



Medical Language

IMMERSE YOURSELF

THIRD EDITION

Susan M. Turley

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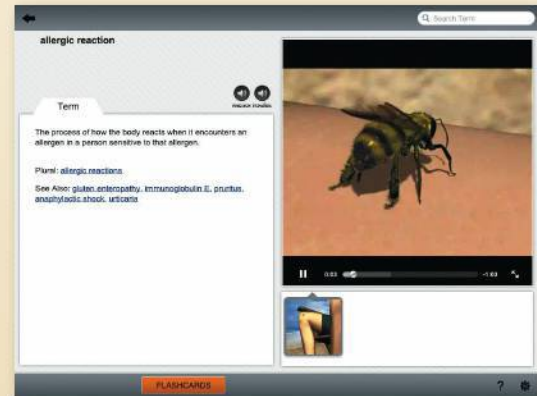
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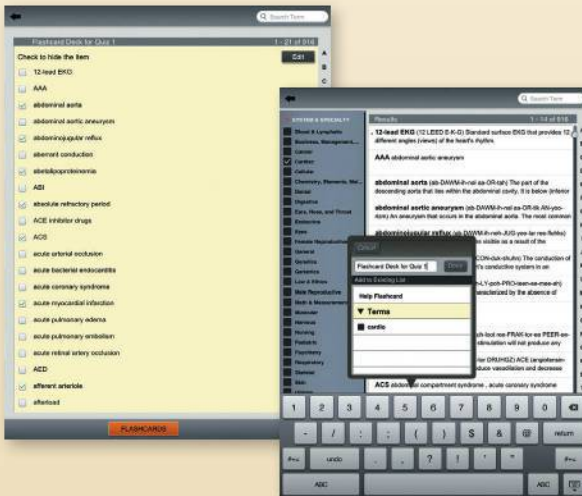
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DEDICATION

To my husband Al
for his support and love

To our children,
Daniel, Minh, and Lien

Two Journeys

In August 2000, I began two journeys—the adoption of children into our family and the writing of this textbook. Although very different, these two journeys shared a common thread of language and communication.

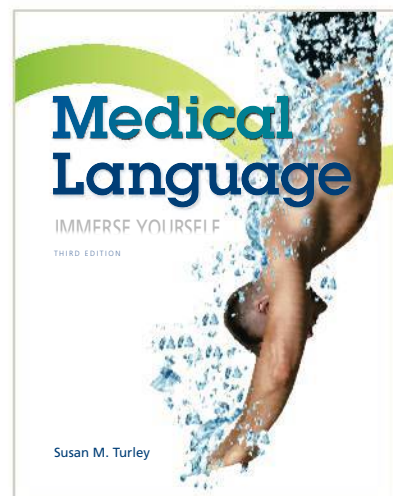
The first journey was the adoption of two beautiful children, Minh and Lien (ages 8 and 9), who joined our family from an orphanage in Vietnam in 2001. This journey of adoption involved completing much paperwork and research, learning a new language and culture, and traveling to an exotic land.

For many months prior to the adoption, nearly everything I did on a day-to-day basis was, in some way, affected by the decision to adopt. I purchased Vietnamese language study aids and began to spend an hour each day studying. A Vietnamese-American friend tutored me, teaching me Vietnamese phrases and laughing with me when I unknowingly said something I didn't intend to say. My studies were rewarded, however, when I was able to communicate with my new daughters, even as they quickly learned to speak English.

The second journey was the process of writing this textbook. This journey also involved paperwork and research, but I did not need to learn a new language or culture. Because of my many years of experience in the healthcare field, I already understood medical language and culture.

I did, however, need to determine the best way to convey that knowledge to each student who studies this textbook. And so, as I wrote, I drew on my own efforts and struggles to learn a new language during the adoption process. Those insights helped me identify with students who are learning medical language for the first time and enabled me to include textbook features that would support and strengthen students' efforts as they learned.

As I write this page in late 2012, I am ever-mindful of the many children in need of help, food, and homes.



Did You Know?



The royalties from this textbook are given to provide ongoing financial support to orphanages and feed-and-read school programs for destitute children in several countries.

Dive Into Something Different

No new medical terminology book has touched the lives of so many people as profoundly as *Medical Language*. We credit the astounding success of the award-winning first edition to its special ability to meet the needs of students and instructors. This new edition builds on our commitment to excellence, and so we have once again challenged our development team (see page xvii) to critique every feature, every page, every word—all to help enhance the learning and teaching process. The result has been an integration of features that “you,” our customer, have asked for and will not find in other books.

CHAPTER FORMAT

Each medical specialty chapter follows a consistent organization designed for student success.

1 Visual Introduction—Engages students with a stimulating collection of fun facts and images that help “launch” the chapter.

Dive In!

- Blood circulates through the human body in about 20 seconds, traveling thousands of miles per day.
- 15 million blood cells are produced and destroyed in the body every second.
- To score an A or B for AB or O+, long reading. In this chapter, we'll explore the language that describes blood and transfusion, system structures, functions, and diseases.
- Your knowledge will be flexing once you master the language of hematology and immunology!

▲ An acrophil is a type of white blood cell, as part of the immune response, it destroys foreign cells and parasites.

▶ Blood contains proteins that female mosquitoes need to lay their eggs. That's why only the female bite. The person's blood is visible in the mosquito's abdomen.

6

Hematology and Immunology

Blood and Lymphatic System

Hematology (he-mah-TAW-loh-jee) is the medical specialty that studies the anatomy and physiology of the blood and uses diagnostic tests, medical and surgical procedures, and drugs to treat blood diseases.

Immunology (in-myoo-NAW-loh-jee) is the medical specialty related to the lymphatic system and the immune response.

▲ The lymphatic system consists of vessels and nodes that defend the body by the immune response.

▶ Blood is an essential transport system containing red and white blood cells.

1859 Louis Pasteur suggests that microorganisms cause disease.	1862 Swiss physician Hermann Spallanzani invents the first germ-free medium.	1863 The International Red Cross is founded.	1865 Johnston Gregg Mendel formulates the laws for genetics while crossbreeding pea plants.

Measure Your Progress: Learning Objectives

- Identify the structures of the respiratory system.
- Describe the process of respiration.
- Describe common respiratory diseases, laboratory and diagnostic procedures, medical and surgical procedures, and drug categories.
- Give the medical meaning of word parts and abbreviations related to the respiratory system.
- Build respiratory words from word parts and divide and define respiratory words.
- Analyze the medical content and meaning of a pulmonology report.
- Dive deeper into pulmonology by reviewing the activities at the end of this chapter and online at www.MyMedicalTerminologyLab.com.



Anatomy and Physiology

The **respiratory system** consists of the right and left lungs and the air passageways that connect the lungs to the outside of the body. The upper respiratory system in the head and neck includes the nose, nasal cavity (see Figure 4-1a), and pharynx (throat). The lower respiratory system shares these structures with the ears, nose, and throat system (discussed in “Otolaryngology,” Chapter 5B). The lower respiratory system includes the larynx (voice box) and trachea (windpipe) in the neck and the bronchi, bronchioles, and alveoli in the lungs. The lungs fill much of the thoracic cavity. The purpose of the respiratory system is to bring oxygen into the body and expel the waste product carbon dioxide.

Word Alert

The respiratory system is also known as the **respiratory tract**. A tract is a pathway. The adjective **cardiopulmonary** reflects the connection between the heart and the respiratory system. Without the heart, oxygen brought into the lungs would never reach the rest of the body, and carbon dioxide produced by the cells in the body would never reach the lungs to be exhaled.

Anatomy of the Respiratory System

Nose and Nasal Cavity

The nose contains the **nasal cavity**, which is divided in the center by the **nasal septum**. On each side of the cavity are three long, bony projections: the superior, middle, and inferior **turbinates** or **nasal conchae** (see Figure 4-2a). These jet into the nasal cavity and slow down inhaled air so that it can be warmed and moistened. The nasal cavity is lined with **mucosa**, a **mucous membrane** that humidifies the air and produces **mucus**. Mucus and hairs in the nose trap inhaled particles of dust, pollen, smoke, and bacteria and keep them from entering the lungs. The sinuses in the bones

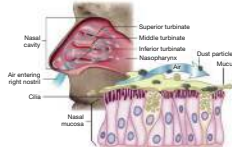


Figure 4-2 | Nasal cavity. An opening in the nasal cavity leads around the turbinates, allowing the mucus to warm and moisten it before it goes to the lungs. This helps the body maintain its core temperature and keeps the tissues of the lungs free from being dehydrated. The mucus also produces mucus to trap inhaled particles and bacteria before they enter the lungs.

Word Building
respiratory (re-spi-rah-TOR-ee) (re- + spi- + rah- + TOR-ee)
re- again and again; backward
-spir- breathe, a coil
-atory pertaining to
Select the correct prefix meaning to give the definition of respiratory: pertaining to again and again (re-).
nasal (NAH-sal)
nas- nose
-al pertaining to
Nasal is the adjective form for nose.

cardiopulmonary (kar-deo-pul-mo-NAH-ree) (kar- + deo- + pul- + mo- + NAH-ree)
cardio- heart
pulmo- lung
-ary pertaining to

septum (SEP-um)
septal (SEP-ah)
sept- septum (dividing wall)
-al pertaining to
turbinates (TUR-bin-ay-ee)
turbin- coil of structure
-ate composed of, pertaining to
concha (CON-ah)
conch- shell (by changing -h to -ae)
mucosa (moo-KOH-sah)
mucos- mucous membrane
-al pertaining to
mucous (MYOO-koo)
mucos- mucus
-ary pertaining to

Medical Language Key

To unlock the definition of a medical word, break it into word parts. Give the meaning of each word part. Put the word part meanings in order, beginning with the suffix, then the prefix (if present), then the combining form(s).

pulmon/o-	-logy
pulmo- mucus lung	-logy means the study of
Suffix: Combining Form	Word Part Meaning -ology the study of
Pulmonology: The study of the lungs (and related structures).	

Figure 4-1 | Respiratory system. The respiratory system consists of the main organs—the large—and related structures connected to the lungs. These form a pathway through which air flows into and out of the body.

2 Objectives/Medical Language Key—Focus students on the goals of each chapter and provides a word analysis of the chapter title.

3 Anatomy and Physiology—Presents fundamental information about relevant body systems—reflecting the level of detail that the vast majority of instructors told us they need.

Vocabulary Review

Anatomy and Physiology

Word or Phrase	Description	Combining Forms
cardiopulmonary	Pertaining to the heart and lungs	cardi/o- heart pulmon/o- lung
cardiothoracic	Pertaining to the heart and thoracic cavity	cardi/o- heart thorac/o- thorax (chest)
cardiovascular system	Body system that includes the heart and the blood vessels (vascular structures)	cardi/o- heart vascul/o- blood vessel
circulatory system	Circular route that the blood takes as it moves through the body. Circulation is the process of moving the blood through the system. The circulatory system consists of the systemic circulation and the pulmonary circulation.	circulat/o- movement in a circular route
mediastinum	Irregularly shaped, central area in the thoracic cavity that lies between the lungs. It contains the heart, great vessels, thymus, trachea, and esophagus.	mediastin/o- mediastinum thorac/o- thorax (chest)
pulmonary circulation	The arteries, arterioles, capillaries, venules, and veins going to, within, and coming from the lungs	pulmon/o- lung
systemic circulation	The arteries, arterioles, capillaries, venules, and veins everywhere in the body, except in the lungs	system/o- the body as a whole

4 Vocabulary Review—Reinforces understanding with an at-a-glance review of each key term, a description, and an analysis of its word parts. A self-study quiz section follows with a heavy emphasis on word construction.

Diseases

Note: Most diseases of the nose, larynx, and pharynx are discussed in "Otolaryngology," Chapter 16.

Nose and Pharynx

Word or Phrase	Description	Word Building
upper respiratory infection (URI)	Bacterial or viral infection of the nose and/or throat. It is also known as the common cold or a head cold (see Figure 4-8B). Treatment: Antibiotic drug for a bacterial infection.	infect/o- (in-EE-ctuh) disease within -ion action, condition



Figure 4-8 ■ Upper respiratory infection.
The common cold is an upper respiratory infection caused by a bacterium or virus. It spreads easily to others on unwashed hands or by droplets of mucus and saliva that are expelled into the air during sneezing and coughing.

5 Terms Related to Diseases and Procedures—Provide word analysis, descriptions, rich visuals, and fun facts about diseases and diagnostic and medical procedures.

Drug Categories

These categories of drugs are used to treat respiratory diseases. The most common generic and trade name drugs in each category are listed.

Category	Indication	Examples	Word Building
antibiotic drugs	Treat respiratory infections caused by bacteria. Antibiotic drugs are not effective against viral respiratory infections.	amoxicillin (Amoxicillin), amoxicillin (generic), ciprofloxacin (Cipro), clarithromycin (Biaxin)	antibiotic- (an-tee-ee-oh-see-by-oh-see) (an-tee-ee-oh-see) drug against infection
antitubercular drugs	Treat tuberculosis. Several of these drugs must be used together in combination to be effective.	isoniazid (INH), rifampin (Rifampin), ethambutol (Myambutol), pyrazinamide (PZA)	antitubercular- (an-tee-tee-see-see-see) (an-tee-tee-see-see) drug against tuberculosis
antitussive drugs	Suppress the cough center in the brain. They are used to treat chronic bronchitis and nonproductive coughs. Some of these contain a narcotic drug.	dextromethorphan (Robitussin), hydrocodone (Hydrocodone)	antitussive- (an-tee-tee-see-see) (an-tee-tee-see-see) drug against cough
antiviral drugs	Prevent and treat influenza virus infection in at-risk patients with asthma or lung disease.	oseltamivir (Tamiflu)	antiviral- (an-tee-vee-ee-see) (an-tee-vee-ee-see) drug against virus
bronchodilator drugs	Dilate constricted airways by relaxing the smooth muscles that surround the bronchioles. They are used to treat asthma, COPD, emphysema, and cystic fibrosis. They are given orally or inhaled through a metered-dose inhaler (MDI) (see Figure 4-24B).	albuterol (Proventil), salmeterol (Serevent), theophylline (Elophyllin)	bronchodilator- (brong-oh-dill-ee-oh) (brong-oh-dill-ee-oh) drug that produces or opens, dilates, or produces




Figure 4-24 ■ Metered-dose inhaler.
A metered-dose inhaler (MDI) automatically delivers a premeasured dose of a bronchodilator drug or corticosteroid drug into the lungs as the patient inhales through the mouth. The dose is premeasured as the number of metered sprays or puffs.

6 Drug Categories—Describe the most common generic and trade name drugs used to treat the diseases presented.

Abbreviations

ABG	arterial blood gases	MDI	metered-dose inhaler
ABF	acid fast bacillus	O₂	oxygen
ABP	auscultation and percussion	PA	posterior/anterior (view on chest x-ray)
AP	anteroposterior (view on chest x-ray)	PCO₂	partial pressure of carbon dioxide (also pCO ₂)
ARDS	acute respiratory distress syndrome; adult respiratory distress syndrome	PCP*	Pneumocystis carinii pneumonia
BS	breath sounds	PFT	pulmonary function test
C&S	culture and sensitivity	PND	paroxysmal nocturnal dyspnea
CF	cystic fibrosis	PO₂	partial pressure of oxygen (also pO ₂)
CO	carbon monoxide	PPD	packs per day (of cigarettes)
CO₂	carbon dioxide	PFT	purified protein derivative (TB test)
COPD	chronic obstructive pulmonary disease	RA	room air (no supplemental oxygen)
CNAP	continuous positive airway pressure ("SEE-pap")	RDS	respiratory distress syndrome
CR	cardiopulmonary resuscitation	RL	right lower lobe (of the lung)
CXR	chest x-ray	RM	registered respiratory therapist
DOE	dyspnea on exertion	RRT	registered respiratory therapist
ENT	ear, nose, and throat	RUL	right upper lobe (of the lung)
ET	endotracheal tube	SARS	severe acute respiratory syndrome
FEV₁	forced expiratory volume (in one second)	SIDS	sudden infant death syndrome
FiO₂	fraction (percentage) of inspired oxygen	SOB**	shortness of breath
FVC	forced vital capacity	TB	tuberculosis
HMO	health maintenance organization	TR	temperature, pulse, and respiration
LLL	left lower lobe (of the lung)	URI	upper respiratory infection
LUL	left upper lobe (of the lung)	V/Q	ventilation-perfusion (scan)

*This abbreviation is still used, but it is incorrect, as the name of this organism is now *Pneumocystis jirovecii*.
**This abbreviation is still in use, but many hospitals have removed it from their official list of abbreviations because it also has an undesirable meaning that is unrelated to the respiratory system.

Word Alert

ABBREVIATIONS
Abbreviations are commonly used in all types of medical documents; however, they can mean different things to different people and their meanings can be misinterpreted. Always verify the meaning of an abbreviation.

ABP means auscultation and percussion, but it also means anatomy and physiology.
BS means breath sounds, but it also means bowel sounds.
C&S means culture and sensitivity, but it can be confused with the sound-like abbreviation CNS (central nervous system).
PND means paroxysmal nocturnal dyspnea, but it also means postnasal drip.
PPD means purified protein derivative (TB test), but it also means packs per day (of cigarettes smoked).
RA means room air, but it also means rheumatoid arthritis or right atrium (of the heart).

7 Abbreviations—Provide a quick-reference listing of the most common abbreviations related to each medical specialty.



8 Career Focus—Orients students to a different career in each chapter. A full-length, in-depth career video of a real person is online at www.MyMedicalTerminologyLab.com.

Chapter Review Exercises

Test your knowledge of the chapter by completing these review exercises. Use the Answer Key at the end of the book to check your answers.

Anatomy and Physiology

Matching Exercise

Match each word or phrase to its description.

1. axon	_____	Hormone from the adrenal gland that acts with the sympathetic division of the nervous system
2. cauda equina	_____	Four hollow chambers within the brain that contain CSF
3. corpus callosum	_____	Between the pons and the spinal cord
4. cranial nerves	_____	Cells that make myelin around the larger axons of cranial nerves and spinal nerves
5. cranium	_____	Involuntary muscle reaction controlled by the spinal cord
6. dermatome	_____	There are 12 pairs of them
7. epinephrine	_____	Nerve roots that come out of the inferior end of the spinal cord
8. gustatory cortex	_____	Part of the neuron that may be myelinated
9. medulla oblongata	_____	Space between the axon of one neuron and the dendrite of the next neuron
10. neurotransmitter	_____	Area in the meninges that contains cerebrospinal fluid

9 Chapter Review Exercises—Fortify student understanding with a fun and extensive variety of exercises designed for a range of learning styles.

MyMedicalTerminologyLab™

Now that you have finished reading this chapter, make sure you log on to www.MyMedicalTerminologyLab.com to measure your understanding and progress.

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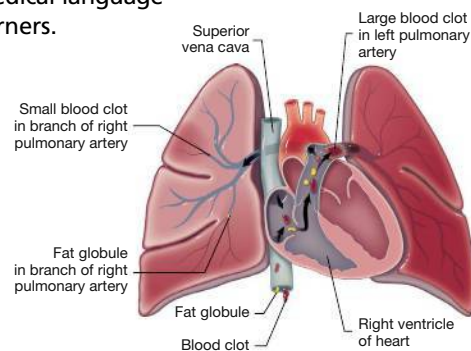
10 MyMedicalTerminologyLab Preview— Provides a visual snapshot of the wealth of study opportunities students can find on www.MyMedicalTerminologyLab.com.



SPECIAL FEATURES

“How would you describe the ideal medical terminology textbook?” That is the question we asked our development team of students and instructors. Their responses helped us craft an array of special features that make this book unique.

Vibrant Illustrations and Photographs—Bring medical language to life and stimulate understanding, especially for visual learners.



Description	Word Building
Blockage of a pulmonary artery or one of its branches by an embolus (see Figure 4-15 ■). A patient on prolonged bedrest or one with an injury to the leg can develop a blood clot in the leg (deep vein thrombosis), or a fractured bone can release a fat globule. The embolus (blood clot or fat globule) travels in the circulatory system to a pulmonary artery where it is trapped and blocks the blood flow. There is decreased oxygenation of the blood and dyspnea. A large pulmonary embolus can be fatal. Treatment: Oxygen therapy, thrombolytic drug (to dissolve a blood clot).	embolism (EM-boh-lizm) embol/o- embolus (occluding plug) -ism process; disease from a specific cause embolus (EM-boh-lus)

Word Building—A section in the margins and within various tables throughout, this appears whenever a new word is introduced. It gives students the tools to understand unfamiliar words on their own—reinforcing that word building is an ongoing process.

Special Boxes—Spark student interest with key details relating the material to the real world of medicine.

Across the Life Span

Pediatrics. Childhood immunizations against measles, mumps, rubella, polio, diphtheria, pertussis, and tetanus use a vaccine made of dead or weakened pathogens or inactivated endotoxins. The vaccination causes B lymphocytes to become plasma cells and produce antibodies, and this gives active immunity without exposure to the actual disease. The meningococcal meningitis vaccine is recommended for college students living in dormitories.

Adult immunizations include annual vaccinations for influenza (the flu) and periodic boosters for tetanus.

A Closer Look

There are five classes of **antibodies** or **immunoglobulins**: immunoglobulin A (IgA), immunoglobulin D (IgD), immunoglobulin E (IgE), immunoglobulin G (IgG), and immunoglobulin M (IgM).

Class Description
 IgA IgA is in body secretions (tears; saliva; mucus in the nose, lungs, and intestines) and on the surface of the skin. IgA is in colostrum, the first milk produced by a breastfeeding mother; this maternal IgA provides **passive immunity** until 18 months of age when the infant begins to make its own antibodies.

immunity (ih-MYOO-nih-tee)
immun/o- immune response
-ity state; condition

Across the Life Span—Brings an infusion of relevant information related to pediatrics and geriatrics.

A Closer Look—Presents a quick, focused glance at a pertinent detail related to material being covered.

Clinical Connections

Hematology (Chapter 6). The stomach plays an indirect role in the production of red blood cells. It secretes intrinsic factor that allows vitamin B₁₂ (a building block of red blood cells) to be absorbed from the intestine into the blood. When the stomach does not produce enough intrinsic factor or when part of the stomach is removed (gastrectomy) because of a cancerous tumor, vitamin B₁₂ is not absorbed; the red blood cells that are formed are very large, fragile, and die prematurely. This disease is called pernicious anemia.

Dietetics. Individuals whose small intestine does not produce enough of the digestive enzyme lactase experience gas and bloating when they drink milk or eat dairy products. This is caused by undigested lactose (the sugar in milk).

Word Alert

SOUND-ALIKE WORDS

albumen (noun) the white of an egg
Example: Albumen in egg whites is a good source of dietary protein.

albumin (noun) protein molecule in the blood
Example: Albumin is an important protein in the plasma.

Did You Know?

The Austrian pathologist Dr. Karl Landsteiner discovered the first two antigens on an erythrocyte in 1900. He named them A and B and categorized blood into the four blood types: A, B, AB, and O. He won a Nobel Prize for this in 1930. Landsteiner and other scientists discovered the Rh blood group in the blood of a rhesus monkey in 1940.

Clinical Connections—Highlights examples of the relationships and synergies between medical specialties.

Word Alert—Presents important notes about the nuances, meanings, variations, and peculiarities of selected words.

Did You Know?—Showcases fun, interesting information designed to stimulate student curiosity.

It's Greek to Me!—Gives useful reminders about how Greek and Latin combining forms remain part of medical language today.

It's Greek to Me!

Did you notice that some words have two different combining forms? Combining forms from both Greek and Latin remain a part of medical language today.

Word	Greek	Latin	Medical Word Examples
abdomen	celi/o- lapar/o-	abdomin/o- ventr/o-	celiac trunk, celiac disease, abdominal laparoscopy, laparotomy, ventral
bile, gall, or bile duct	cholangi/o- cholechoch/o-	billi/o-	cholangitis, cholangiography, biliary choledocholithiasis, choledocholithotomy
digest	peps/o- pept/o-	digest/o-	pepsin, pepsinogen, digestive, digestion peptic
fat	steat/o-	lip/o-	steatorrhea, lipase
intestine	enter/o-	intestin/o-	enteropathy, gastroenteritis, gastroenterologist, gastroenterology,

Technology in Medicine

In the past, physician–patient contact was always face to face. Now, telecommunication advances allow patients to receive care via telemedicine—also known as televisiting—through life-sized videoconferencing screens, remote monitoring of vital signs, etc. Physicians use videoconferencing to consult with specialists (eConsulting). Surgeons in one part of the world do telesurgery with on-site and remote robots and 3-D visualization to operate on a patient thousands of miles away.

Technology in Medicine—Presents snapshots of the ways technology is changing health care.

MyMedicalTerminologyLab™

www.MyMedicalTerminologyLab.com

What is MyMedicalTerminologyLab?

MyMedicalTerminologyLab is a comprehensive online program that gives you the opportunity to test your understanding of information, concepts and medical terminology to see how well you know the material. From the test results, MyMedicalTerminologyLab 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. MyMedicalTerminologyLab is available as a standalone program or with an embedded etext.

MyMedicalTerminologyLab is organized to follow the chapters and learning objectives in **Medical Language**, Third Edition. With MyMedicalTerminologyLab, you can track your own progress through your entire med term course.

How do Students Benefit?

Here's how MyMedicalTerminologyLab helps you.

- Keep up with new, complex information presented in the text and lectures.
- Save time by focusing study and review on 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 MyMedicalTerminologyLab

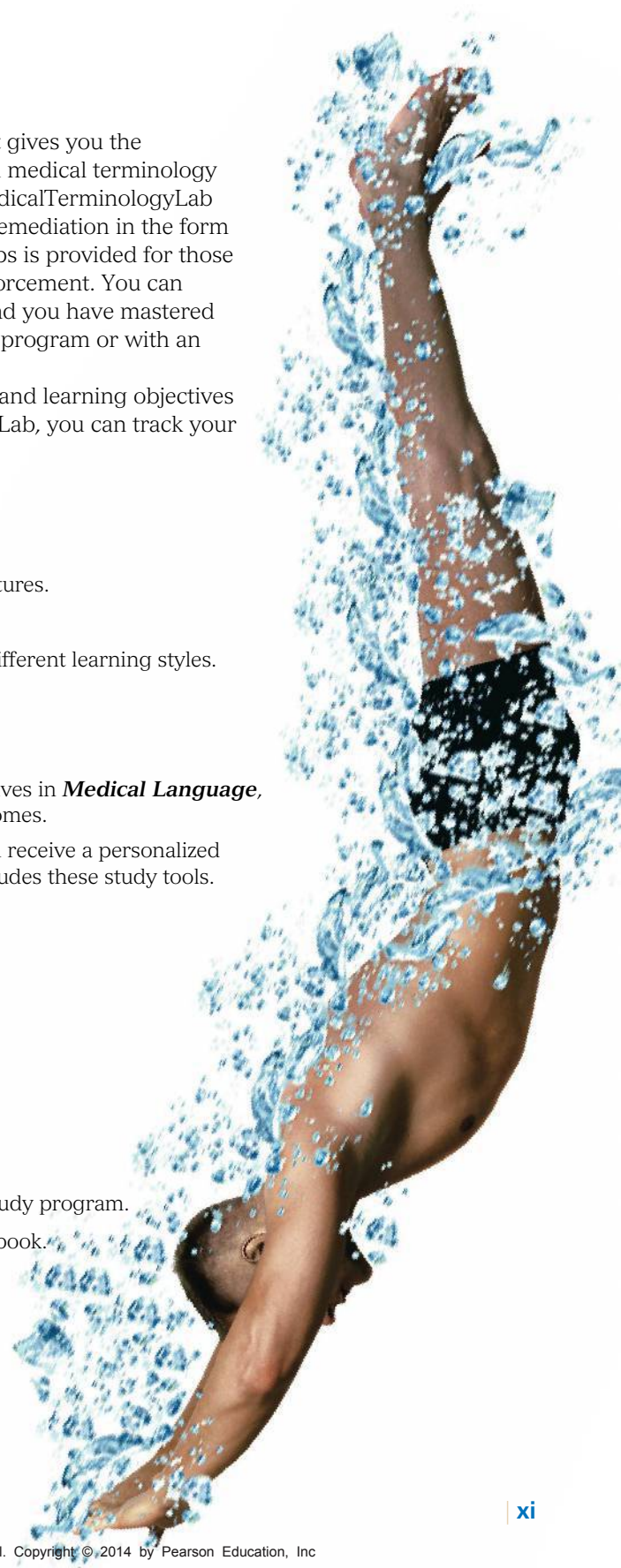
Pre-Tests and Post-Tests. Using questions aligned to the learning objectives in **Medical Language**, tests measure your understanding of topics and expected learning outcomes.

Personalized Study Material. Based on the topic pre-test results, you will 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.





COMPREHENSIVE TEACHING PACKAGE

Perhaps the most gratifying part of an instructor's work is the "aha" learning moment when the light bulb goes off and a student truly understands a concept—when that connection is made. Along these lines, Pearson is pleased to help instructors foster more of these educational connections by providing a complete suite of resources to support teaching and learning. Qualified adopters are eligible to receive a wealth of tools designed to help instructors prepare, present, and assess. For more information, please contact your Pearson sales representative or visit www.pearsonhighered.com/educator.

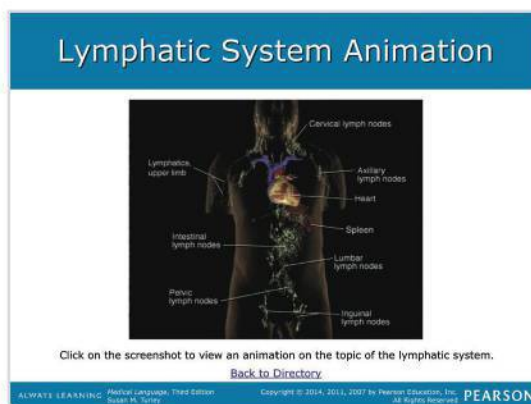
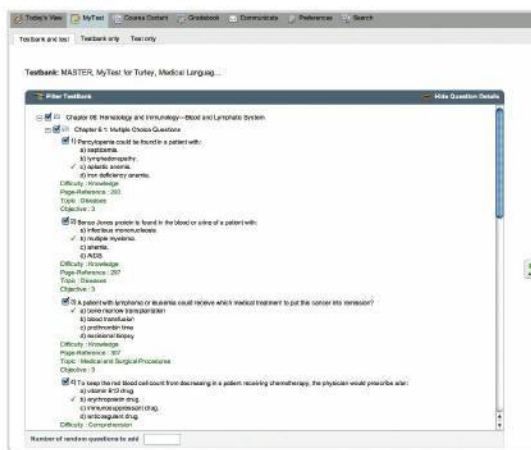
Instructor's Resources

- The complete 4,800-question test bank that also allows instructors to generate customized exams and quizzes.
- A comprehensive, turn-key lecture package with full narrated lecture by the author in PowerPoint format containing discussion points and a powerful library of images, animations, and videos.
- A sample course syllabus.
- PowerPoint content to support instructors who are using Personal Response Systems ("clickers").
- A complete image library that includes every photograph and illustration from the book.
- Articles with useful ideas such as classroom management tips, how to construct test questions, and how to put students at ease on the first day of class.
- Nearly 100 ready-made worksheets that can be used for quizzes or homework assignments.

Annotated Instructor's eText

This is an annotated version of the book that contains every page of the student edition but with margin material to help enrich the instructional experience.

- An array of teaching pearls and tips.
- Interesting facts and anecdotes.
- Extra content, such as word derivations, not covered in the book.
- Answers to each of the student self-study questions in each chapter.



Preface

Something Different

You may have already noticed that there is something different about this book. Perhaps by examining the cover and thumbing through the pages, you have taken note of the abundance of real-world healthcare images. Maybe you have discovered some of the practice exercises that abound within these pages, many of which place you in your soon-to-be-realized role of a healthcare professional. Or perhaps you have already begun exploring the revolutionary student media materials that are rich with highly engaging and interactive activities that add a unique dimension to your learning. As you begin this exciting and important journey into the world of medical language and health care, we offer you a single promise—that you will soon be immersed in a new, exciting learning experience.

As a soon-to-be healthcare professional, your knowledge, hard work, and interpersonal skills will have a direct impact on health care throughout your career. Therefore, we do everything we can to help you learn and to empower you so you can use what you learn to positively impact the lives of others. And so, we encourage you to immerse yourself in this book and the rich variety of resources it offers to help you learn medical language, the language of your chosen career!



The Title of This Book

Let's start at the beginning and take a close look at the title of this book: **Medical Language**.

Medical

Medicine is the drama of life and death, and few subjects are as compelling, profound, or worthy of study. This book is about real medicine that affects real patients—their lives, their families, and their futures. As a healthcare professional, no matter which aspect of health care you choose, you will have important responsibilities. Therefore, we feel it is our responsibility to provide you with as realistic a view as possible of health care today. Here are some examples of how we have done this:

- The majority of the images in this book incorporate medical illustrations and photographs that include a diverse array of real people, instead of cartoon-like illustrations. The photographs are of real patients and real healthcare professionals in real healthcare settings.
- The chapter review exercises present real medical reports with related critical-thinking questions. There are also exercises where you play the role of the healthcare professional in interpreting a patient's condition and rephrasing it as medical language.
- The student media will immerse you in the virtual world of MyMedicalTerminologyLab, where you will explore a variety of fun study opportunities. In one of them, you will listen to real doctors dictating real medical sentences for you to interpret.
- Within MyMedicalTerminologyLab, you will find the video library *Real People, Real Medicine*, which was filmed in association with this book to profile a variety of healthcare professionals on the job.

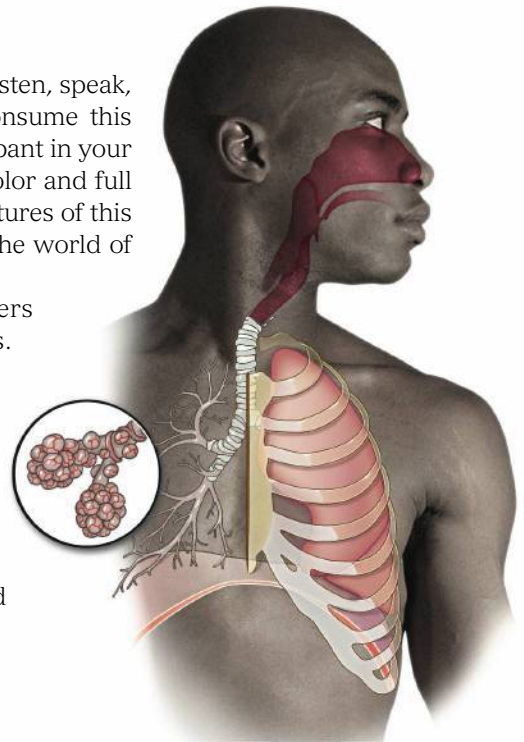
Language

A language is a method of communicating and an expression of the people, events, and culture it represents. This book is about medical language. As opposed to simply memorizing vocabulary words, this book offers a complete experience—the opportunity to embrace the world of health care, just as if you were learning a foreign language. Like traveling to Tokyo for a year to learn Japanese, the goal here is for you to become immersed in the sights and sounds of your new culture of health care. This book surrounds you with context that brings the medical words to life.

A Living Language

You will not be a passive reader of this book. Instead, you will be challenged to listen, speak, write, watch, respond, examine, think, and make connections. You should consume this book by writing notes in it and filling in your answers. By being an active participant in your own learning process, the concepts presented here will come alive in vibrant color and full texture. This book is a *living* document about a *living* language. Through the features of this book and the accompanying multimedia resources, you will get a true taste of the world of health care in *living* color.

You will notice that, unlike other medical terminology books, the chapters in this book are titled by medical specialties, as well as by body systems. This reflects the real world. For example, people with skin conditions visit a dermatologist, not an “integumentary system specialist.” That’s why the related chapter in our book is titled “Dermatology.” A patient with heart problems is treated in a hospital’s cardiology department and not in a “cardiovascular system department.” The decision to present the chapters in this way is an example of a commitment to make this book a realistic reflection of health care as it is in the real world. This distinction was tested extensively, and instructors and students alike overwhelmingly supported and validated this way to learn.



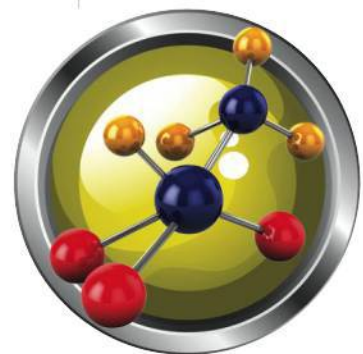
Immerse Yourself!

You are about to begin an interactive learning experience between you, this book, and your instructor—one that will equip you and inspire you to become a true consumer of medical language. The goal of this book is to connect with you, to engage your visual, auditory, and kinesthetic senses, to stimulate you, and to fuel your complete understanding of medical language. As you engage in the multisensory experience within these pages, remember to *discover*, *learn*, *know*, and *understand* the information. But—even more—experience it and *live it!* So dive in and immerse yourself!

New to This Edition

This new third edition maintains the best aspects of previous editions while continuing to facilitate the learner’s mastery of medical language. We have revised this resource so that it provides an even more valuable teaching and learning experience. Here are the enhancements that we have made:

- **New feature box** entitled “Technology in Medicine” addresses important medical advances and cutting-edge technology in medicine.
- Many **new photos** and medically realistic illustrations.
- **New preview pages** to reference the reader to www.MyMedicalTerminologyLab.com.
- **Updated pronunciations** based on medical dictionaries (the recognized authorities on medical language) and enhanced by our own student-friendly, see-and-say pronunciation guide for each bolded word in the text.
- **Updated review exercises** to give readers more practice with dividing and building medical words.
- **Dynamic Lectures**, a comprehensive auditory and visual learning experience, narrated by the author; these include the PowerPoint presentation coordinated with a full lecture, including the author’s many personal experiences in various healthcare fields.



What Makes This Book Different

We Listened

In developing this book over three editions, we have immersed ourselves in the perspective of you, our readers. We have strived to make **Medical Language** a customer-driven text by aggressively and comprehensively researching the needs and desires of current medical terminology students and instructors. We aimed to guarantee that we were “speaking the same language” as those who would ultimately be using this book. To do this, we gathered a highly qualified development team of over 160 reviewers, with over 2,250 years of teaching experience, four physician specialists, as well as 11 students from across the United States to help steer us toward success.

Over the past 11 years we sat in classrooms, hosted focus groups, and conducted thorough manuscript reviews. We asked for blunt and uncompromising opinions and insights. We also commissioned dozens of detailed reviews from instructors, asking them to analyze and evaluate each chapter of the textbook. They not only told us what they did and didn’t like, but they identified, page by page, numerous ways in which we could refine and enhance our key features. Their invaluable feedback was compiled, analyzed, and incorporated throughout **Medical Language**, 3rd edition.

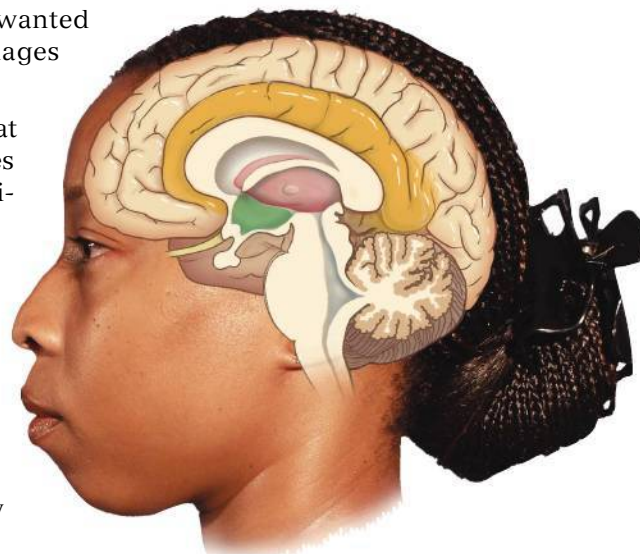
We asked our team to imagine their ideal medical terminology book—what it should include, how it should look. We had the author meet personally with several instructors to discuss the specifics of the book’s organization, layout, format, and features. We asked question after question. This book is truly the product of a successful partnership between the author, the publisher, and our development team of students and instructors. We listened.



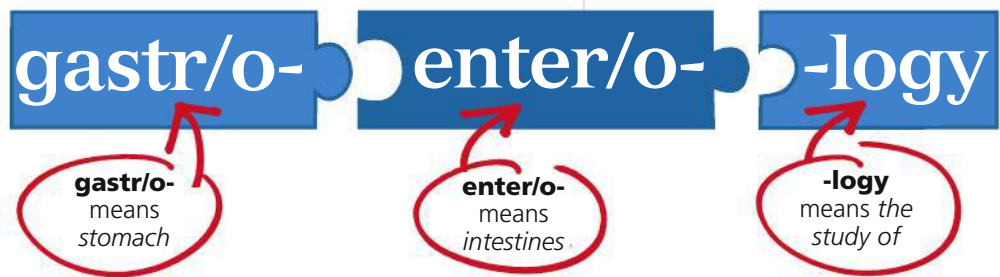
And We Learned

Here are some of the recommendations that we heard from our team, responded to, and included in all three editions:

- **Design** Students and instructors alike told us they wanted an appealing, uncluttered design with lots of rich images and enough white space to allow for notetaking.
- **Exercises** Both students and instructors suggested that we provide a greater quantity and variety of exercises than any other book, thus providing maximum opportunities to reinforce learning.
- **Illustrations** Students and instructors alike suggested that we display colorful and interesting illustrations as large as possible on the page, with opportunities to label those images as practice opportunities.
- **Special Feature Boxes** Students asked for highlighted boxes that would help break up the reading and also provide them with opportunities to learn something new or interesting, thereby providing additional context.



- **Medical Specialties Approach** A substantial majority (75%) of instructors told us that they wanted a medical specialties approach, rather than an approach based only on body systems.
- **Focus on Word Building** Another substantial majority of instructors (over 70%) told us that they wanted a focus on word building with analysis of combining forms, suffixes, and prefixes right with the text and not just at the end of each chapter or in isolated boxes.
- **Medical Report Activities** Instructors wanted an activity in each chapter that challenged students to analyze an actual medical report.
- **Lecture Support Materials** Instructors told us about the increased challenge of creating interesting lectures and suggested that we create a fully loaded PowerPoint presentation system complete with a multitude of illustrations and photographs, plus animations and embedded, real-life medical videos. In addition, we created Dynamic Lectures, a comprehensive auditory and visual learning experience, narrated by the author. It includes the PowerPoint presentation coordinated with a full lecture, including the author's many personal experiences in various healthcare fields.
- **Tools for Testing** Instructors asked for a complete testing package that is customizable to fit their needs. Additionally, they asked for these test items to be available in online course formats.



A Commitment to Accuracy

As part of our respect for real medicine, and the importance of getting it right the first time, we made a commitment to accuracy. It was important to us to attain the highest level of accuracy possible throughout this educational package in order to match the precision required in today's healthcare environment.

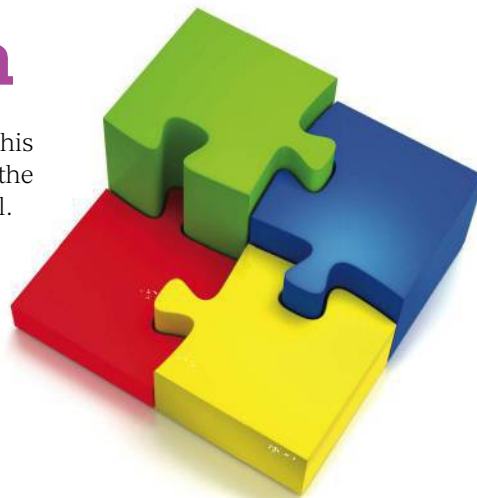
The author drew on her 30 years of experience in nursing, health information management, medical transcription, medical publications, and as a college instructor to provide accurate and complete information. Our development team read every page, every test question, and every vocabulary word. No less than 12 content experts read each chapter for accuracy and analyzed every bit of content in the ancillary resources. We also engaged the technical editing services of four physician specialists who carefully reviewed the chapters that correspond to their respective practices.

We welcome any and all feedback you may have to help us enhance the accuracy of this book. If you identify any errors that need to be corrected in a subsequent printing, please send them to: Pearson Health Science Editorial, Medical Terminology Corrections, 1 Lake Street, Upper Saddle River, NJ 07458.



Our Development Team

We can truly say that each individual on our development team has infused this book with ideas, vision, and passion for medical language. Our team crafted the blueprints for this book and contributed to this landmark educational tool. Their influence will continue to have an impact for decades to come. Let us introduce the members of our team.



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About the Illustrator



The illustrations throughout this book were carefully coordinated through a close collaborative effort between the author and artist. Every figure was custom developed specifically for this book, and refined to be precise, unique, and fresh. From a pedagogical point of view, it was important that all of the art be consistent throughout, rather than presenting a conglomeration of styles and levels of detail.

Anita Impagliazzo is a medical illustrator and designer in Charlottesville, Virginia. A graduate of the University of Virginia, she went on to complete the Biomedical Illustration Graduate Program at the University of Texas Southwestern Medical Center at Dallas and spent several years specializing in illustrating for medical malpractice litigation. She has been self-employed since 2001, planning, creating, and collaborating on artwork for the University of Virginia Health System, for medical malpractice defense attorneys nationwide, and for multiple journals and textbooks (including the popular *Martini Human Anatomy and Physiology* series, and the revered *Netter Collection of Medical Illustrations*). She is a member of the Association of Medical Illustrators and has received several awards in its annual juried salons. She never tires of using medical language to learn new things about the human body: how it works, how it fails, how it is fixed, and how the fixing fails.

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