrospinal (*ser-eh-bro-SPI-nal*), the accented syllable differs.

The name for the first part of the small intestine (duodenum) is often pronounced *du-o-DE-num*, although the pronunciation *du-OD-eh-num* is also acceptable. And the scientific term for the navel, umbilicus, is usually pronounced with the accent on the second syllable as *um-BIL-ih-kus*, but *um-bih-LI-kus* is also used. When extreme, some alternative pronunciations can sound like a foreign language. The word we pronounce as *SKEL-eh-tal* is pronounced in some other English-speaking countries as *skeh-LE-tal*.

Be aware that word parts may change in pronunciation when they are combined in different ways. Note also that accepted pronunciations may vary from place to place. Only one pronunciation for each word is given here, but be prepared for differences, as noted in **Box 1-2**.

### Soft and Hard c and g

- A soft *c*, as in *racer*, will be written in pronunciations as *s* (*RA-ser*).
- A hard *c*, as in *candy*, will be written as *k* (*KAN-de*).
- A soft *g*, as in *page*, will be written as *j* (*paje*).
- A hard *g*, as in *grow*, will be written as *g* (*gro*).

### Silent Letters and Unusual Pronunciations

A silent letter or an unusual pronunciation can be a problem, especially if it appears at the start of a word that you are trying to look up in the dictionary. See **Box 1-3** for some examples.

The combinations in **Box 1-3** may be pronounced differently when they appear within a word, as in dia**gn**osis (*di-ag-NO-sis*), meaning determination of the cause of disease, in which the *g* is pronounced; a**pn**ea (*AP-ne-ah*), meaning cessation of breathing, in which the *p* is pronounced; nephro**pt**osis (*nef-rop-TO-sis*), meaning dropping of the kidney, in which the *p* is pronounced.

Go to the Audio Pronunciation Glossary on thePoint to hear medical terms pronounced.

### Learning Styles

The term *learning styles* describes how people differ in the senses on which they most depend to learn. Visual learners want to see a word in print. They like diagrams, charts, and pictures. Auditory learners need to hear words pronounced. They like to talk over what they have learned and benefit from listening again to recorded lessons. Tactile learners use touch, such as writing out answers or retyping notes. They like to follow demonstrations to learn a new skill.

Of course, we use all of our senses to some degree in learning, and the more channels we use, the more likely it is that we will absorb and remember new information. This text, in combination with the Student Resources, calls on multiple senses to aid learning: seeing new words in print, writing out answers, using flashcards, listening to pronunciations, and completing exercises on the computer. Unlike the fashion magazines that use perfumed ads to sell products, the olfactory sense has not yet been incorporated into textbooks. Perhaps someday Student Resources will have a smell feature!

## Abbreviations

Shortened words or initials can save time in writing medical reports and case histories. We commonly use TV for television, Jr. for junior, F for Fahrenheit temperature readings, UV for ultraviolet, and Dr. for doctor. A few of the many medical abbreviations are mL for the metric measurement milliliter; dB for decibels, units of sound intensity; CA for cancer; hgb for hemoglobin; and ECG for electrocardiogram.

### Phrase Abbreviations

An **acronym** is an abbreviation formed from the first letter of each word in a phrase. Some everyday acronyms are ASAP (as soon as possible), ATM (automated teller machine), and a computer's RAM (random access memory). Acronyms have become popular for saving time and space in naming objects, organizations, and procedures. They abound in the names of government agencies: FDA (Food and Drug Administration), USDA (United States

Box 1-3

## for Your reference

### silent letters and unusual Pronunciations

| Letter(s) | Pronunciation | Example | Definition of Example |
|---|---|---|---|
| ch | k | chemical *KEM-ih-kal* | pertaining to the elements and their interactions (root *chem/o* means "chemical") |
| dys | dis | dysfunction *dis-FUNK-shun* | difficult or abnormal (dys-) function |
| eu | u | euphoria *u-FOR-e-ah* | exaggerated feeling of well-being (*eu-* means "true" or "good") |
| gn | n | gnathic *NATH-ik* | pertaining to the jaw (gnath/o) |
| ph | f | phantom *FAN-tom* | illusion or imaginary image |
| pn | n | pneumonia *nu-MO-ne-ah* | inflammation of the lungs (pneumon/o) |
| ps | s | pseudonym *SU-do-nim* | false name (-nym) |
| pt | t | ptosis *TO-sis* | dropping, downward displacement |
| rh | r | rhinoplasty *RI-no-plas-te* | plastic repair of the nose (rhin/o) |
| x | z | xiphoid *ZI-foyd* | pertaining to cartilage attached to the sternum (from Greek *xiphos*, meaning "sword") |

Department of Agriculture), and NIH (National Institutes of Health). Some medical acronyms are BP for blood pressure, MRI for magnetic resonance imaging, AIDS for acquired immunodeficiency syndrome, CNS for the central nervous system, and RN for registered nurse. Acronyms and abbreviations that appear in a chapter are listed and defined at the end of that chapter. Appendix 2 is a more complete list of commonly used abbreviations and acronyms with their meanings. An abbreviation dictionary is also helpful.

## SYMBOLS

Symbols are commonly used as shorthand in case histories. Some examples are (l) and (r) for left and right and ↑ and ↓ for increase and decrease. A list of common symbols appears in Chapter 7 and in Appendix 1.

Symbols and abbreviations can save time, but they can also cause confusion if they are not universally understood. Usage varies in different institutions, and the same abbreviation may have different meanings in different fields. For example, the acronym CRF can mean chronic renal failure or case report form, and MS can represent mitral stenosis or multiple sclerosis. Again, as with roots having multiple meanings, if the acronym is not defined, its interpretation depends on its context.

Some abbreviations and symbols are subject to error and should never be used. These appear in "Do Not Use" lists published by organizations that promote patient safety, such as the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and the Institute for Safe Medical Practices (ISMP). Most institutions have a policy manual that details the accepted abbreviations for that facility. Only the most commonly used symbols and abbreviations are given here.

See the Student Resources on thePoint for a chart of selected "Do Not Use" abbreviations and the web addresses of organizations that publish these guidelines.

## Medical Dictionaries

With few exceptions, you can do all the exercises in this book without the aid of a dictionary, but medical dictionaries are valuable references for everyone in health-related fields. These include not only complete, unabridged versions, but also easy-to-carry short versions and dictionaries of medical acronyms and abbreviations. Many of these dictionaries are also available on CD, on the internet, and also as applications for smartphones. Dictionaries give information on meanings, pronunciation, synonyms, derivations, and related terms. Those dictionaries intended for nursing and allied health professions include more complete clinical information, with notes on patient care.

Dictionaries vary in organization; in some, almost all terms are entered as nouns, such as disease, syndrome, procedure, or test. Those with a more clinical approach enter some terms according to their first word, which may be an adjective or proper name, for example, biomedical engineering, Cushing disease, and wind chill factor. This format makes it easier to look up some terms. All dictionaries have directions on how to use the book and interpret the entries, as shown in Appendix 9, taken from *Stedman's Medical Dictionary*, 28th ed.

In addition to information on individual terms and phrases, medical dictionaries have useful appendices on measurements, clinical tests, drugs, diagnosis, body structure, information resources, and other topics.

## terminology Key terms

| | |
|---|---|
| acronym<br>*AK-ro-nim* | An abbreviation formed from the first letter of each word in a phrase |
| combining forms<br>*kom-BI-ning* | A word root combined with a vowel that links the root with another word part, such as a suffix or another root; combining forms are shown with a slash between the root and the vowel, as in *neur/o* |
| compound word<br>*KOM-pownd* | A word that contains more than one root |
| prefix<br>*PRE-fix* | A word part added before a root to modify its meaning |
| root<br>*rute* | The fundamental unit of a word |
| suffix<br>*SUH-fix* | A word part added to the end of a root to modify its meaning |

## Case Study Revisited

### J.V.'s Case Study Follow-Up

J.V. was scheduled for an esophageal gastroduodenoscopy as an outpatient procedure. The gastroenterologist was able to visualize the esophagus and the inside of the stomach. The area around the esophageal sphincter was a normal pink in color and showed no signs of esophagitis or ulceration. J.V. was started on a proton pump inhibitor to reduce stomach acid and was advised to limit his intake of spicy foods and alcohol. At his follow-up appointment, he reported no repeat episodes of epigastric pain.

CHa Pt Er 1

# Review

## Fill in the Blanks

1. A word part that always comes after a root is a(n) _____.
2. A root with a vowel added to aid in pronunciation is called a(n) _____.
3. Combine the word parts *dia-*, meaning "through," and *-rhea*, meaning "flow," to form a word meaning "passage of fluid stool" _____.
4. The abbreviation ETOH means (refer to Appendix 2) _____.
5. Use Appendix 3 to find that the suffix in *gastroduodenoscopy*, seen in J.V.'s opening case study, means _____.
6. Combine the root *cardi*, meaning "heart," with the suffix *-logy*, meaning "study of," to form a word meaning "study of the heart" _____.
7. Use Appendix 6 at the back of the book to find that the suffix *-al*, as in *esophageal*, seen in J.V.'s case study follow-up means _____.
8. Appendix 1 shows that the symbol ↑ means _____.

## Multiple Choice

Select the best answer and write the letter of your choice to the left of each number.

_____ **9.** *Epi-* in the term *epigastric* is a
- **a.** word root
- **b.** prefix
- **c.** suffix
- **d.** combining form

_____ **10.** The *-oid* in the term *xiphoid* is a
- **a.** root
- **b.** prefix
- **c.** derivation
- **d.** suffix

_____ **11.** The term *musculoskeletal* is a(n)
- **a.** abbreviation
- **b.** word root
- **c.** combining form
- **d.** compound word

_____ **12.** The adjective for *larynx* is
- **a.** larynxic
- **b.** laryngeal
- **c.** larynal
- **d.** largeal

_____ **13.** The combining form for *thorax* (chest) is
- **a.** thorax/o
- **b.** thor/o
- **c.** thorac/o
- **d.** thori/o