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an/o

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append/o

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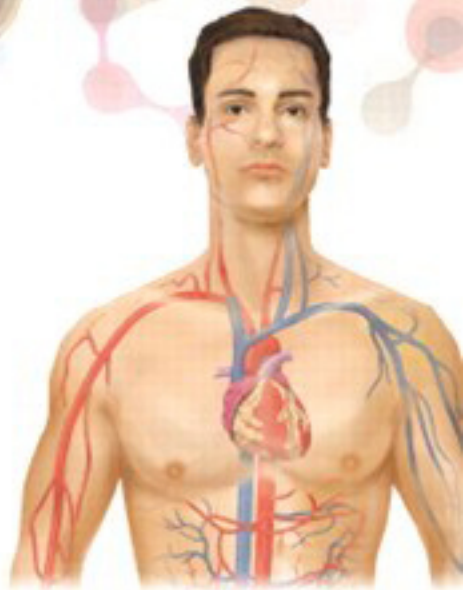
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Sixth Edition

Medical Terminology

A Living Language



Bonnie F. Fremgen

Suzanne S. Frucht



Brief Contents

- 1 Introduction To Medical Terminology 1
 - 2 Body Organization 21
 - 3 Integumentary System 47
 - 4 Musculoskeletal System 81
 - 5 Cardiovascular System 137
 - 6 Blood and the Lymphatic and Immune Systems 179
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Sixth Edition

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A Living Language

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Dedication

To my husband for his love and encouragement.

Bonnie Fremgen

To Rick, Kristin, and Chris for their love, support, and friendship. And especially to the newest member of our family, Adrienne.

Suzanne Frucht

To Danielle Doller, whose incredible editing skills (and friendship) have made each edition of this text better.

We would like to extend a special thank you to Garnet Tomich who went above and beyond to help make this edition shine.

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Library of Congress Cataloging-in-Publication Data

Fremgen, Bonnie F., author.

Medical terminology : a living language / Bonnie F. Fremgen, Suzanne S. Frucht. — Sixth edition.

p. ; cm.

Includes bibliographical references and index.

ISBN 978-0-13-407025-4 — ISBN 0-13-407025-9

I. Frucht, Suzanne S., author. II. Title.

[DNLM: 1. Medicine—Terminology—English. W 15]

R123

610.1'4—dc23

2015001788

10 9 8 7 6 5 4 3 2 1

PEARSON

ISBN-10: 0-13-407025-9
ISBN-13: 978-0-13-407025-4

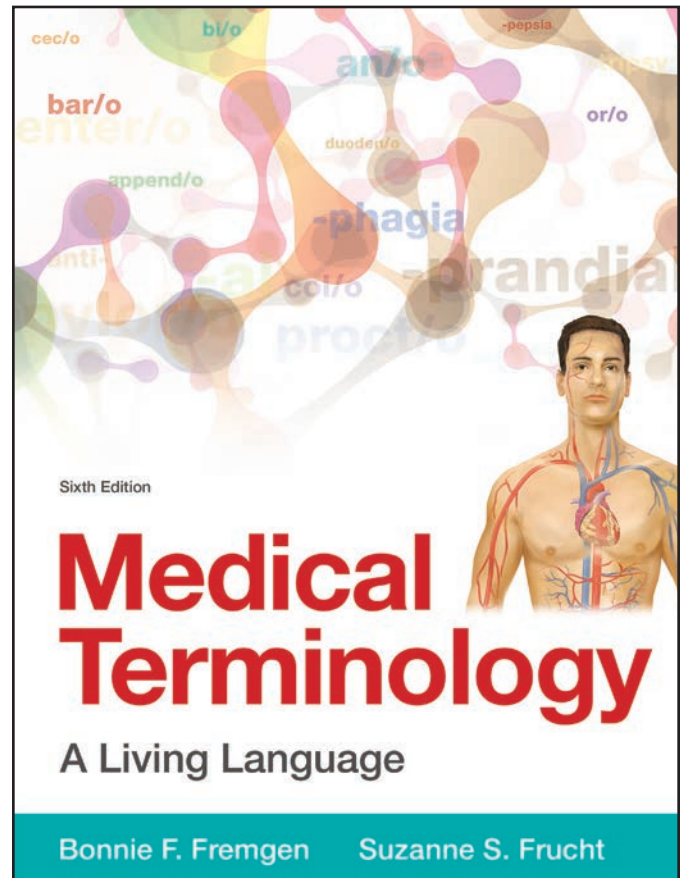
Welcome!

Welcome to the fascinating study of medical language—a vital part of your preparation for a career as a health professional. We are glad that you have joined us. Throughout your career, in a variety of settings, you will use medical terminology to communicate with coworkers and patients. Employing a carefully constructed learning system, *Medical Terminology: A Living Language* has helped thousands of readers gain a successful grasp of medical language within a real-world context.

In developing this book we had seven goals in mind:

1. To provide a clear introduction to the basic rules of using word parts to form medical terms.
2. To use phonetic pronunciations that will help you easily pronounce terms by spelling out the word part according to the way it sounds.
3. To help you understand medical terminology within the context of the human body systems. Realizing that this book is designed for a terminology course and not an anatomy and physiology course, we have aimed to stick to only the basics.
4. To help you develop a full range of Latin and Greek word parts used to build medical terms so that you will be able to interpret unfamiliar terms you encounter in the future.
5. To help you visualize medical language with an abundance of real-life photographs and accurate illustrations.
6. To provide you with a wealth of practice applications at the end of each chapter to help you review and master the content as you go along.
7. To create rich multimedia practice opportunities for you by way of MyMedicalTerminologyLab.

Please turn the page to get a visual glimpse of what makes this book an ideal guide to your exploration of medical terminology.



A Guide to What Makes This Book Special

Streamlined Content

Fourteen chapters and only the most essential anatomy and physiology coverage make this book a perfect mid-sized fit for a one-term course.

Brief Contents

- 1 Introduction To Medical Terminology 1
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Chapter-Opening Page Spreads

“At a Glance” and “Illustrated” pages begin each chapter, providing a quick, visual snapshot of what’s covered.

Integumentary System at a Glance

Function
The skin provides a protective two-way barrier between our internal environment and the outside world. It also plays an important role in temperature regulation, houses sensory receptors to detect the environment around us, and secretes important fluids.

Organs
Here are the primary structures that comprise the integumentary system.
skin hair nails sebaceous glands sweat glands

Word Parts
Here are the most common word parts (with their meanings) used to build integumentary system terms. For a more comprehensive list, refer to the Terminology section of this chapter.

Combining Forms

albin/o white	myc/o fungus
cauter/o to burn	necr/o death
cry/o cold	onych/o nail
cutane/o skin	pedicul/o lice
derm/o skin	phot/o light
dermat/o skin	py/o pus
diaphor/o profuse sweating	rhytid/o wrinkle
electr/o electricity	sarc/o flesh
erythr/o red	scler/o hard
hidr/o sweat	seb/o oil
ichthy/o scaly, dry	system/o system
kerat/o hard, horny	trich/o hair
leuk/o white	ungu/o nail
lip/o fat	vesic/o sac, bladder
melan/o black	xer/o dry

Suffixes
-derma skin condition

Prefixes
allo- other, different from usual
xeno- foreign

Integumentary System Illustrated

skin, p. 50
Protective barrier, houses sensory receptors, secretes sweat and sebum, temperature regulation

hair, p. 52
Provides some protection; associated with sensory receptors

nail, p. 53
Covers and protects tips of digits

Key Terms and Pronunciations

Every subsection starts with a list of key terms and pronunciations for those words that will be covered in that section. This sets the stage for comprehension and mastery.

Color-Coded Word Parts—Red combining forms, blue suffixes, and green prefixes allow for quick recognition throughout the book.

NEW! Informative and Interesting Sidebars

The popular Med Term Tip feature offers tidbits of noteworthy information about medical terms that engage learners. New features for the sixth edition are Word Watch and What's In A Name?, which further assist students as they learn medical terminology by helping them not to confuse similar-sounding words and by reinforcing word parts.

Medically Accurate Illustrations

Concepts come to life with vibrant, clear, consistent, and scientifically precise images.

Digestive System 269

mixes with hydrochloric acid and other gastric juices to form a liquid mixture called **chyme**, which then passes through the remaining portion of the digestive system.

Entry into and exit from the stomach is controlled by muscular valves called **sphincters**. These valves open and close to ensure that food can only move forward down the gut tube. The **cardiac sphincter**, named for its proximity to the heart, is located between the esophagus and the stomach; also called the **lower esophageal sphincter (LES)**, it keeps food from flowing backward into the esophagus.

The antrum tapers into the **pyloric sphincter**, which regulates the passage of food into the small intestine. Only a small amount of the chyme is allowed to enter the small intestine with each opening of the sphincter for two important reasons. First, the small intestine is much narrower than the stomach and cannot hold as much as the stomach can. Second, the chyme is highly acidic and must be thoroughly neutralized as it leaves the stomach.

Small Intestine
duodenum (doo-oh-DEE-num / doo-OD-eh-num) [joo-n] (JL-ee-um)
jejunum (jil-JOO-num)
ileocecal valve (ill-ee-oh-SEE-kal)

The small intestine, or small bowel, is the major site of digestion and absorption of nutrients from food. It is located between the pyloric sphincter and the colon (see Figure 8.6). Because the small intestine is concerned with absorption of food products, an abnormality in this organ can cause malnutrition. The small intestine, with an average length of 20 feet, is the longest portion of the alimentary canal and has three sections: the **duodenum**, the **jejunum**, and the **ileum**.

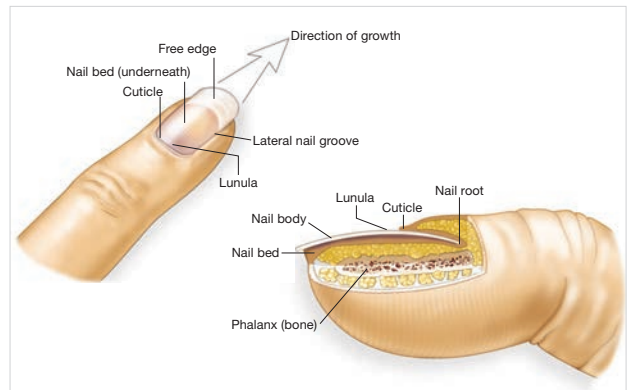
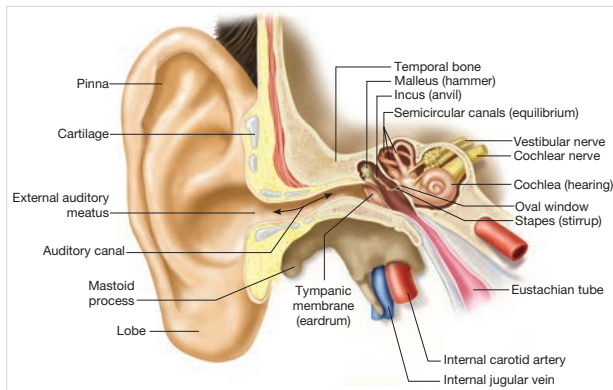
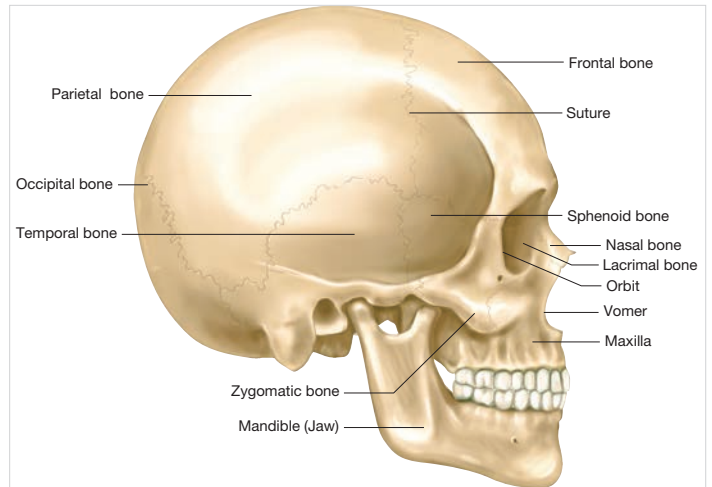
- The duodenum extends from the pyloric sphincter to the jejunum, and is about 10–12 inches long. Digestion is completed in the duodenum after the liquid chyme from the stomach is mixed with digestive juices from the pancreas and gallbladder.
- The jejunum, or middle portion, extends from the duodenum to the ileum and is about eight feet long.

What's In A Name?
 Look for these word parts:
 cardio = heart
 hydro = water
 -ile = pertaining to

Med Term Tip
 It is easier to remember the function of the pyloric sphincter when you note that **pyloro** means "gatekeeper." The gatekeeper controls the forward movement of food. Sphincters are rings of muscle that can be opened and closed to control entry and exit from hollow organs like the stomach, colon, and bladder.

Word Watch
 Be careful not to confuse the word root **ileo** meaning "ileum," a portion of the small intestine, and **ileo** meaning "ilium," a pelvic bone.

Figure 8.6 The small intestine. Anterior view of the abdominopelvic cavity illustrating how the three sections of small intestine—duodenum, jejunum, ileum—begin at the pyloric sphincter and end at the colon, but are not arranged in a orderly fashion.



Word Tables

Study lists are categorized and presented in a clear, logical, color-coded format that eases the learning process. The Signs and Symptoms subsection within the Pathology table contains disease-related terms grouped by organ. This allows terms to be categorized into smaller groups, therefore making learning easier. Also the three-column format in the Word Building sections allows for the term (with pronunciation and/or abbreviation), word parts (if appropriate), and definitions to be displayed. The Pharmacology table also includes word parts in a fourth column.

Terminology

Word Parts Used to Build Male Reproductive System Terms

The following lists contain the combining forms, suffixes, and prefixes used to build terms in the remaining sections of this chapter.

Combining Forms

andr/o male	oligo/o scanty	spermat/o sperm
balan/o glans penis	orch/o testes	testicul/o testicle
carcin/o cancer	orchid/o testes	ur/o urine
crypt/o hidden	orchid/o testes	urethr/o urethra
epididym/o epididymis	pen/o penis	varic/o dilated vein
genit/o genital	prostat/o prostate gland	vas/o vas deferens
hydr/o water	rect/o rectum	vesicul/o seminal vesicle
immun/o protection		

Suffixes

-al pertaining to	-ile pertaining to	-ostomy create a new opening
-ar pertaining to	-ism state of	-otomy cutting into
-cele protrusion	-itis inflammation	-pexy surgical fixation
-cide to kill	-logy study of	-plasia formation of cells
-ectomy surgical removal	-lysis destruction	-plasty surgical repair
-gen that which produces	-oid resembling	-rrhea discharge
-iasis abnormal condition	-oma tumor	-sperma sperm condition
-ic pertaining to	-osis abnormal condition	

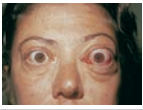
Prefixes

a- without	dys- abnormal	hypo- below
an- without	epi- above	trans- across
anti- against	hyper- excessive	

Adjective Forms of Anatomical Terms

Term	Word Parts	Definition
conjunctival (kon-JUNK-tih-vul)	conjunctiv/o = conjunctiva -al = pertaining to	Pertaining to the conjunctiva.
corneal (KOR-nee-al)	corn/eo = cornea -al = pertaining to <i>Word Tables</i> corneo = pertaining to the combining form cornea meaning "horn" and cornea meaning "cornea."	Pertaining to the cornea.
extraocular (EK-struh-OK-yoo-lar)	extra- = outside of ocul/o = eye -ar = pertaining to	Pertaining to being outside the eyeball, for example, the extraocular eye muscles.
irital (ir-id-ah)	iritid/o = iris -al = pertaining to	Pertaining to the iris.
lacrimal (LAK-rim-al)	lacrim/o = tears -al = pertaining to	Pertaining to tears.
macular (MAK-oolar)	macul/o = macula lutea -ar = pertaining to	Pertaining to the macula.
ocular (OK-oo-lar)	ocul/o = eye -ar = pertaining to	Pertaining to the eye.
intraocular (in-truh-OK-yoo-lar)	intra- = within ocul/o = eye -ar = pertaining to	Pertaining to within the eye.
ophthalmic (of-thal-mik)	ophthalm/o = eye -ic = pertaining to	Pertaining to the eye.
optic (OP-ik)	opt/o = eye, vision -ic = pertaining to	Pertaining to the eye or vision.
optical (OP-tih-ah)	opt/o = eye, vision -al = pertaining to	Pertaining to the eye or vision.
pupillary (PYOO-pih-lair-ee)	pupill/o = pupil -ary = pertaining to	Pertaining to the pupil.
retinal (RET-ih-al)	retin/o = retina -al = pertaining to	Pertaining to the retina.
scleral (SKLER-ah)	scler/o = sclera -al = pertaining to	Pertaining to the sclera.

Pathology (continued)

Term	Word Parts	Definition
adrenopathy (ad-ren-OP-ah-thee)	adren/o = adrenal gland -pathy = disease	General term for adrenal gland disease.
edema (eh-DEE-mah)	<i>Word Tables</i> edem = swelling -edema	Condition in which the body tissues contain excessive amounts of fluid.
endocrinopathy (en-doh-kroh-OP-ah-thee)	endo- = within crin/o = to secrete -pathy = disease	General term for diseases of the endocrine system.
exophthalmos (eks-of-thal-mohs)	ex- = outward ophthalm/o = eye	Condition in which the eyeballs protrude, such as in Graves' disease. This is generally caused by an overproduction of thyroid hormone.
 <p>Figure 11-11 A photograph of a woman with exophthalmos. This condition is associated with hypersecretion of the thyroid gland. (From Medical Terminology, 10th ed.)</p>		
glycosuria (glye-kohs-YOO-ree-ah)	glycos/o = sugar -uria = urine condition	Having a high level of sugar excreted in the urine.
gynecomastia (gih-neh-koh-MAST-ee-ah)	gyneco- = female mas/o = breast -ia = condition	Development of breast tissue in males. May be a symptom of adrenal feminization.
hirsutism (HER-soot-izm)	hirs- = state of	Condition of having an excessive amount of hair. Term generally used to describe females who have the adult male pattern of hair growth. Can be the result of a hormonal imbalance.
hypercalcemia (high-per-SEE-mee-ah)	hyper- = excessive calcio- = calcium	Condition of having a high level of calcium in the blood, associated with hypersecretion of parathyroid hormone.
hypocalcemia	hypo- = below calcio- = calcium	Condition of having a low level of calcium in the blood, associated with diabetes mellitus.
hypercalcemia	hyper- = excessive calcio- = calcium	Condition of having a high level of calcium in the blood, associated with hypersecretion of parathyroid hormone.
hypocalcemia	hypo- = below calcio- = calcium	Condition of having a low level of calcium in the blood, associated with diabetes mellitus.

Abbreviations

AE above elbow	NSAID nonsteroidal anti-inflammatory drug
AK above knee	OA osteoarthritis
BDT bone density testing	ORIF open reduction-internal fixation
BE below elbow	Orth, ortho orthopedics
BK below knee	P phosphorus
C1, C2, etc. first cervical vertebra, second cervical vertebra, etc.	RA rheumatoid arthritis
Cox coxa	RLE right lower extremity
Gen generative joint disease	RUE right upper extremity
Al-en all-energy absorptiometry	SLE systemic lupus erythematosus
Clure clure	T1, T2, etc. first thoracic vertebra, second thoracic vertebra, etc.
MNP mixed nucleus pulposus	THA total hip arthroplasty
RA sterile rheumatoid arthritis	THR total hip replacement
L4, L5 4th lumbar vertebra, second lumbar vertebra, etc.	TKA total knee arthroplasty
Ext extremity	TKR total knee replacement
L lower extremity	UE upper extremity
U upper extremity	

Pharmacology

Classification	Word Parts	Action	Examples
anesthetic ophthalmic solution (of-thal-mik)	an- = without esthes/o = sensation, feeling -ic = pertaining to ophthalm/o = eye -ic = pertaining to	Eye drops for pain relief associated with eye infections, corneal abrasions, or surgery.	proparacain, Ak-Taine, Ocu-Caine; tetracaine, Opticaine, Portobac
antibiotic ophthalmic solution (of-thal-mik)	anti- = against bi/o = life -ic = pertaining to ophthalm/o = eye -ic = pertaining to	Eye drops for the treatment of bacterial eye infections.	erythromycin, Del-tacortol, Tobacin
antiglaucoma medications (an-glu-KOH-mah)	anti- = against glau/o = gray coma = mass	Reduce intraocular pressure by lowering the amount of aqueous humor in the eyeball. May achieve this by either reducing the production of aqueous humor or increasing its outflow.	timolol, Betimol, Timoptic; acetazolamide, Ak-Zol, Dazamide; prostaglandin analogs, Lumigan, Xalatan
artificial tears		Medications, many of them over the counter, to treat dry eyes.	buffered isotonic solutions, Avisa Tears, Refresh Plus, Moisture Eyes
miotic drops (my-OT-ik)	mi/o = lessening -ic = pertaining to	Any substance that causes the pupil to constrict. These medications may also be used to treat glaucoma.	physostigmine, Esenerin Sulfate, Isopto Esenerin, Carbachol, Carbastat, Pilocarpine

Diagnostic Procedures


Term	Word Parts	Definition
auscultation (oss-kul-TAY-shun)		Process of listening to the sounds of the body by using a stethoscope.
sphygmomanometer (sif-ig-moh-mah-NOM-eh-ter)	sphygm/o = pulse manometer = instrument to measure pressure	Instrument for measuring blood pressure (BP). Also referred to as a blood pressure cuff.
		
stethoscope (STETH-oh-scope)	steth/o = chest -scope = instrument for viewing	Instrument for listening to body sounds (auscultation), such as the chest, heart, and intestines.

Figure 8-17 Using a sphygmomanometer to measure blood pressure.

Therapeutic Procedures

Term	Word Part	Definition
Medical Treatments		
arthrocentesis (ar-throh-sen-TEE-sis)	arthr/o = joint -centesis = puncture to withdraw fluid	Involves the insertion of a needle into the joint cavity in order to remove or aspirate fluid. May be done to remove excess fluid from a joint or to obtain fluid for examination.
orthotic (or-thoh-TIK)	orth/o = straight -ic = pertaining to	Orthopedic appliance, such as a brace or splint, used to prevent or correct deformities.
prosthesis (pross-THEE-sis)	prosth/eo = addition	Artificial device used as a substitute for a body part that is either congenitally missing or absent as a result of accident or disease. An example would be an artificial leg.
Surgical Procedures		
amputation (am-pyoo-TAY-shun)		Partial or complete removal of a limb for a variety of reasons, including tumors, gangrene, intractable pain, crushing injury, or uncontrollable infection.
arthroclasia (ar-throh-KLAY-see-ah)	arthr/o = joint -clasia = surgically break	To forcibly break loose a fused joint while the patient is under anesthesia. Fusion is usually caused by the buildup of scar tissue or adhesions.
arthrodesis (ar-throh-DEE-sis)	arthr/o = joint -desis = to fuse	Procedure to stabilize a joint by fusing the bones together.
arthroscopic surgery (ar-throh-SKOP-ik)	arthr/o = joint -scopy = process of visually examining -ic = pertaining to	Performing a surgical procedure while using an arthroscope to view the internal structure, such as a joint.
arthrotomy (ar-throh-TOH-mee)	arthr/o = joint -otomy = cutting into	Surgical procedure that cuts into a joint capsule.
bone graft		Place of bone taken from the patient used to take the place of a removed bone or a bony defect at another site.

NEW! Practice As You Go

A mix of exercises peppered throughout the chapters to help you take a quick assessment of your understanding of the material discussed.

Practice As You Go

C. Terminology Matching

Match each term to its definition.

- | | |
|-------------------------------------|---|
| 1. _____ Wilms' tumor | a. kidney stones |
| 2. _____ azotemia | b. feeling the need to urinate immediately |
| 3. _____ urinary retention | c. childhood malignant kidney tumor |
| 4. _____ nephroptosis | d. swelling of the kidney due to urine collecting in the renal pelvis |
| 5. _____ nocturia | e. involuntary release of urine |
| 6. _____ incontinence | f. frequent urination at night |
| 7. _____ hydronephrosis | g. excess nitrogenous waste in bloodstream |
| 8. _____ urgency | h. inability to fully empty bladder |
| 9. _____ nephrolithiasis | i. a floating kidney |
| 10. _____ polycystic kidney disease | j. multiple cysts in the kidneys |

Practice As You Go

A. Complete the Statement

- The study of the heart is called _____.
- The three layers of the heart are _____, _____, and _____.
- The impulse for the heartbeat (the pacemaker) originates in the _____.
- Arteries carry blood _____ the heart.
- The four heart valves are _____, _____, _____, and _____.
- The _____ are the receiving chambers of the heart and the _____ are the pumping chambers.
- The _____ circulation carries blood to and from the lungs.
- The pointed tip of the heart is called the _____.
- The _____ divides the heart into left and right halves.
- _____ is the contraction phase of the heartbeat and _____ is the relaxation phase.

Practice As You Go

B. Give the adjective form for each anatomical structure

- Blood _____ or _____
- White cell _____
- Clotting cell _____
- Fibers _____
- Red cell _____

Practice As You Go

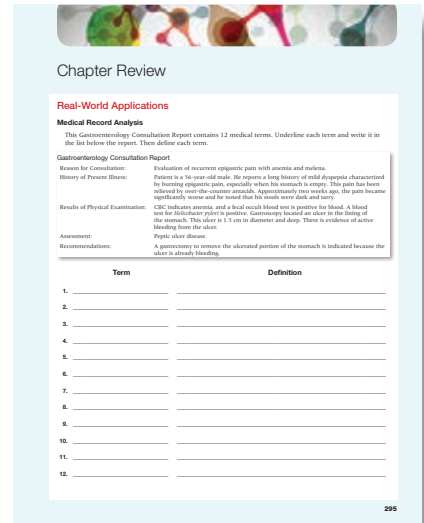
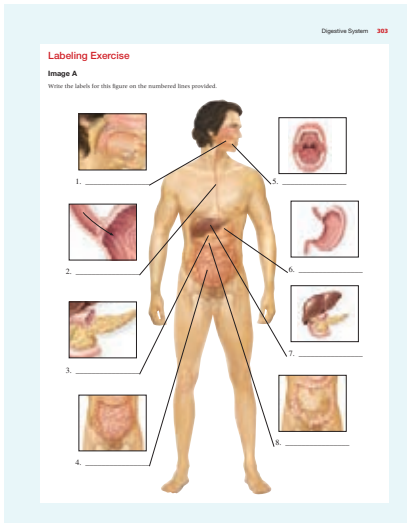
E. What Does it Stand For?

- KUB _____
- cath _____
- cysto _____
- GU _____
- ESWL _____
- UTI _____
- UC _____
- RP _____
- ARF _____
- BUN _____
- CRF _____
- H₂O _____

Chapter Review

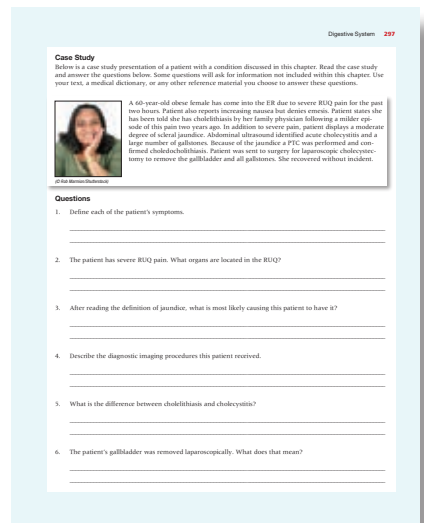
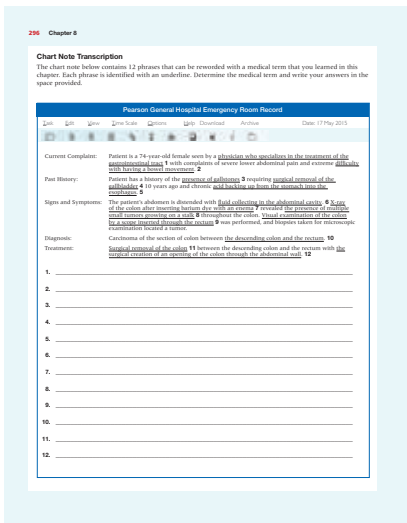
Practice Exercises—A wide array of workbook exercises at the end of each chapter serve as a fun and challenging study review.

Real-World Applications—Three critical thinking activities allow students to apply their medical knowledge to true-to-life scenarios:



Additionally Labeling Exercises provide a visual challenge to reinforce students' grasp of anatomy and physiology concepts.

1) Medical Record Analysis Exercises that challenge students to read examples of real medical records and then to apply their medical terminology knowledge in answering related questions.



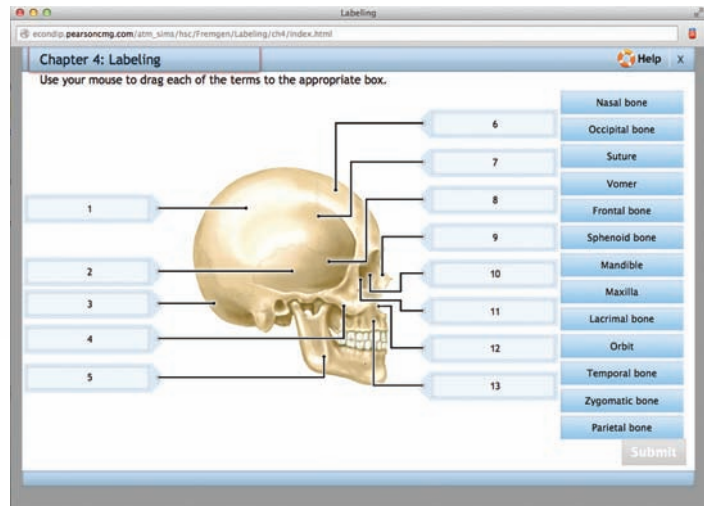
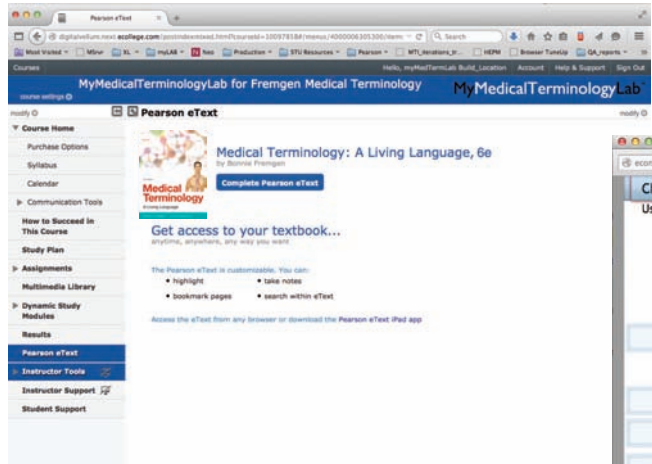
2) Chart Note Transcription Slice-of-real-life exercise that asks students to replace lay terms in a medical chart with the proper medical term.

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Preface

Since the first edition of *Medical Terminology: A Living Language* was published it has been noted for its “clean” and logical format that promotes learning. In this revised edition, we have built upon this strength by enhancing many features to make this text an ideal choice for semester- or quarter-length courses.

Features of this Edition

This new sixth edition contains features that facilitate student mastery, while maintaining the best aspects of previous editions. Each chapter is arranged in a similar format and the content is organized with an emphasis on maintaining consistency and accuracy. All terms have been evaluated to ensure they remain in current use and reflect the newest technologies and procedures.

We have revised *Medical Terminology: A Living Language* so that it provides for an even more valuable teaching and learning experience. Here are the enhancements we have made:

- The Terminology section includes a comprehensive list of all combining forms, suffixes, and prefixes used to build terms in the remaining sections of the chapter.
- The popular Med Term Tip margin note has been expanded to include two additional features called **What’s In A Name?** and **Word Watch**. **Word Watch** points out words that may confuse students due to similar sound or similar spelling and **What’s In A Name?** reinforces the breakdown of word parts used in the section being discussed.
- **Practice As You Go** is a “speed bump” feature scattered throughout the chapters that allows the reader to get a quick check on their grasp of the content presented by using a combination of short-answer exercises. Answers are provided at the back of the book.

Organization of the Book

Introductory Chapter

Chapter 1 contains information necessary for an understanding of how medical terms are formed. This includes learning about word roots, combining forms, prefixes, and suffixes, and general rules for building medical terms. Readers will also learn about terminology for medical records and the different healthcare settings. Chapter 2 presents terminology relating to the body organization, including organs and body systems. Here readers will first encounter word-building tables, a feature found in each remaining chapter that lists medical terms and their respective word parts.

Anatomy and Physiology Chapters

Chapters 3–13 are organized by body system. Each chapter begins with the System At A Glance feature, which lists combining forms, prefixes, and/or suffixes with their meanings and is followed by a System Illustrated overview of the organs in the system. The anatomy and physiology section is divided into the various components of the system, and each subsection begins with a list of key medical terms accompanied by a pronunciation guide. Key terms are boldfaced the first time they appear in the narrative. The Terminology section of each chapter begins with a list of all word parts used within the chapter. For ease of learning, the medical terms are divided into five separate sections: adjective forms of anatomical terms, pathology, diagnostic procedures, therapeutic procedures, and pharmacology. The word parts used to build terms are highlighted within each table. An abbreviations section then follows to complete the chapter.

Special Topics Chapter

Chapter 14 contains timely information and appropriate medical terms relevant to the following medical specialties: pharmacology, mental health, diagnostic imaging, rehabilitation services, surgery, and oncology. Knowledge of these topics is necessary for the well-rounded healthcare worker.

Appendices

The appendices contain helpful reference lists of word parts and definitions. This information is intended for quick access. There are three appendices: Word Parts Arranged Alphabetically and Defined, Word Parts Arranged Alphabetically by Definition, and Abbreviations. Finally, all of the key terms appear again in the combination glossary/index at the end of the text.



About the Authors



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Bonnie F. Fremgen is a former Associate Dean of the Allied Health Program at Robert Morris College. She has taught medical law and ethics courses as well as clinical and administrative topics. In addition, Dr. Fremgen has served as an advisor for students' career planning. She has broad interests and experiences in the healthcare field, including hospitals, nursing homes, and physicians' offices.

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Marcelo Oliver is president and founder of Body Scientific International LLC. He holds an MFA degree in Medical and Biological Illustration from the University of Michigan. For the past 15 years, his passion has been to condense complex anatomical information into visual education tools for students, patients, and medical professionals. For seven years Oliver worked as a medical illustrator and creative director developing anatomical charts used for student and patient education. In the years that followed, he created educational and marketing tools for medical device companies prior to founding Body Scientific International, LLC.

Body Scientific's lead artists in this publication were medical illustrators Liana Bauman and Katie Burgess. Both hold a Master of Science degree in Biomedical Visualization from the University of Illinois at Chicago. Their contribution in the publication was key in the creation and editing of artwork throughout.



Our Development Team

We would like to express deep gratitude to the over 100 colleagues from schools across the country that have provided us with many hours of their time over the years to help us tailor this book to suit the dynamic needs of instructors and students. These individuals have reviewed manuscript chapters and illustrations for content, accuracy, level, and utility. We sincerely thank them and feel that *Medical Terminology: A Living Language* has benefited immeasurably from their efforts, insights, encouragement, and selfless willingness to share their expertise as educators.

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A Commitment to Accuracy

As a student embarking on a career in healthcare you probably already know how critically important it is to be precise in your work. Patients and coworkers will be counting on you to avoid errors on a daily basis. Likewise, we owe it to you—the reader—to ensure accuracy in this book. We have gone to great lengths to verify that the information provided in *Medical Terminology: A Living Language* is complete and correct. To this end, here are the steps we have taken:

1. **Editorial Review**—We have assembled a large team of developmental consultants (listed on the preceding pages) to critique every word and every image in this book. Multiple content experts have read each chapter for accuracy.
2. **Medical Illustrations**—A team of medically trained illustrators was hired to prepare each piece of art that graces the pages of this book. These illustrators have a higher level of scientific education than the artists for most textbooks, and they worked directly with the authors and members of our development team to make sure that their work was clear, correct, and consistent with what is described in the text.
3. **Accurate Ancillaries**—Realizing that the teaching and learning ancillaries are often as vital to instruction as the book itself, we took extra steps to ensure accuracy and consistency within these components. We assigned some members of our development team to specifically focus on critiquing every bit of content that comprises the instructional ancillary resources to confirm accuracy.

While our intent and actions have been directed at creating an error-free text, we have established a process for correcting any mistakes that may have slipped past our editors. Pearson takes this issue seriously and therefore welcomes any and all feedback that you can provide along the lines of helping us enhance the accuracy of this text. If you identify any errors that need to be corrected in a subsequent printing, please notify us. Thank you for helping Pearson to reach its goal of providing the most accurate medical terminology textbooks available.



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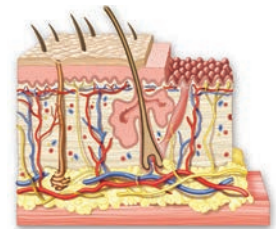
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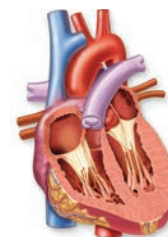
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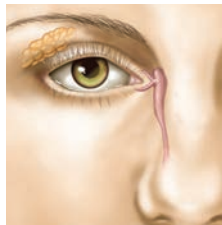
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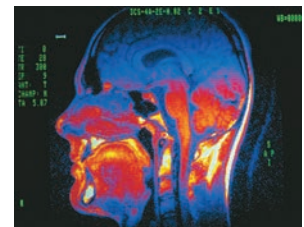
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Sixth Edition

Medical Terminology

A Living Language

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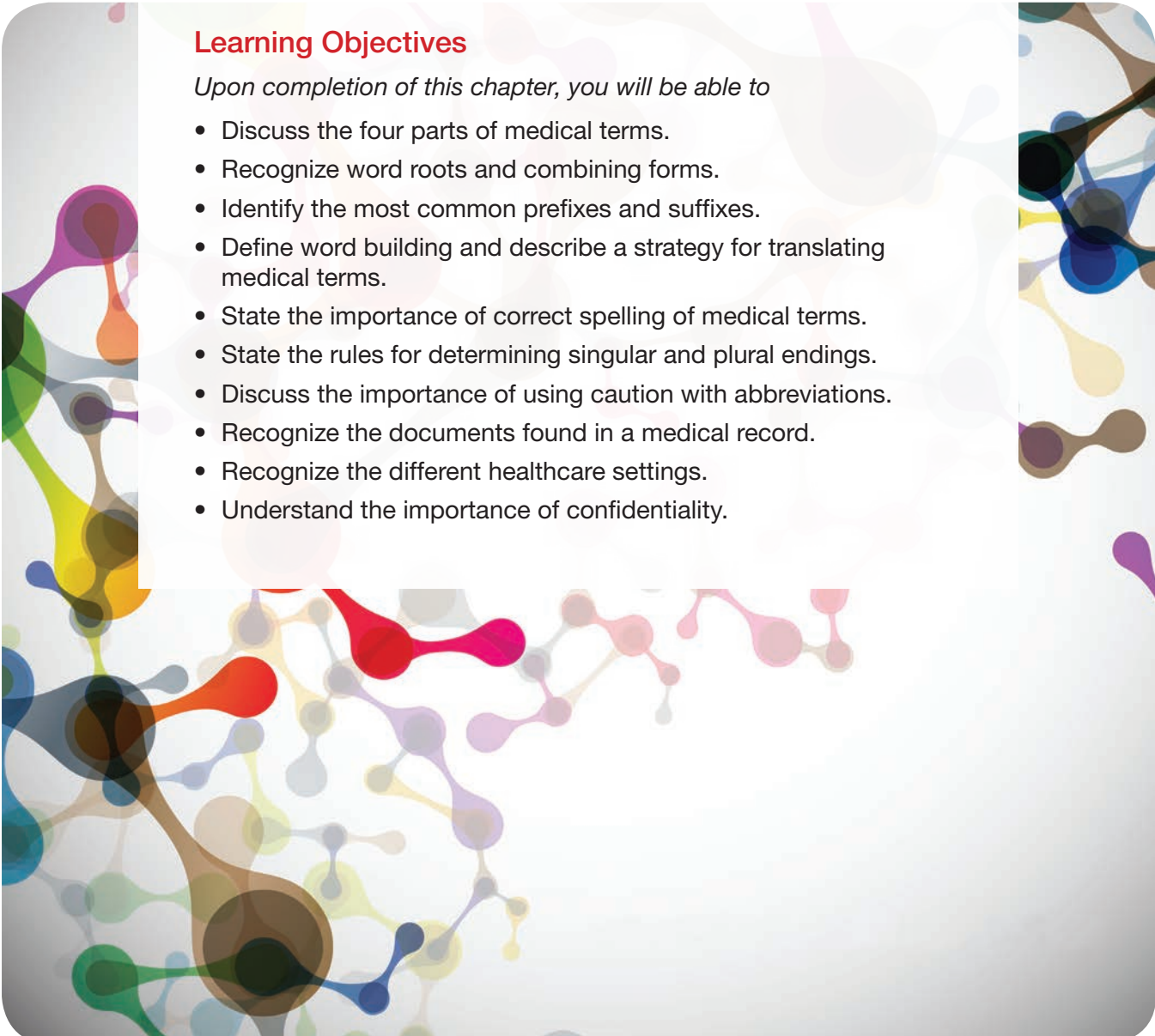


1

Introduction to Medical Terminology

Learning Objectives

Upon completion of this chapter, you will be able to

- Discuss the four parts of medical terms.
 - Recognize word roots and combining forms.
 - Identify the most common prefixes and suffixes.
 - Define word building and describe a strategy for translating medical terms.
 - State the importance of correct spelling of medical terms.
 - State the rules for determining singular and plural endings.
 - Discuss the importance of using caution with abbreviations.
 - Recognize the documents found in a medical record.
 - Recognize the different healthcare settings.
 - Understand the importance of confidentiality.
- 

Medical Terminology at a Glance

Learning medical terminology can initially seem like studying a strange new language. However, once you understand some of the basic rules about how medical terms are formed using word building, it will become much like piecing together a puzzle. The general guidelines for forming words; an understanding of word roots, combining forms, prefixes, and suffixes; pronunciation; and spelling are discussed in this chapter. Chapter 2 introduces you to terms that are used to describe the body as a whole. Chapters 3–13 each focus on a specific body system and present new combining forms, prefixes, and suffixes, as well as exercises to help you gain experience building new medical terms. Finally, Chapter 14 includes the terminology for several important areas of patient care. Additionally, sprinkled throughout all chapters are “Med Term Tips” to assist in clarifying some of the material, “Word Watch” boxes to point out terms that may be particularly confusing, and “What’s In A Name?” boxes to highlight the word parts found in the text. New medical terms to be discussed in each section are listed separately at the beginning of the section, and each chapter contains numerous pathological, diagnostic, treatment, and surgical terms. You should use these lists as an additional study tool for previewing and reviewing terms.

Understanding medical terms requires you being able to put words together or build words from their parts. It is impossible to memorize thousands of medical terms; however, once you understand the basics, you can distinguish the meaning of medical terms by analyzing their prefixes, suffixes, and word roots. Remember that there will always be some exceptions to every rule, and medical terminology is no different. We attempt to point out these exceptions where they exist. Most medical terms, however, do follow the general rule that there is a **word root** (indicated by a red color) or fundamental meaning for the word, a **prefix** (indicated by a green color) and a **suffix** (indicated by a blue color) that modify the meaning of the word root, and sometimes a **combining vowel** to connect other word parts. You will be amazed at the seemingly difficult words you will be able to build and understand when you follow the simple steps in word building (see Figure 1.1 ■).



■ **Figure 1.1** Nurse completing a patient report. Healthcare workers use medical terminology in order to accurately and efficiently communicate patient information to each other. (Monkey Business Images/Shutterstock)