



Seventh Edition

Medical Terminology

A LIVING LANGUAGE

Bonnie F. Fremgen, PhD

Former Associate Dean

Allied Health Program

Robert Morris College

Chicago, IL

Suzanne S. Frucht, PhD

Associate Professor Emeritus

Northwest Missouri State University

Maryville, MO



Pearson

330 Hudson Street, New York, NY 10013

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DEDICATION

To my husband for his love and encouragement.
Bonnie Fremgen

To my granddaughter, Adrienne, who every day
brings a smile to my face.

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

I would like to extend a special thank you to Garnet
Tomich who added to her normal workload by
taking on the immense task of double-checking
the pronunciations of every term in this edition and
updating them as needed to ensure consistency.

Suzanne Frucht

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A Guide to What Makes This Book Special

Streamlined Content

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

Brief Contents

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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.

CARDIOVASCULAR SYSTEM	Cardiovascular System Illustrated																																																																														
<p>AT A GLANCE</p> <p>Function The cardiovascular system consists of the pump and vessels that distribute blood to all areas of the body. This system allows for the delivery of needed substances to the cells of the body as well as for the removal of wastes.</p> <p>Organs The primary structures that comprise the cardiovascular system:</p> <table> <tr> <td>blood vessels</td> <td>heart</td> </tr> <tr> <td>• arteries</td> <td></td> </tr> <tr> <td>• capillaries</td> <td></td> </tr> <tr> <td>• veins</td> <td></td> </tr> </table> <p>Word Parts Presented here are the most common word parts (with their meanings) used to build cardiovascular system terms. For a more comprehensive list, refer to the Terminology section of this chapter.</p> <p>Combining Forms</p> <table> <tr> <td>angi/o</td><td>vessel</td><td>sept/o</td><td>wall</td></tr> <tr> <td>aort/o</td><td>aorta</td><td>son/o</td><td>sound</td></tr> <tr> <td>arteri/o</td><td>artery</td><td>sphygm/o</td><td>pulse</td></tr> <tr> <td>arteriol/o</td><td>arteriole</td><td>steth/o</td><td>chest</td></tr> <tr> <td>ather/o</td><td>fatty substance</td><td>thromb/o</td><td>clot</td></tr> <tr> <td>atri/o</td><td>atrium</td><td>valv/o</td><td>valve</td></tr> <tr> <td>cardi/o</td><td>heart</td><td>valvul/o</td><td>valve</td></tr> <tr> <td>coron/o</td><td>heart</td><td>varic/o</td><td>dilated vein</td></tr> <tr> <td>embol/o</td><td>plug</td><td>vascul/o</td><td>blood vessel</td></tr> <tr> <td>fibrin/o</td><td>fibers</td><td>vas/o</td><td>vessel</td></tr> <tr> <td>isch/o</td><td>to hold back</td><td>ven/o</td><td>vein</td></tr> <tr> <td>myocard/i/o</td><td>heart muscle</td><td>ventricul/o</td><td>ventricle</td></tr> <tr> <td>phleb/o</td><td>vein</td><td>venul/o</td><td>venule</td></tr> </table> <p>Suffixes</p> <table> <tr> <td>-cardia</td><td>heart condition</td><td>-spasm</td><td>involuntary muscle contraction</td></tr> <tr> <td>-manometer</td><td>instrument to measure pressure</td><td>-tension</td><td>pressure</td></tr> <tr> <td>-ole</td><td>small</td><td>-tonic</td><td>pertaining to tone</td></tr> <tr> <td>-pressor</td><td>to press down</td><td>-ule</td><td>small</td></tr> </table> <p>Prefixed</p> <table> <tr> <td>di-</td><td>two</td> </tr> </table>	blood vessels	heart	• arteries		• capillaries		• veins		angi/o	vessel	sept/o	wall	aort/o	aorta	son/o	sound	arteri/o	artery	sphygm/o	pulse	arteriol/o	arteriole	steth/o	chest	ather/o	fatty substance	thromb/o	clot	atri/o	atrium	valv/o	valve	cardi/o	heart	valvul/o	valve	coron/o	heart	varic/o	dilated vein	embol/o	plug	vascul/o	blood vessel	fibrin/o	fibers	vas/o	vessel	isch/o	to hold back	ven/o	vein	myocard/i/o	heart muscle	ventricul/o	ventricle	phleb/o	vein	venul/o	venule	-cardia	heart condition	-spasm	involuntary muscle contraction	-manometer	instrument to measure pressure	-tension	pressure	-ole	small	-tonic	pertaining to tone	-pressor	to press down	-ule	small	di-	two	<p>heart, p. 149 Pumps blood through blood vessels</p> <p>artery, p. 155 Carries blood away from the heart</p> <p>vein, p. 156 Carries blood toward the heart</p> <p>capillary, p. 156 Exchange site between blood and tissues</p>
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Anatomy & Physiology

Prior to being introduced to terms associated with an organ system, the anatomy and physiology of that body system is described in concise and easy to understand language. Information coverage begins with the overall function and the organs that comprise the system. Then each organ is addressed with its structure and how it contributes to the function of that system. Having a grasp of this basic level of information before being introduced to terms associated with each system makes it easier for students to understand the pathologic, diagnostic, and therapeutic terms.

Key Terms

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

EXPANDED! Pronunciations

Every chapter includes sound-it-out pronunciations to help students say medical terms accurately.

Color-Coded Word Parts

Red combining forms, blue suffixes, and gold prefixes allow for quick recognition throughout the book.

Informative and Interesting Sidebars

- The popular **Med Term Tip** feature offers tidbits of noteworthy information about medical terms that engage learners.
- **Word Watch** points out words that have a similar sound or similar spelling, and also alerts students about abbreviations that have more than one meaning.
- **What's In A Name?** reinforces the breakdown of terms into word parts.

230 Chapter 7

Anatomy and Physiology of the Respiratory System

bronchial tubes (BRONG-kee-ah)
carbon dioxide
exhalation (eks-hah-LAY-shun)
external respiration
inhalation (in-hah-LAY-shun)
internal respiration
larynx (LAIR-inks)

lungs
nasal cavity (NAY-zal)
oxygen (OK-sib-jen)
pharynx (FAIR-inks)
trachea (TRAY-kee-ah)
ventilation

The organs of the respiratory system include the **nasal cavity**, **pharynx**, **larynx**, **trachea**, **bronchial tubes**, and **lungs**. These organs function together to perform the mechanical and, for the most part, unconscious mechanism of respiration. The cells of the body require the continuous delivery of oxygen and removal of carbon dioxide. The respiratory system works in conjunction with the cardiovascular system to deliver oxygen to all the cells of the body. The process of respiration must be continuous; interruption for even a few minutes can result in brain damage and/or death.

The process of respiration can be subdivided into three distinct parts: **ventilation**, **external respiration**, and **internal respiration**. Ventilation is the flow of air between the outside environment and the lungs. **Inhalation** is the flow of air into the lungs, and **exhalation** is the flow of air out of the lungs. Inhalation brings fresh **oxygen** (O₂) into the air sacs, while exhalation removes **carbon dioxide** (CO₂) from the body.

External respiration refers to the exchange of oxygen and carbon dioxide that takes place in the lungs. These gases diffuse in opposite directions between the air sacs of the lungs and the bloodstream. Oxygen enters the bloodstream from the air sacs to be delivered throughout the body. Carbon dioxide leaves the bloodstream and enters the air sacs to be exhaled from the body.

Internal respiration is the process of oxygen and carbon dioxide exchange at the cellular level when oxygen leaves the bloodstream and is delivered to the tissues. Oxygen is needed for the body cells' metabolism, all the physical and chemical changes within the body that are necessary for life. The by-product of metabolism is the formation of a waste product, carbon dioxide. The carbon dioxide enters the bloodstream from the tissues and is transported back to the lungs for disposal.

Nasal Cavity

cilia (SIL-ee-ah)
mucus (MYOO-kus)
mucous membrane
nares (NAIR-eez)

nasal septum
palate (PAL-et)
paranasal sinuses (pair-ah-NAY-zal)

The process of ventilation begins with the nasal cavity. Air enters through two external openings in the nose called the **nares**. The nasal cavity is divided down the middle by the **nasal septum**, a cartilaginous plate. The **palate** in the roof of the mouth separates the nasal cavity above from the mouth below. The walls of the nasal cavity and the nasal septum are made up of flexible cartilage covered with **mucous membrane** (see Figure 7-1 ■). In fact, much of the respiratory tract is covered with mucous membrane, which secretes a sticky fluid, **mucus**, to help cleanse the air by trapping dust and bacteria. Since this membrane is also wet, it moisturizes inhaled air as it passes by the surface of the cavity. Very small hairs or **cilia** line the opening to the nose (as well as much of the airways).

What's In A Name?
 Look for these word parts:
 hal/o = to breathe
 ox/i = oxygen
 -al = pertaining to
 di- = two
 ex- = outward
 in- = inward

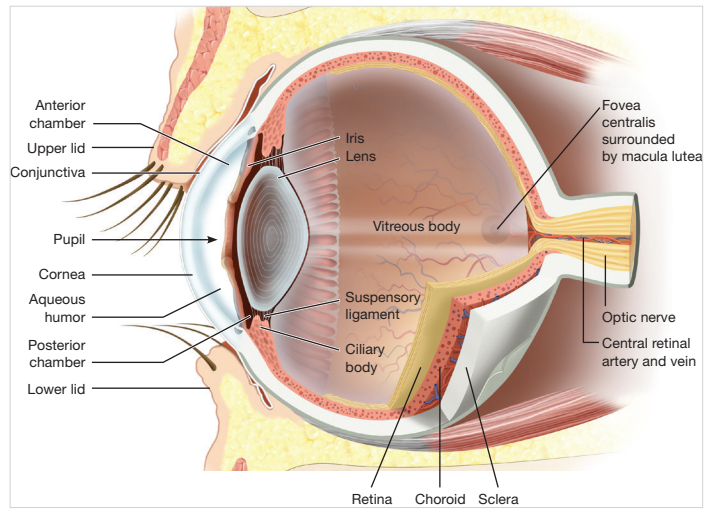
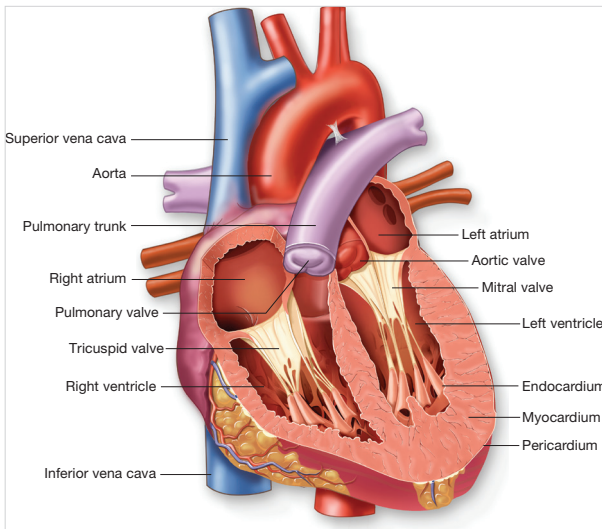
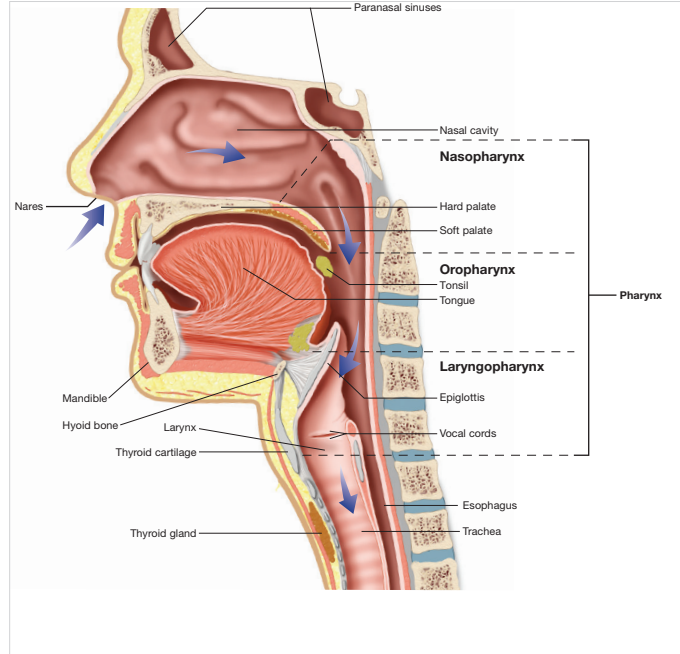
Word Watch
 The terms **inhalation** and **inspiration** (in- = inward + spir/o = breathing) can be used interchangeably. Similarly, the terms **exhalation** and **expiration** (ex- = outward + spir/o = breathing) are interchangeable.

What's In A Name?
 Look for these word parts:
 muc/o = mucus
 -ous = pertaining to

Med Term Tip
 Anyone who has experienced a nosebleed, or epistaxis, is aware of the plentiful supply of blood vessels in the nose.

Medically Accurate Illustrations

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



Terminology Tables

Terms are categorized and presented in a clear, logical, color-coded format that eases the learning process. The major categories include Pathology, Adjective Forms, Diagnostic Procedures, Therapeutic Procedures, Pharmacology, and Abbreviations. Each major category table is further subdivided into smaller subsections of related terms, thereby making learning easier. Also, the three-column format of the tables allows for the term (with pronunciation and/or abbreviation), word parts (if appropriate), and definitions to be displayed. The Pharmacology table also includes drug name examples in a fourth column.

Terminology

Word Parts Used to Build Eye Terms

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

Combining Forms					
aden/o	gland	emmetr/o	correct, proper	opt/o	eye, vision
ambly/o	dull, dim	esthesi/o	sensation, feeling	optic/o	eye, vision
angi/o	vessel	glauco/o	gray	papill/o	optic disk
bi/o	life	ir/o	iris	phac/o	lens
blast/o	immature	irid/o	iris	phot/o	light
blephar/o	eyelid	kerat/o	cornea	pneum/o	air
chromat/o	color	lacrim/o	tears	presby/o	old age
conjunctiv/o	conjunctiva	macul/o	macula lutea	pupill/o	pupil
corne/o	cornea	mi/o	lessening	retin/o	retina
cry/o	cold	myc/o	fungus	scler/o	sclera
cycl/o	ciliary body	mydr/i	widening	stigmat/o	point
cyst/o	sac	nyctal/o	night	ton/o	tone
dacry/o	tears	ocul/o	eye	uve/o	choroid
diplo/o	double	ophthalm/o	eye	xer/o	dry

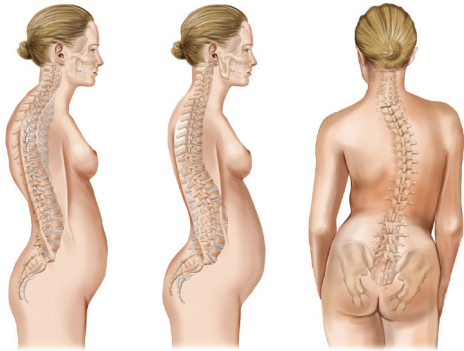
Suffixes					
-al	pertaining to	-logy	study of	-pexy	surgical fixation
-algia	pain	-malacia	abnormal softening	-phobia	fear
-ar	pertaining to	-meter	instrument to measure	-plasty	surgical repair
-ary	pertaining to	-metrist	specialist in measuring	-plegia	paralysis
-atic	pertaining to	-metry	process of measuring	-ptosis	drooping
-ectomy	surgical removal	-oma	tumor; mass	-rrhagia	abnormal flow condition
-edema	swelling	-opia	vision condition	-scope	instrument for viewing
-graphy	process of recording	-opsia	vision condition	-scopy	process of visually examining
-ia	condition	-osis	abnormal condition	-tic	pertaining to
-ic	pertaining to	-otomy	cutting into	-trophy	turned condition
-ician	specialist	-pathy	disease		
-ism	state of				
-itis	inflammation				

Prefixes					
a-	without	exo-	outward	intra-	within
an-	without	extra-	outside of	micro-	small
anti-	against	hemi-	half	mono-	one
de-	without	hyper-	excessive	myo-	to shut
eso-	inward				

Pharmacology			
Vocabulary			
Term	Word Parts	Definition	
cumulative action		Action that occurs in body when drug is allowed to accumulate or stay in body	
prophylaxis (proh-fih-LAK-sis)	pro- = before -phylaxis = protection	Prevention of disease; for example, antibiotic can be used to prevent occurrence of bacterial infection	
Drugs			
Classification	Word Parts	Action	Examples
antibiotic (an-tih-bye-AW-tik)	anti- = against bi/o = life -tic = pertaining to	Kills bacteria causing respiratory infections	ampicillin; amoxicillin, Amoxil; ciprofloxacin, Cipro
	Med Term Tip There are three accepted pronunciations for the prefix anti- , "an-tih," "an-tee," and "an-tye."		
antihistamine (an-tih-HIST-ah-meen)	anti- = against	Blocks effects of histamine released by body during allergy attack	fenofenadine, Allegra; loratadine, Claritin; diphenhydramine, Benadryl
antitussive (an-tih-TUSS-iv)	anti- = without tuss/o = cough	Relieves urge to cough	hydrocodon, Hycodan; dextromethorphan, Vicks Formula 44
bronchodilator (BRONG-koh-dye-lay-ter)	bronch/o = bronchus	Relaxes muscle spasms in bronchial tubes; used to treat asthma	albuterol, Proventil, Ventolin; salmeterol, Serevent
corticosteroids (kor-tih-koh-STAIR-oydz)	cortic/o = outer layer, cortex	Reduces inflammation and swelling in respiratory tract	fluticasone, Fionase; mometasone, Nasonex; triamcinolone, Azmacort
decongestant (dee-kon-JES-tant)	de- = without	Reduces stuffiness and congestion throughout respiratory system	oxymetazoline, Afrin, Dristan, Sinex; pseudoephedrine, Drixoral, Sudafed

Abbreviations			
#	number	ii	two
BCC	basal cell carcinoma	iii	three
bid	two times a day	MM	malignant melanoma
BX, bx	biopsy	oint	ointment
C&S	culture and sensitivity	qid	four times a day
decub	decubitus ulcer	SCC	squamous cell carcinoma
Derm, dermat	dermatology	SG	skin graft
FS	frozen section	SLE	systemic lupus erythematosus
I&D	incision and drainage	STSG	split-thickness skin graft
i	one	Subc, Subq	subcutaneous
ID	intra-dermal	tid	three times a day
		UV	ultraviolet
		x	times

Word Watch
Be careful when using the abbreviation ID meaning intradermal and I&D meaning incision and drainage.

Pathology (continued)		
Term	Word Parts	Definition
		
Figure 4-19 Abnormal spinal curvatures: kyphosis, lordosis, and scoliosis.	Kyphosis (excessive posterior thoracic curvature - hunchback)	Lordosis (excessive anterior lumbar curvature - swayback)
lordosis (lor-DOH-sis)	lord/o = bent backward -osis = abnormal condition	Abnormal increase in forward curvature of lumbar spine; also known as swayback
scoliosis (skoh-lee-OH-sis)	scoli/o = crooked -osis = abnormal condition	Abnormal lateral curvature of spine; see again Figure 4-19 for illustration of abnormal spine curvatures
spina bifida (SPY-nah / BIF-ih-dah)	spin/o = spine bi- = two	Congenital anomaly occurring when vertebra fails to fully form around spinal cord; see also Figure 12-12C
spinal stenosis (steh-NOH-sis)	spin/o = spine -al = pertaining to	Narrowing of spinal canal causing pressure on cord and nerves
	Word Watch Watch how the term stenosis is used in this condition. It most often appears as the suffix -stenosis . However, in this case, it is used as a freestanding word.	
spondylolisthesis (spon-dih-loh-liss-THEE-sis)	spondyl/o = vertebra -listhesis = slipping	Forward sliding of lumbar vertebra over vertebra below it
spondylosis (spon-dih-LOH-sis)	spondyl/o = vertebra -osis = abnormal condition	Specifically refers to ankylosing of spine, but commonly used in reference to any degenerative condition of vertebral column

Therapeutic Procedures

Term	Word Parts	Definition
Medical Procedures		
autologous transfusion (aw-TALL-oh-gus / trans-FYOO-zhun)	auto- = self	Procedure for collecting and storing patient's own blood several weeks prior to actual need; can then be used to replace blood lost during surgical procedure
blood transfusion (trans-FYOO-zhun)	trans- = across fus/o = pouring -ion = action	Artificial transfer of blood into bloodstream
Med Term Tip Before a patient receives a blood transfusion, the laboratory performs a type and cross-match . This test first double-checks the blood type of both the donor's and recipient's blood. Then a cross-match is performed. This process mixes together small samples of both bloods and observes the mixture for adverse reactions.		
bone marrow transplant (BMT)		Patient receives red bone marrow from donor after patient's own bone marrow has been destroyed by radiation or chemotherapy
homologous transfusion (hoh-MALL-oh-gus / trans-FYOO-zhun)	homo- = same	Replacement of blood by transfusion of blood received from another person
packed red cells		Transfusion in which most of plasma, leukocytes, and platelets have been removed, leaving only erythrocytes
plasmapheresis (plaz-mah-fah-REE-sis)	-apheresis = removal, carry away	Method of removing plasma from body without depleting formed elements; whole blood is removed and cells and plasma are separated; cells are returned to patient along with donor plasma transfusion
whole blood		Transfusion of a mixture of both plasma and formed elements

Diagnostic Procedures (continued)

Term	Word Parts	Definition
Pap (Papanicolaou) smear (pap-ah-NIK-oh-lao)		Test for early detection of cancer of the cervix named after developer of test, George Papanicolaou, a Greek physician; a scraping of cells is removed from the cervix for examination under microscope
pregnancy test (PREG-nan-see)		Chemical test that can determine pregnancy during first few weeks; can be performed in physician's office or with home-testing kit
vaginal smear wet mount (VAJ-in-al)	vagin/o = vagina -al = pertaining to	Microscopic examination of cells obtained by swabbing vaginal wall; used to diagnose candidiasis
Diagnostic Imaging		
hysterosalpingography (HSG) (hiss-ter-oh-sai-pin-GOG-rah-fee)	hyster/o = uterus salping/o = uterine tube -graphy = process of recording	Taking of X-ray after injecting radiopaque material into uterus and uterine tubes
mammogram (MAM-oh-gram)	mamm/o = breast -gram = record	X-ray record of the breast
mammography (mam-OG-rah-fee)	mamm/o = breast -graphy = process of recording	X-ray to diagnose breast disease, especially breast cancer
pelvic ultrasonography (PEL-vik / ul-trah-son-OG-rah-fee)	pelv/o = pelvis -ic = pertaining to ultra- = beyond son/o = sound -graphy = process of recording	Use of high-frequency sound waves to produce image or photograph of an organ, such as uterus, ovaries, or fetus

Adjective Forms of Anatomical Terms

Term	Word Parts	Definition
conjunctival (kon-junk-TYE-val)	conjunctiv/o = conjunctiva -al = pertaining to	Pertaining to conjunctiva
corneal (KOR-nee-al)	corne/o = cornea -al = pertaining to	Pertaining to cornea
Word Watch Be careful using the combining forms corne/o meaning <i>pupil</i> and corne/o meaning <i>cornea</i> .		
extraocular (eks-trah-OK-yoo-lar)	extra- = outside of ocul/o = eye -ar = pertaining to	Pertaining to being outside the eyeball; for example, the extraocular eye muscles
intraocular (in-trah-OK-yoo-lar)	intra- = within ocul/o = eye -ar = pertaining to	Pertaining to within eye
iridal (IR-id-al)	irid/o = iris -al = pertaining to	Pertaining to iris
lacrimal (LAK-rim-al)	lacrim/o = tears -al = pertaining to	Pertaining to tears
macular (MAK-yoo-lar)	macul/o = macula lutea -ar = pertaining to	Pertaining to macula lutea
ocular (OK-yoo-lar)	ocul/o = eye -ar = pertaining to	Pertaining to eye
ophthalmic (of-THAL-mik)	ophthalm/o = eye -ic = pertaining to	Pertaining to eye
optic (OP-tik)	opt/o = eye, vision -ic = pertaining to	Pertaining to eye or vision
optical (OP-tih-kal)	optic/o = eye, vision -al = pertaining to	Pertaining to eye or vision
pupillary (PYOO-pih-lair-ee)	pupill/o = pupil -ary = pertaining to	Pertaining to pupil
retinal (RET-ih-nal)	retin/o = retina -al = pertaining to	Pertaining to retina
scleral (SKLair-al)	scler/o = sclera -al = pertaining to	Pertaining to sclera
uveal (YOO-vee-al)	uve/o = choroid -al = pertaining to	Pertaining to choroid layer of eye

UPDATED! Practice As You Go

An assortment of exercises is peppered throughout the chapters to assess students' understanding of the material discussed.

PRACTICE AS YOU GO

D. Terminology Matching

Match each term to its definition.

1. _____ hemolytic disease of the newborn	a. seizures and coma during pregnancy
2. _____ dysmenorrhea	b. erythroblastosis fetalis
3. _____ breech presentation	c. detached placenta
4. _____ abruptio placentae	d. yeast infection
5. _____ eclampsia	e. abnormal discharge from breast
6. _____ pyosalpinx	f. newborn
7. _____ fibroid	g. buttocks first to appear in birth canal
8. _____ candidiasis	h. painful menstruation
9. _____ lactorrhoea	i. pus in the uterine tube
10. _____ neonate	j. benign tumor

PRACTICE AS YOU GO

F. What's the Abbreviation?

1. first pregnancy	_____
2. artificial insemination	_____
3. uterine contractions	_____
4. full-term normal delivery	_____
5. intrauterine device	_____
6. dilation and curettage	_____
7. hormone replacement therapy	_____
8. gynecology	_____
9. abortion	_____
10. oral contraceptive pills	_____

Chapter Review

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

Real-World Applications

Medical Record Analysis
The High-Risk Obstetrics Consultation Report contains 12 medical terms. Underline each term and write it in the list below the report. Then explain each term as you would to a nonmedical person.

High-Risk Obstetrics Consultation Report
Reason for Consultation: High-risk pregnancy with late-term bleeding
History of Present Illness: Patient is 23 years old. She is currently estimated to be at 175 days' gestation. Amniocentesis at 20 weeks shows a normally developing male fetus. She noticed a moderate degree of bleeding this morning but denies any cramping or pelvic pain. She immediately saw her obstetrician who referred her for high-risk evaluation.
Past Medical History: This patient is nulliparous but nullipara with three early miscarriages without obvious cause.
Results of Physical Examination: Patient appears well nourished and abdominal girth appears consistent with length of gestation. Fetal ultrasound indicates placenta previa with bleeding almost completely covering cervix. However, there is no evidence of abruptio placentae at this time. Fetal size estimate is consistent with 25 weeks' gestation. The fetal heart rate is strong with a rate of 150 beats/minute.
Recommendations: Fetus appears to be developing well and in no distress at this time. The placenta appears to be well attached on ultrasound, but the bleeding is cause for concern. With the externally low position of the placenta, this patient is at very high risk for abruptio placentae. She will require Caesarian at onset of labor.

Term	Explanation
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____
6. _____	_____
7. _____	_____
8. _____	_____
9. _____	_____
10. _____	_____
11. _____	_____
12. _____	_____

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.

Chart Note Transcription
The chart note below contains 10 phrases that can be reworded with a medical term presented in this chapter. Each phrase is identified with an underline. Determine the medical term and write your answers in the spaces provided.

Pearson General Hospital Consultation Report
Date: _____ Time: _____ Physician: _____ Specialty: _____ Date: 12 May 2017

Current Complaint: A 64-year-old female with an open sore 1 on her right leg is seen by the specialist in treating diseases of the skin.
Past History: Patient states she first noticed an area of pain, swollen blisters, 3 and redness of the skin 4 just below her right knee about six weeks ago. One week later, fluid-filled blisters, 5 and 6 appeared. Patient states the blisters contain pus and the open sore appeared.
Signs and Symptoms: Patient has a deep open sore 5 x 3 cm. It is 4 cm distal to the knee on the lateral aspect of the right leg. It appears to extend into the deeper skin layer, 8 and the edges show signs of bleeding, 7. The open sore has a small amount of drainage but there is no odor. A growth of the drainage that will grow in the lab to identify the microorganisms and determine the best antibiotic 9 of the drainage revealed Staphylococcus bacteria in the open sore.
Diagnosis: Inflammation of connective tissue in the skin 9
Treatment: Removal of damaged tissue 10 of the open sore followed by application of an antibiotic cream. Patient was instructed to return to the skin disease specialist's office in two weeks, or sooner if the open sore does not heal or if it begins draining pus.

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

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.


Labeling Exercises

Image A
Write the labels for this figure on the numbered lines provided.

Image B
Write the labels for this figure on the numbered lines provided.

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

Case Study
Below is a case study presentation of a patient with a condition discussed in this chapter. Read the case study and answer the questions below. Some questions will ask for information not included within this chapter. Use your text, a medical dictionary, or any other reference material you choose to answer these questions.

 Mary Post, age 60, has come into the physician's office complaining of swelling, stiffness, and arthralgia, especially in her elbows, wrists, and hands. A bone scan revealed acute inflammation in multiple joints with damaged articular cartilage, and an erythrocyte sedimentation rate blood test indicated a significant level of acute inflammation in the body. A diagnosis of acute episode of rheumatoid arthritis was made. The physician ordered nonsteroidal anti-inflammatory medication and physical therapy. The therapist initiated a treatment program of hydrotherapy and therapeutic exercises.

Questions

1. What pathological condition does this patient have? Look this condition up in a reference source and include a short description of it.
2. What type of long-term damage may occur in a patient with rheumatoid arthritis?
3. Describe the other major type of arthritis mentioned in this textbook.
4. What two diagnostic procedures did the physician order? Describe them in your own words. What were the results? (One of the procedures is described in Chapter 6 of this text.)
5. What treatments were ordered? Explain what the physical therapy procedures involve.
6. This patient is experiencing an acute episode. Explain what this phrase means and contrast it with chronic.

3) Case Study
Scenarios that use critical thinking questions to help students develop a firmer understanding of the terminology in context.

Practice Exercises

A. Using Abbreviations
Fill in each blank with the appropriate abbreviation.
1. A(n) _____ specialist is treating conditions of the female reproductive system and a(n) _____ specialist in treating pregnancy issues.
2. _____ always develops symptoms just prior to the menstrual period.
3. _____ is also called thrombolytic therapy.
4. A(n) _____ is performed at an earlier stage of the pregnancy than an amniocentesis.
5. When she stopped taking _____, Natasha had a(n) _____ inserted into her uterus for contraception.
6. Some cases of cervical cancer are caused by a(n) _____ infection.
7. _____ were formerly referred to as VD.
8. The _____ is an important screening tool for prostate cancer.
9. A(n) _____ is performed when the prostate gland is blocking urine flow from the bladder.
10. _____ is associated with the reorganized swirling of a super-saturated soup.

B. Define the Term

1. spermatogenesis
2. hydrocele
3. nonsteroidal resection of the prostate (TURP)
4. sterility
5. orchidectomy
6. vasectomy
7. castration
8. prostate
9. neovagina
10. nulliparous
11. dysuria
12. metastasis
13. fibroid tumor
14. fibrocystic disease
15. placenta previa

C. Word Building Practice
The combining form colp/o refers to the vagina. Use it to write a term that means:
1. visual examination of the vagina _____
2. instrument used to examine the vagina _____
The combining form urethr/o refers to the urethra. Use it to write a term that means:
3. removal of the cervix _____

Practice Exercises—A wide array of updated workbook exercises at the end of each chapter serve as a fun and challenging study review. A larger variety of question types leads to a more engaging assessment of student understanding of concepts like spelling, adjective formation, and anatomy and physiology.

MyLab Medical Terminology™

What is MyLab Medical Terminology?

MyLab Medical Terminology is a comprehensive online program that gives you, the student, the opportunity to test your understanding of information, concepts and medical language to see how well you know the material. From the test results, MyLab Medical Terminology builds a self-paced, personalized study plan unique to your needs. Remediation in the form of etext pages, illustrations, exercises, audio segments, and video clips is provided for those areas in which you may need additional instruction, review, or reinforcement. You can then work through the program until your study plan is complete and you have mastered the content. MyLab Medical Terminology is available as a standalone program or with an embedded etext.

MyLab Medical Terminology is organized to follow the chapters and learning outcomes in *Medical Terminology: A Living Language*. With MyLab Medical Terminology, you can track your own progress through your entire med term course.

How do Students Benefit?

Here's how MyLab Medical Terminology helps you.

- Keep up with information presented in the text and lectures.
- Save time by focusing study and review just the content you need.
- Increase understanding of difficult concepts with study material for different learning styles.
- Remediate in areas in which you need additional review.

Key Features of MyLab Medical Terminology

Pre-Tests and Post-Tests. Using questions aligned to the learning outcomes in *Medical Terminology: A Living Language*, multiple tests measure your understanding of topics.

Personalized Study Material. Based on the topic pre-test results, you receive a personalized study plan, highlighting areas where you may need improvement. It includes these study tools

- Links to specific pages in the etext
- Images for review
- Interactive exercises
- Animations and video clips
- Audio glossary
- Access to full Personalized Study Material

How do Instructors Benefit?

- Save time by providing students with a comprehensive, media-rich study program.
- Track student understanding of course content in the program gradebook.
- Monitor student activity with viewable student assignments.

The screenshot shows a question interface for Chapter 04: Musculoskeletal System. The question asks: "The name for muscle tissue found in the walls of hollow or tube-shaped organs is:". The answer options are: cardiac muscle, myoneural junction, skeletal muscle, smooth muscle, and I DON'T KNOW YET. A "submit" button is visible at the bottom right. The interface includes a Pearson logo, a user name "Bill Johnson", and a progress indicator.

The screenshot shows an interactive exercise titled "Chapter 3: Popping Words" with "Question 1 of 10". The instruction is: "Select the pill container that is a medical match for the text on the pill." There are four pill containers with labels: "necr/o", "scler/o", "mych/o", and "carch/o". A hand is shown holding a pill labeled "Depth". The interface includes a navigation menu on the left and a "Manage View" button on the right.

The screenshot shows the "Course Home" page for "Medical Terminology: A Living Language, 7e". It features a calendar view for the week of 9/12/17 to 11/12/17. The page includes sections for "What to Work on Next" (listing assignments like "Ch 1: Game - Matching"), "Overall Score" (100%), "Submission Progress" (a line graph), and "Recent Achievements" (listing "Earned 100% on Ch 2: MedTerm Speak & Spell"). The interface includes a navigation menu on the left and a "Manage View" button on the right.

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 seventh 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.

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:

- Based on market feedback, we have taken the content that appeared in the special topics chapter in previous editions, and have now broken it up and interspersed this material throughout the book to better correspond with the body systems organization of the text. We hope this change will make incorporating this information easier into your course.
- All of the phonetic pronunciations have been reviewed and revised as needed to ensure consistency and to provide the most commonly used pronunciation.
- The beginning of the Terminology section in each chapter includes an even more comprehensive list of all combining forms, suffixes, and prefixes used to build terms in the remaining sections of the chapter.
- For this seventh edition, every term presented in the book has been evaluated for its currency and additional terms have been added throughout to reflect the newest technologies and procedures.
- **Practice As You Go**, our popular “speed bump” feature scattered throughout the chapters, has been expanded to appear more frequently throughout each chapter to allow 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.
- End-of-Chapter Practice Exercises have been revamped to better emphasize terminology usage rather than simple recall of word parts. In addition to the rewriting of many standard question types, new exercises have been added to the end of each chapter to provide students an engaging opportunity to assess their skills in:
 - spelling
 - building medical terms
 - using abbreviations
 - defining medical terms
 - understanding true-to-life scenarios
 - labeling drawings of human anatomy

Organization of the Book

Introductory Chapters

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 learn about terminology for medical records, the different healthcare settings, and about Pharmacology and the elements of a prescription. 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. Chapter 2 also includes a discussion about the routes used to introduce drugs into the body.

Body Systems 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 phonetic pronunciation guide. Key terms are boldfaced the first time they appear in the narrative for easy recognition. 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 each chapter.

Appendices

The appendices contain helpful reference lists of word parts and definitions provided in the text. This information is intended for quick access and includes three appendices: Word Parts Arranged Alphabetically and Defined, Word Parts Arranged Alphabetically by Definition, and Abbreviations.

Answer Keys

A comprehensive listing of answers is provided in the back of the book for all of the Practice As You Go exercises, as well as the Chapter Review section's Real-World Applications activities, Practice Exercises, and Labeling Exercises. Students should use these answer keys to check their answers as they complete each chapter to better assess any areas that may need additional study.

Glossary/Index

Lastly, all of the key terms in the book appear again in the combination glossary/index at the end of the text. In addition to providing a page reference for each entry, complete definitions of key terms are also presented for quick access.

About the Authors



Bonnie F. Fremgen

Bonnie F. Fremgen, PhD, is a former Associate Dean of the Allied Health Program at Robert Morris College and was vice president of a hospital in suburban Chicago. She was also director of continuing education at three Chicago area hospitals. 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 as well as responsibility for departments of social services, home health care, discharge planning, quality assurance, and hospital-wide education. She currently has two patents on a unique circulation-assisting wheelchair.

Dr. Fremgen holds a nursing degree as well as a master's in healthcare administration. She received her PhD from the College of Education at the University of Illinois. Dr. Fremgen has performed postdoctoral studies in Medical Law at Loyola University Law School in Chicago. She has authored five textbooks with Pearson. Dr. Fremgen has also taught ethics at the University of Notre Dame, South Bend, Indiana; University of Detroit, Detroit, Michigan; and Saint Xavier University, Chicago, Illinois.



Suzanne S. Frucht

Suzanne S. Frucht is an Associate Professor Emeritus of Anatomy and Physiology at Northwest Missouri State University (NWMSU). She holds baccalaureate degrees in biological sciences and physical therapy from Indiana University, an MS in biological sciences at NWMSU, and a PhD in molecular biology and biochemistry from the University of Missouri–Kansas City.

For 14 years Dr. Frucht worked full time as a physical therapist in various healthcare settings, including acute care hospitals, extended care facilities, and home health. Based on her educational and clinical experience she was invited to teach medical terminology part time in 1988 and became a full-time faculty member three years later as she discovered her love for the challenge of teaching. Dr. Frucht has taught a variety of courses including medical terminology, human anatomy, human physiology, and animal anatomy and physiology. She received the Governor's Award for Excellence in Teaching in 2003. After retiring from teaching in 2008, she continues to be active in student learning through teaching medical terminology as an online course and writing medical terminology texts and anatomy and physiology laboratory manuals.

About the Illustrators



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 to 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 120 colleagues from schools across the country who 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.

Reviewers of the Seventh Edition

Pamela A. Dobbins, MS
Shelton State Community
College
Natural Sciences-Biology
Tuscaloosa, Alabama

Gerry Gordon, BA, CPC, CPB
Daytona College
Medical Billing and Coding,
Adjunct Faculty
Ormond Beach, Florida

Timothy J. Jones, BA, MA
Oklahoma City Community
College
Health Professions
Oklahoma City, Oklahoma

Amy Bolinger Snow, MS
Greenville Technical College
Biological Sciences
Department
Greenville, South Carolina

**Pamela J. Edwards, MA,
CCMA, CBCS, NRCMA**
Lone Star College System
Business and Social Sciences
Division
Conroe, Texas

Marleshia D. Hall, PhD
Shelton State Community
College
Department of Natural
Sciences
Tuscaloosa, Alabama

Tammie Petersen RNC-OB, BSN
Austin Community College
Health Sciences
Austin, Texas

Reviewers of Earlier Editions

Yvonne Alles, MBA, RMT
Davenport University
Grand Rapids, Michigan

Pam Besser, PhD
Jefferson Community and
Technical College
Louisville, Kentucky

Barbara Bussard, Instructor
Southwestern Michigan College
Dowagiac, Michigan

**Antoinette Deshaies, RN,
BSPA**
Glendale Community College
Glendale, Arizona

**Rachael C. Alstatter, Program
Director**
Southern Ohio College
Fairfield, Ohio

Norma J. Bird, MEd, BS, CMA
Idaho State University College
of Technology
Pocatello, Idaho

Toni Cade, MBA, RHIA, CCS
University of Louisiana at
Lafayette
Lafayette, Louisiana

Pamela Dobbins, MS, BS, AAS
Shelton State Community
College
Tuscaloosa, Alabama

Steve Arinder, BS, MPH
Meridian Community College
Meridian, Mississippi

Trina Blaschko, RHIT
Chippewa Valley Technical
College
Eau Claire, Wisconsin

Nicole Claussen, MS, CST, FAST
Rolla Technical Institute
Rolla, Missouri

Carole DuBose, LPN, CST
Choffin School of Surgical
Technology
Youngstown, Ohio

K. William Avery, BSMT, JD, PhD
City College
Gainesville, Florida

Richard T. Boan, PhD
Midlands Technical College
Columbia, South Carolina

Gloria H. Coats, RN, MSN
Modesto Junior College
Modesto, California

Carol Eckert, RN, MSN
Southwestern Illinois College
Belleville, Illinois

Beverly A. Baker, DA, CST
Western Iowa Technical
Community College
Sioux City, Iowa

**Susan W. Boggs, RN, BSN,
CNOR**
Piedmont Technical College
Greenwood, South Carolina

Linda A. Costarella, ND
Lake Washington Institute of
Technology
Kirkland, Washington

**Pamela Edwards, MA,
NRCMA**
Lone Star College System
The Woodlands, Texas

Michael Battaglia, MS
Greenville Technical College
Taylors, South Carolina

Bradley S. Bowden, PhD
Alfred University
Alfred, New York

Lyndal M. Curry, MA, RP
University of South Alabama
Mobile, Alabama

Jamie Erskine, PhD, RD
University of Northern Colorado
Greeley, Colorado

**Nancy Ridinger Bean, Health
Assistant Instructor**
Wythe County Vocational School
Wytheville, Virginia

Jeannie Bower, BS, NRCAMA
Central Penn College
Summerdale, Pennsylvania

Nancy Dancs, PT
Waukesha County Technical
College
Pewaukee, Wisconsin

Robert Fanger, MS
Del Mar College
Corpus Christi, Texas

Deborah J. Bedford, CMA, AAS
North Seattle Community
College
Seattle, Washington

Joan Walker Brittingham
Sussex Tech Adult Division
Georgetown, Delaware

**Theresa H. deBeche, RN, MN,
CNS**
Louisiana State University at
Eunice
Eunice, Louisiana

**Mildred K. Fuller, PhD, MT
(ASCP), CLS(NCA)**
Norfolk State University
Norfolk, Virginia

Barbara J Behrens, PTA, MS
Mercer County Community
College
Trenton, New Jersey

**Phyllis J. Broughton,
Curriculum Coordinator**
Pitt Community College
Greenville, North Carolina

Bonnie Deister, MS, BSN, CMA-C
Broome Community College
Binghamton, New York

Deborah Galanski-Maciak
Davenport University
Grand Rapids, Michigan

Debra Getting, Practical Nursing Instructor
Northwest Iowa Community College
Sheldon, Iowa

Ann Queen Giles, MHS, CMA
Western Piedmont Community College
Morganton, North Carolina

Brenda L. Gleason, MSN
Iowa Central Community College
Fort Dodge, Iowa

Steven B. Goldschmidt, DC, CCFC
North Hennepin Community College
Brooklyn Park, Minnesota

Linda S. Gott, RN, MS
Pensacola High School
Pensacola, Florida

Martha Grove, Staff Educator
Mercy Regional Health System
Cincinnati, Ohio

Kathryn Gruber
Globe College
Oakdale, Minnesota

Karen R. Hardney, MSED
Chicago State University
Chicago, Illinois

Mary Hartman, MS, OTR/L
Genesee Community College
Batavia, New York

Joyce B. Harvey, PhD, RHIA
Norfolk State University
Norfolk, Virginia

Beulah A. Hofmann, RN, BSN, MSN, CMA
Ivy Tech Community College of Indiana
Greencastle, Indiana

Kimberley Hontz, RN
Antonelli Medical and Professional Institute
Pottstown, Pennsylvania

Dolly Horton, CMA (AAMA), EdD
Asheville Buncombe Technical Community College
Asheville, North Carolina

Pamela S. Huber, MS, MT (ASCP)
Erie Community College
Williamsville, New York

Eva I. Irwin
Ivy Tech State College
Indianapolis, Indiana

Susan Jackson, EdS
Valdosta Technical College
Valdosta, Georgia

Mark Jaffe, DPM, MHSA
Nova Southeastern University
Ft. Lauderdale, Florida

Carol Lee Jarrell, MLT, AHI
Brown Mackie College
Merrillville, Indiana

Holly Jodon, MPAS, PA-C
Gannon University
Erie, Pennsylvania

Virginia J. Johnson, CMA
Lakeland Academy
Minneapolis, Minnesota

Marcie C. Jones, BS, CMA
Gwinnett Technical Institute
Lawrenceville, Georgia

Robin Jones, RHIA
Meridian Community College
Meridian, Mississippi

Rebecca Keith, PT, MSHS
Arkansas State University
Jonesboro, Arkansas

Gertrude A. Kenny, BSN, RN, CMA
Baker College of Muskegon
Muskegon, Michigan

Dianne K. Kuiti, RN
Duluth Business University
Duluth, Minnesota

Andrew La Marca, EMT-P
Mobile Life Support Services
Middletown, New York

Francesca L. Langlow, BS
Delgado Community College
New Orleans, Louisiana

Julie A. Leu, CPC
Creighton University
Omaha, Nebraska

Norma Longoria, BS, COI
South Texas Community College
McAllen, Texas

Jeanne W. Lovelock, RN, MSN
Piedmont Virginia Community College
Charlottesville, Virginia

Jan Martin, RT(R)
Ogeechee Tech College
Statesboro, Georgia

Leslie M. Mazzola, MA
Cuyahoga Community College
Parma, Ohio

Michelle C. McCranie, CPhT
Ogeechee Technical College
Statesboro, Georgia

Lola McGourty, MSN, RN
Bossier Parish Community College
Bossier City, Louisiana

Patricia Moody, RN
Athens Technical College
Athens, Georgia

Bridgit R. Moore, EdD, MT (ASCP), CPC
McLennan Community College
Waco, Texas

Christine J. Moore, MEd
Armstrong Atlantic State University
Savannah, Georgia

Catherine Moran, PhD
Breyer State University
Birmingham, Alabama

Connie Morgan
Ivy Tech State College
Kokomo, Indiana

Katrina B. Myricks
Holmes Community College
Ridgeland, Mississippi

Pam Ncu, CMA
International Business College
Fort Wayne, Indiana

Judy Ortiz MHS, MS, PA-C
Pacific University
Hillsboro, Oregon

Tina M. Peer, BSN, RN
College of Southern Idaho
Twin Falls, ID

Dave Peruski, RN, MSA, MSN
Delta College
University Center, Michigan

Lisa J. Pierce, MSA, RRT
Augusta Technical College
Augusta, Georgia

Sister Marguerite Polcyn, OSF, PhD
Lourdes College
Sylvania, Ohio

Vicki Prater, CMA, RMA, RAHA
Concorde Career Institute
San Bernardino, California

Carolyn Ragsdale CST, BS
Parkland College
Champaign, Illinois

LuAnn Reicks, RNC, BS, MSN
Iowa Central Community College
Fort Dodge, Iowa

Linda Reigel
Glennville State College
Glennville, West Virginia

Shiela Rojas, MBA
Santa Barbara Business College
Santa Barbara, California

Ellen Rosen, RN, MN
Glendale Community College
Glendale, California

Georgette Rosenfeld, PhD, RRT, RN
Indian River State College
Fort Pierce, Florida

Brian L. Rutledge, MHSA
Hinds Community College
Jackson, Mississippi

Sue Shibley, MEd, CMT, CCS-P, CPC
North Idaho College
Coeur d'Alene, Idaho

Misty Shuler, RHIA
Asheville Buncombe Technical Community College
Asheville, North Carolina

Patricia A. Slachta, PhD, RN, ACNS-BC, CWOCN
Technical College of the Lowcountry
Beaufort, South Carolina

Donna J. Slovinsky, PhD, RHIA, FAHIMA
University of Alabama at Birmingham
Birmingham, Alabama

Connie Smith, RPh
University of Louisiana at Monroe School of Pharmacy
Monroe, Louisiana

Karen Snipe, CPhT, ASBA, MAEd
Trident Technical College
Charleston, South Carolina

Janet Stehling, RHIA
McLennan College
Lorena, Texas

Karen Stenback, MFA, CHHC
Antelope Valley College
Lancaster, California

Donna Stern
University of California San Diego
La Jolla, California

Jodi Taylor, AAS, LPN, RMA
Terra State Community College
Fremont, Ohio

**Annmary Thomas, MEd,
NREMT-P**
Community College of
Philadelphia
Philadelphia, Pennsylvania

Lenette Thompson, CST, AS
Piedmont Technical College
Greenwood, South Carolina

Scott Throneberry, BS, NREMT-P
Calhoun Community College
Decatur, Alabama

Maureen Tubbiola, MS, PhD
St. Cloud State University
St. Cloud, Minnesota

Marilyn Turner, RN, CMA
Ogeechee Technical College
Statesboro, Georgia

**Marianne Van Deursen, MS,
Ed, CMA (AAMA), MLT**
Warren County Community
College
Washington, New Jersey

Joan Ann Verderame, RN, MA
Bergen Community College
Paramus, New Jersey

Twila Wallace, MEd
Central Community College
Columbus, Nebraska

Kathy Wallington
Phillips Junior College
Campbell, California

Linda Walter, RN, MSN
Northwestern Michigan
College
Traverse City, Michigan

Jean Watson, PhD
Clark College
Vancouver, Washington

Twila Weiszbrod, MPA
College of the Sequoias
Visalia, California

Sara J. Wellman, RHIT
Indiana University Northwest
Gary, Indiana

Leesa Whicker, BA, CMA
Central Piedmont Community
College
Charlotte, NC

**Lynn C. Wimett, RN, ANP,
EdD**
Regis University
Denver, Colorado

Kathy Zaiken, PharmD
Massachusetts College of
Pharmacy and Health Sciences
Boston, Massachusetts

**Judith Zappala, MT, ASCP,
MBA**
Middlesex Community College
Lowell, Massachusetts

**Carole A. Zeglin, MEd, BS,
MT, RMA (AMT)**
Westmoreland County
Community College
Youngwood, Pennsylvania

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 many of the pieces of art that grace 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. Any corrections can be sent to us through your institution's Pearson representative or please mail them to:

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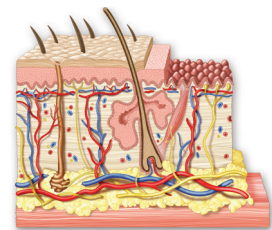
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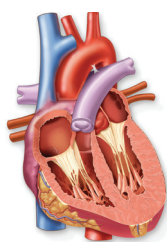
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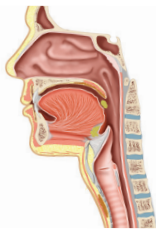
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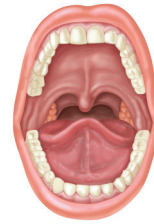
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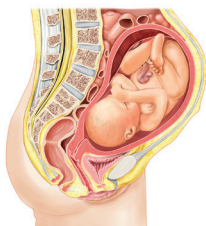
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