Welcome!

Welcome to Medical Terminology Complete! You have chosen an exciting time to begin a career as a healthcare professional. The healthcare industry is a dynamic field that is filled with opportunities for those who care about helping other people. Although many aspects of health care remain relatively constant, research breakthroughs occur each year to keep us moving forward in the war against human suffering. And you can be a part of this exciting process!

This book is designed to help you through the process of building a medical vocabulary. It teaches you the language by using a method known as programmed learning. With this approach, you read through the information at your own pace, one small box (or frame) at a time. Within most frames are blanks, which you fill in as you read. The answers to the blanks are provided in the left column, making it easy and quick to check your answer to make sure you are on the right track. To maximize your learning experience, it is best to cover the answers in the left column until you have filled in the blanks on your own. Challenge yourself! By filling in the blanks as you read, you become an active learner, which improves your chance of successfully mastering medical terminology. You’ll have the opportunity to learn thousands of medical terms, and our simple goal is to provide you with the tools and confidence to help you master this brand new vocabulary.

You may be wondering about the title of this book: Medical Terminology Complete! Let us explain the two goals we had in mind as we developed this text.

1. To place a complete resource at your fingertips. With its interactive format and its wealth of clear definitions, vivid images, practical examples, and challenging exercises, it’s all that you need to become proficient in speaking and understanding the language of medicine.

2. To allow you to complete the exercises on every page. This book features a programmed method that prompts you, the reader, to fill in the content as you read. This approach keeps your pen or pencil on every page, so you stay engaged and retain more.

Now please turn the page to get a glimpse of what makes this book an ideal guide to your exploration of medical terminology.
Discover What Makes This Book Unique

This section provides you with a snapshot of what makes this book special. Consider this your user’s manual to the book and all the accompanying resources that are available to you.

Diseases and Disorders of the Male Reproductive System

Here are the word parts that specifically apply to the diseases and disorders of the male reproductive system and are covered in the following section. Note that the word parts are color-coded to help you identify them: prefixes are yellow, combining forms are red, and suffixes are blue.

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Definition</th>
<th>Combining Form</th>
<th>Definition</th>
<th>Suffix</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>an-</td>
<td>without, absence of</td>
<td>andr/o</td>
<td>male</td>
<td>-cele</td>
<td>hernia, swelling, or protrusion</td>
</tr>
<tr>
<td>hyper-</td>
<td>excessive, abnormally</td>
<td>balan/o</td>
<td>glans penis</td>
<td>-ism</td>
<td>condition or disease</td>
</tr>
<tr>
<td>para-</td>
<td>alongside, abnormal</td>
<td>crypt/o</td>
<td>hidden</td>
<td>-itis</td>
<td>inflammation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>epididym/o</td>
<td>epididymis</td>
<td>-pathy</td>
<td>disease</td>
</tr>
<tr>
<td></td>
<td></td>
<td>hydr/o</td>
<td>water</td>
<td>-plasia</td>
<td>formation, growth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>orchi/o, orchid/o</td>
<td>testis</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>prostat/o</td>
<td>prostate gland</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>varic/o</td>
<td>dilated vein</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Color-Coded Word Parts

Prefixes, combining forms, and suffixes are each designated by a unique color—making it easier for you to visually recognize the distinctions between each word part, thereby aiding in your mastery of word building.

Key Terms A–Z

The most important terms are listed in alphabetical order, helping you to easily review those important terms before an exam.

Programmed Instruction

This format allows you to learn actively but at your own pace, filling in blanks as you read. Answers appear in the left column, making it easy and quick to check your answer to make sure you are on the right track. Programmed instruction works best when you cover the answers in the left column until you fill in the blanks. If you remember to do this, it will keep your studies challenging, and your learning experience will benefit.
Medically Accurate Illustrations
Concepts come to life with vibrant, clear, consistent, and scientifically precise images.

Image Labeling Frames
These frames provide you with opportunities to actively engage with the illustrations, helping to reinforce your knowledge of anatomy. They are included in the Chapter Review section at the ends of Chapters 5–15 and are new to this edition.
-Word Building, Step by Step
At-a-glance tables provide a preview of the word parts and definitions you’ll learn in each framed section that follows. Then, in the frame for each constructed term, word part reminders show how the individual word part meanings combine to form the constructed term. Word part breakdowns show, by using slash marks, how the constructed term is broken down. Word parts are colored here, too, for further word building reinforcement.

15.25 The excessive production of PTH by the parathyroid glands is a disorder known as **hyperparathyroidism**. This lengthy term contains four word parts: `hyper/para/thyroid/ism`. Usually caused by a tumor, it results in excessive calcium levels in the blood, or hypercalcemia (Frame 15.23). In the opposite condition called __________, PTH levels are reduced and the condition of hypocalcemia (Frame 15.23) occurs. The constructed form of this term is __________/________/________/________.

**Did You Know?**
These special frames reveal fascinating facts about the Latin or Greek origins of a medical term and provide interesting, relevant facts and figures.

**-pexy or -plasty?**
The meanings of these two suffixes both relate to surgery—but they are very different forms of surgery. Remember that `pexy` means "surgical fixation, suspension," and `plasty` means "surgical repair." One way to remember the meaning of -pexy is that it uses an `x`, as does the word fixation in its definition. Similarly, a way to remember the meaning of -plasty is that it uses a `p`, as does the word repair in its definition.

**Words to Watch Out For!**
These special frames provide tips about commonly misspelled or error-prone terms and word parts.

**Practice Exercises**
These are exercises that follow each chapter subsection and provide opportunities to pause and review with practices such as **The Right Match, Linkup, and Break the Chain**.

**PRACTICE: Signs and Symptoms of the Digestive System**

<table>
<thead>
<tr>
<th>The Right Match</th>
<th>Match the term on the left with the correct definition on the right.</th>
</tr>
</thead>
<tbody>
<tr>
<td>_____ 1. dysphagia</td>
<td>a. backward flow of material in the GI tract</td>
</tr>
<tr>
<td>_____ 2. reflux</td>
<td>b. gas trapped in the GI tract</td>
</tr>
<tr>
<td>_____ 3. flatus</td>
<td>c. difficulty in swallowing</td>
</tr>
<tr>
<td>_____ 4. halitosis</td>
<td>d. infrequent or incomplete bowel movements</td>
</tr>
<tr>
<td>_____ 5. ascites</td>
<td>e. frequent discharge of watery fecal material</td>
</tr>
<tr>
<td>_____ 6. diarrhea</td>
<td>f. bad breath</td>
</tr>
<tr>
<td>_____ 7. nausea</td>
<td>g. from the French word for yellow</td>
</tr>
<tr>
<td>_____ 8. constipation</td>
<td>h. a symptomatic urge to vomit</td>
</tr>
<tr>
<td>_____ 9. jaundice</td>
<td>i. accumulation of fluid in the peritoneal cavity</td>
</tr>
</tbody>
</table>

**-endoscopy**
Laparoscopy. A lighted endoscope specialized for viewing reproductive organs. Called a **laparoscope**, is used for excision of structures. Outfitted with surgical devices, these are exercises that follow each chapter subsection and provide opportunities to pause and review with practices such as **The Right Match, Linkup, and Break the Chain**.
CHAPTER REVIEW

Word Building

Construct medical terms from the following meanings. (Some are built from word parts, some are not.) The first question has been completed as an example.

1. inflammation of the larynx
   laryngitis
2. absence of oxygen
   oxia
3. inflammation of the bronchi
   bronchitis
4. respiratory failure characterized by atelectasis
   respiratory
5. physical exam that includes listening to body sounds
   (do this one on your own!)
6. deficient oxygen levels in the blood
   hypoxia
7. difficulty breathing
   pnea
8. excessive carbon dioxide levels in the blood
   hyperpnea
9. abnormal dilation of the bronchi
   bronchi
c10. lung inflammation due to dust inhalation
   bronchogenic
11. cancer arising from cells within the bronchi
   bronchogenic
12. an inherited disease of excessive mucus production
   cystic
13. inflammation of the trachea
   tracheitis
14. the absence of respiratory ventilation
   sphyxia
15. x-ray image of the bronchi
   broncho
16. surgical puncture and aspiration of fluid from the pleural cavity
   thora
17. measurement of oxygen levels in the blood
   oxim

Define the Combining Form

This review gives you the opportunity to practice your new knowledge in the definitions of combining forms found in the chapter and provide an example of how a combining form may create a term (new to this edition).

<table>
<thead>
<tr>
<th>Definition</th>
<th>Use in a Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. gastr/o</td>
<td></td>
</tr>
<tr>
<td>2. cholecyst/o</td>
<td></td>
</tr>
<tr>
<td>3. choledoch/o</td>
<td></td>
</tr>
<tr>
<td>4. enter/o</td>
<td></td>
</tr>
<tr>
<td>5. duoden/o</td>
<td></td>
</tr>
<tr>
<td>6. gingil/o</td>
<td></td>
</tr>
<tr>
<td>7. col/o</td>
<td></td>
</tr>
<tr>
<td>8. pept/o</td>
<td></td>
</tr>
</tbody>
</table>
Complete the Labels

This review of basic anatomy asks you to complete the labeling of illustrations. The fully labeled illustrations are provided at the beginning of the chapter in the Anatomy and Physiology Terms section (new to this edition).

Medical Report Exercises

These scenarios combine the use of medical case studies and comprehension questions to help you develop a firmer understanding of the terminology in a real-world clinical context.

MEDICAL REPORT EXERCISES

Anita Del Rio

Read the following medical report, then answer the questions that follow.

PEARSON GENERAL HOSPITAL

5500 University Avenue, Metropolis, New York
Phone: (211) 594-4000 • Fax (211) 594-4001

Medical Consultation: Pediatrics Date: 09/07/2017
Patient: Anita Del Rio Patient ID: 123456
Dob: 1/15/2004 Age: 13 Sex: Female Allergies: NKDA
Provider: Jonathon McClary, MD

Subjective:
“I’m really tired most of the day, mostly between meals, and getting behind in school. I get real thirsty a lot, and it seems like I need to use the bathroom 20 times a day! Lately, I’ve also been getting headaches a lot and have trouble falling asleep at night.”

13 y/o female complains of malaise, polydipsia, polyuria, cephalalgia, and insomnia. Although full of pep in the clinic during her visit, her mother supports her complaints and is very concerned with her lack of energy. No medical history available.

Objective:
Vital Signs: T: 98.6°F; P: 80; R: 22; BP: 120/75
Ht: 5’1”
Wt: 90 lb

General Appearance: Skin appears healthy, with no apparent masses or discolorations.

Heart: Rate at 80 bpm. Heart sounds with auscultation appear normal.

Lungs: Clear without signs of disease.

AbD: Bowel sounds normal all four quadrants.

HEENT: No abnormalities present.

Lab: Ketone bodies elevated, mild acidosis pH 7.3; FBS 220 confirmed with GTT

Assessment:
Diabetes mellitus type 1

Plan:
Treat as type 1 DM with regular insulin injection regimen and enroll with parent in diabetes management class.

Photo Source: Scott Griessel/Fotolia.
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 Complete!, fourth edition. With MyLab Medical Terminology, you can track your own progress through your entire medical 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 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 MyLab Medical Terminology

Pre-Tests and Post-Tests. Using questions aligned to the learning outcomes in Medical Terminology Complete!, 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 guidebook.
- Monitor student activity with viewable student assignments.

Comprehensive Instructional Package

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

*Medical Terminology Complete!* presents the most current and accepted language of health care in a programmed learning approach. It has helped prepare thousands of students for careers in health professions by providing a self-guided tool for learning medical terminology. The book may be used as a text to support lectures and online courses or as an independent student workbook. The flexibility of its application is made possible by the book’s text-like format combined with its self-guided learning program, self-assessment questions, and reinforcement exercises. To provide an optimum learning format, the text discussions are basic, clear, and concise. The programmed learning modules are simple and easy to follow, and the self-assessment questions and exercises provide reviews and clinical applications of the information at frequent intervals.

New to This Edition

Based on extensive feedback from students and instructors, we have revised *Medical Terminology Complete!* so that it provides an even more valuable teaching and learning experience than previous editions. Here are the enhancements we have made:

- All chapters have been carefully reviewed and edited to complete a shift from a biological perspective to a more clinical perspective, thereby providing improved clinical training for students poised to enter healthcare careers.
- All selected terms have been carefully screened for current accuracy, with outdated terms removed and new terms added to bring the text up-to-date.
- Many new photographs and several new illustrations have been added to help learners more easily visualize the concepts and meanings of selected terms.
- Additional Chapter Review exercises at the end of chapters 5-15 have been added to give students more practice with reviewing chapter terms, including Define the Combining Form and Complete the Labels.
- The online support has been improved to provide easier access and enhancements to interactive learning, making this edition a valuable learning tool for online courses in medical terminology.

The Programmed Approach

Each learning frame contains a clear and concise statement, usually describing a single medical term. This allows learners to focus on one term at a time. Each frame includes at least one blank space, which can be completed based on clues within the frame. The answer to the blank is provided in the left column. Students can either cover the answer column or leave it uncovered. Either way, the kinesthetic component of filling in the blank provides another level of learning that ensures retention.

Each body systems chapter presents the most important terms (or “Key Terms”) in the answer column with color-coded word parts, where applicable, as well as a phonetic pronunciation. Prefixes appear in yellow; combining forms are red; and suffixes are blue.
An added benefit of this Key Terms answer column is that the terms are presented in alphabetical order, which provides a way for students to quickly review the priority terms. Other terms that are related to the Key Terms in the answer column, but not as vital for the student to understand, are presented in the main frame section in boldface type.

The self-study features enable students to learn with a minimum of instructor guidance. In addition to the programmed learning frames, other self-study features include blocks of review questions (Practice) that are placed at frequent intervals throughout each chapter. In these sections, students have the opportunity to test their understanding by answering questions in The Right Match, Linkup, and Break the Chain activities. Answers to these activities, along with those for the end-of-chapter review questions, appear in Appendix E located at www.pearsonhighered.com/healthprofessionsresources.

The book also includes boxes intended to promote additional interest in medical terminology. They include Did You Know? boxes, which reveal fascinating facts about the Latin or Greek origins of a medical term and provide interesting and relevant facts and figures that draw a connection between a particular term and its clinical point of interest, and Words to Watch Out For! boxes, which provide tips about commonly misspelled or error-prone terms and word parts.

Chapter Format

Each chapter begins with a brief list of Learning Objectives. In each chapter beginning with Chapter 5, a brief review of the structure and function of the particular body system discussed in the chapter follows the objectives. The section is titled Anatomy and Physiology Terms, and it begins with an at-a-glance table with the major combining forms and definitions for that body system. The Anatomy and Physiology section then presents a limited number of learning frames—enough to give students an opportunity to review essential anatomy and physiology, without overwhelming them or providing redundancy to students who have already taken an anatomy course as a prerequisite. The illustrations accompanying this section provide a visual review of anatomy.

The primary text of each chapter consists of a brief narrative introduction discussing the pathophysiology of the body system, followed by numerous programmed learning frames and Practice exercises that are divided into three sections:

- Signs and Symptoms
- Diseases and Disorders
- Treatments, Procedures, and Devices

An Abbreviations listing and a Practice exercise follow to conclude the teaching portion of the chapter.

Finally, a Chapter Review section provides several review exercises, including Word Building and Medical Report Exercises with two medical reports and case studies. New to this edition are additional chapter review exercises, including Define the Combining Form and Complete the Labels.
Organization of the Book

The organization of this text is unique in that it provides a slow, building approach to teaching medical terminology. Students can often be overwhelmed by this new language, so here’s what we’ve done to address this and make the learning experience more comfortable for students:

■ The text begins with three chapters devoted exclusively to word building and word parts. Chapter 1 provides an introduction to medical terminology and to the programmed learning approach. Basic definitions of terminology and word construction are first described here. Also, the importance of learning the most common Latin and Greek word parts is emphasized as a starting point. Chapter 2 provides an opportunity for students to learn the common suffixes that are in frequent use in building medical terms. Chapter 3 covers prefixes and their common uses in medical terms. We then present Chapter 4, which introduces anatomy and physiology word roots and combining forms, both of which create the foundation for the majority of medical terms. This chapter also introduces other foundational terms, such as anatomical and directional terms. This allows the student to take a slow, logical approach to learning word parts and word building.

■ Then, the student can put that knowledge to work and learn about medical terms as they apply to each body system. The body system chapters progress from the least complex body system ( integumentary) to the most complex body system (endocrine), with a sequence that parallels most courses in anatomy and physiology. This approach enhances learning by allowing students to build confidence as they work their way through the chapters.

Appendix A provides a complete glossary of all word parts that are presented in the text, along with their definitions. Appendix B lists abbreviations commonly used in the healthcare professions. Appendix C provides word parts for describing color, number, and plurals. In Appendix D (online), common terms used in pharmacology are included for your reference. Appendix E (online) provides the answers to the Practice exercises and to the end-of-chapter Chapter Review questions. All online materials can be found at www.pearsonhighered.com/healthprofessionsresources.

A glossary/index concludes the book, providing a quick and handy reference.

I invite and welcome your reactions, comments, and suggestions to be sent to me directly so that subsequent editions may reflect your educational needs even better.

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About The Author

Bruce Wingerd is a member of the Biology Department at National University in San Diego, California. Previously, he has held teaching/administrative positions at Edison State College (now called Florida Southwestern State College), Broward College, and San Diego State University. Professor Wingerd’s degrees are in the fields of zoology and physiology, and he has taught courses in medical terminology, human anatomy, advanced human anatomy, and anatomy and physiology for more than 30 years. He has written numerous textbooks, lab manuals, and multimedia learning resources in medical terminology, human anatomy, anatomy and physiology, histology, and comparative mammalian anatomy. Professor Wingerd’s goal in teaching and writing is to provide students with learning tools that will help them reach their potential through education. He enjoys counseling students in the health sciences, developing novel approaches to teaching and learning, and leading faculty in the drive for excellence in education.

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 more than 15 years, his passion has been to condense complex anatomical information into visual education tools for students, patients, and medical professionals.

Body Scientific’s lead artists in this publication were medical illustrators Carol Hrejsa, Liana Bauman, and Katie Burgess. They each hold Master of Science degrees in Biomedical Visualization from the University of Illinois at Chicago. Their contribution was the creation and editing of clear, effective, vibrant, and medically accurate artwork throughout.
Acknowledgments

This book is the product of collective hard work from a talented team focused on creating a unique learning tool.

Our team received its original direction from then-Editor-in-Chief Mark Cohen, who provided the vision and energy to launch this project into its first edition and continue with improvements into the second edition. The third edition and now this new fourth edition were spearheaded and supported by our present Portfolio Manager, John Goucher, who shared in our collective vision for a unique learning tool. I am filled with gratitude for his support to produce a fourth edition. I also appreciate the efforts of Elena Mauceri of DynamicWordWorks, Inc. who brought an outstanding developmental editor to join our team for the third edition and now the fourth edition, Jennifer Maybin of Editor in the Woods, LLC. Jennifer made many helpful suggestions and contributions through her dedicated hard work on every line of the textbook, and her many contributions are highly appreciated.

Many other talented people worked hard to make this book a valuable teaching and learning resource. I extend to each of them my warmest gratitude:

Melissa Bashe, Content Producer, who coordinated the development of a world-class teaching and learning package.
Lisa Narine, Portfolio Management Assistant, who executed the complex process of managing our peer review program.
Marcelo Oliver and his team of medical illustrators at Body Scientific International, LLC, who created a dynamic, clear, and precise art program.
Meghan DeMaio, Editorial Project Manager for SPi Global, who directed the flow of textual and visual content throughout the production of the book and ancillary materials.
Patty Donovan and Thomas Russell, Production Editors for SPi Global, who oversaw the copyediting and page composition processes.
Our Development Team

The fresh, unique vision, format, and content contained within the pages of Medical Terminology Complete! comes as a result of an incredible collaboration of expert educators from around the United States. This book represents the collective insights, experience, and thousands of hours of work performed by members of this development team. Their influence will continue to have an impact for decades to come. Let us introduce the members of our team.

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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. No fewer than 12 content experts have read each chapter for accuracy. In addition, some members of our developmental team were specifically assigned to focus on the precision of each illustration that appears in the book.

2. Medical Illustrations—A team of medically trained illustrators was hired to prepare each piece of art that graces the pages of this book. These illustrators have a higher level of scientific education than the artists for most textbooks, and they worked directly with the author 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—The teaching and learning ancillaries are often as important to instruction as the textbook itself. Therefore, we took steps to ensure accuracy and consistency of these by reviewing every ancillary component. The author and editorial team studied every PowerPoint slide and online course frame to ensure the context was correct and relevant to each lesson.

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*Appendix D and Appendix E can be found online at www.pearsonhighered.com/
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