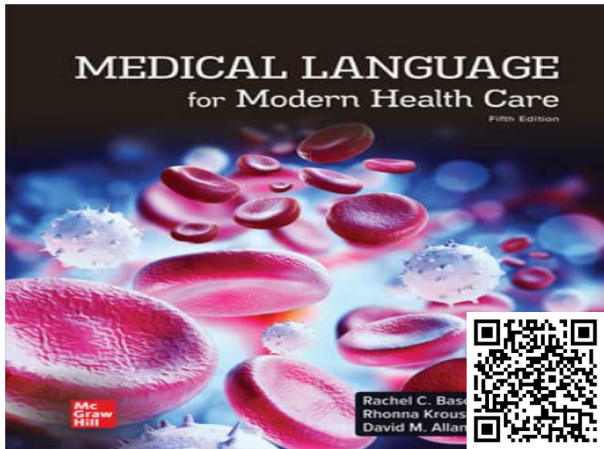


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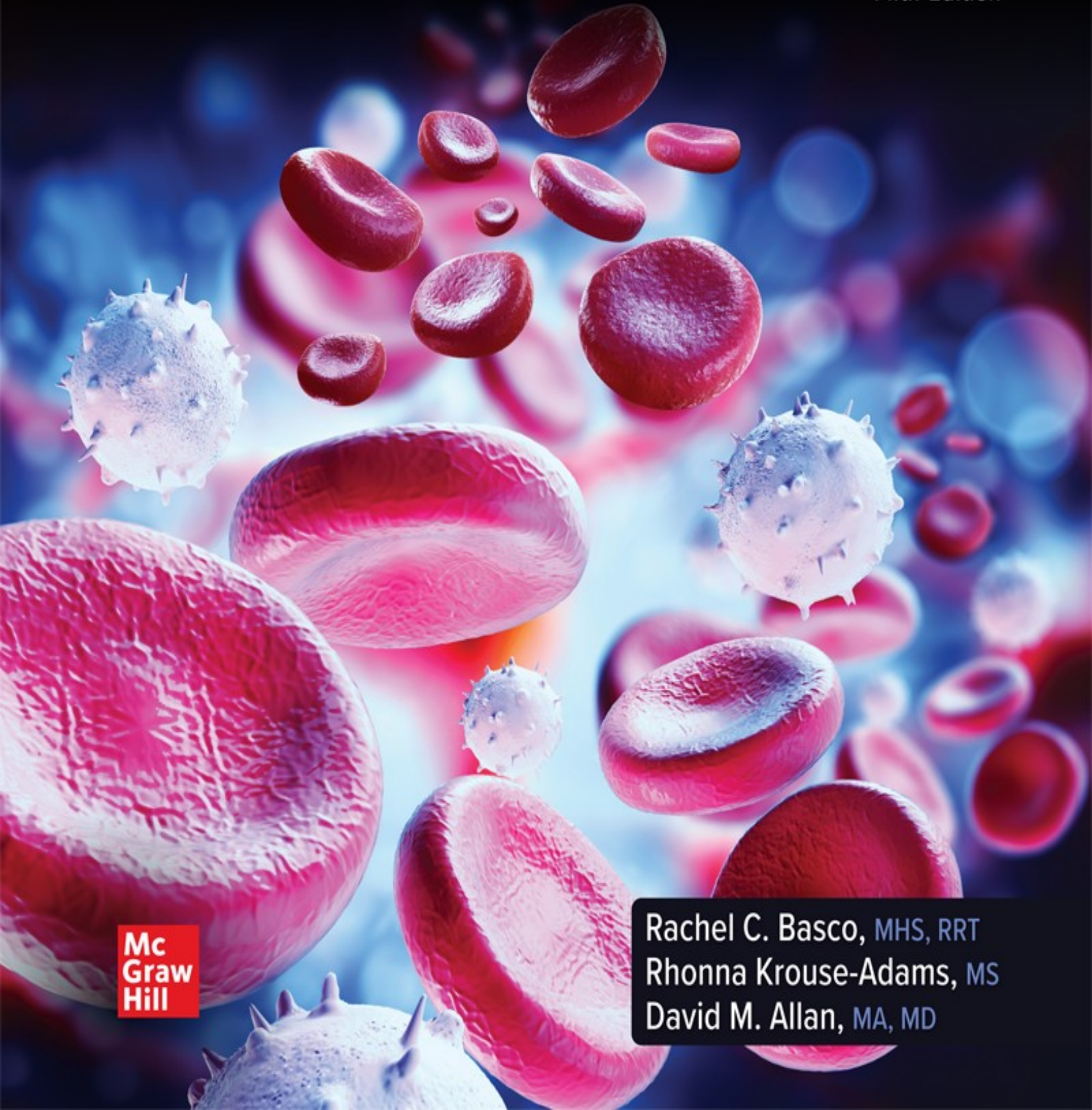
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# MEDICAL LANGUAGE

## for Modern Health Care

Fifth Edition



**Mc  
Graw  
Hill**

Rachel C. Basco, MHS, RRT  
Rhonna Krouse-Adams, MS  
David M. Allan, MA, MD

# **Medical Language For Modern Health Care**

**Fifth Edition**

**Rachel C. Basco, MS, RRT**

Bossier Parish Community College

**Rhonna Krouse-Adams, MS**

College of Western Idaho

**David M. Allan, MA, MD**





MEDICAL LANGUAGE FOR MODERN HEALTH CARE

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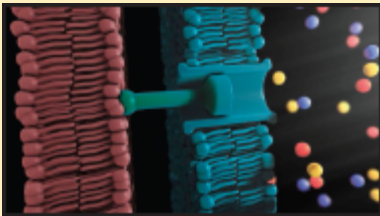
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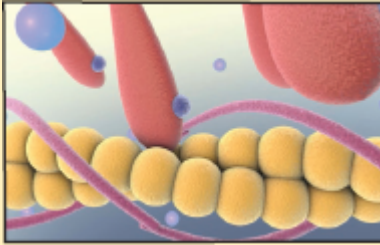


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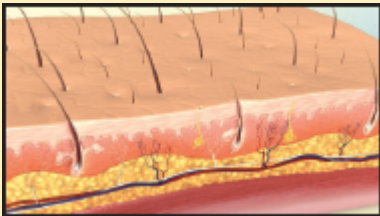
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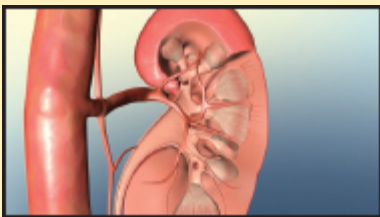
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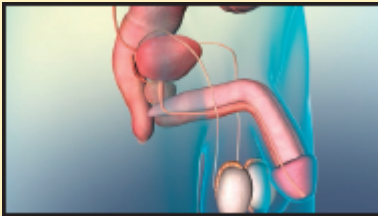
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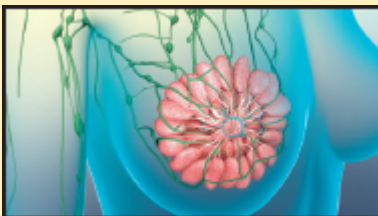
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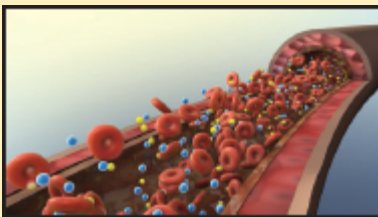
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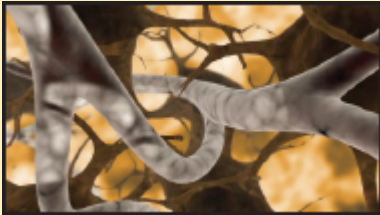
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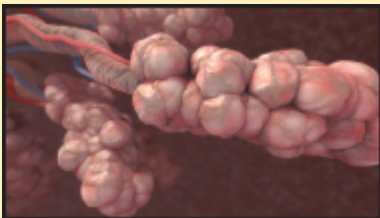
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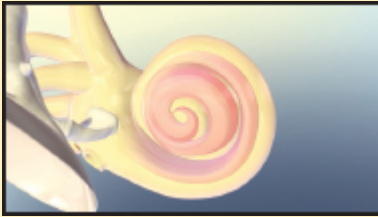
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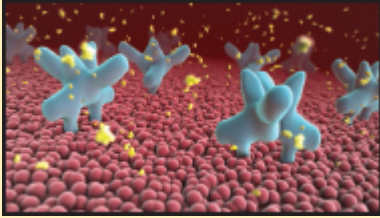
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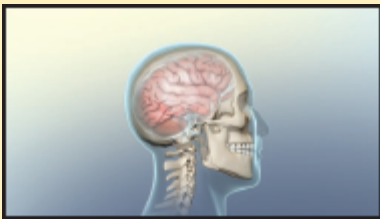
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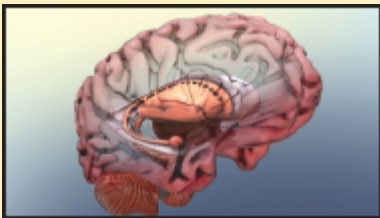
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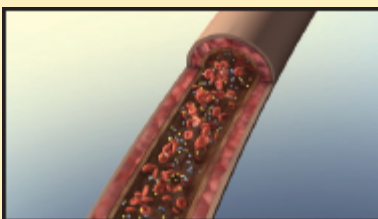


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## ACKNOWLEDGMENTS

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## **PREFACE**

Medical terminology is not just another subject for which you memorize the facts and then forget them when you move on to your next course. Medical language will be used throughout your studies, as well as every day on your job. Health care professionals use specific terms to describe and talk about objects and situations they encounter each day.

Like every language, medical terminology changes constantly as new knowledge is discovered. Modern medical terminology is a language constructed over centuries, using words and elements from Greek and Latin origins as its building blocks. Some 15,000 or more words are formed from 1,200 Greek and Latin roots. It serves as an international language, enabling medical scientists from different countries and in different medical fields to communicate with a common understanding.

In your world as a health care professional, medical terminology enables you to communicate with your team leader, with other health care professionals on your team, and with other professionals in different disciplines outside your team. Understanding medical terminology also enables you to translate the medical terms into language your patients can understand, thus improving the quality of their care and demonstrating your professionalism. Your understanding of medical terminology will make you a successful student and health professional.

## **ORGANIZATION OF CONTENT**

In this new edition, chapters have been organized for consistency and continuity to enhance student retention. For all major organ systems, the chapters will be placed in sections and will begin with an overview of the

anatomy and physiology of the system. The following section will cover the common pathology associated with that organ system. The final sections will cover diagnostic and therapeutic procedures along with pharmacology. Each chapter is structured around a consistent and unique framework of learning devices including illustrations, Word Analysis and Definition (WAD) tables, and end-of-section Checkpoints. Regardless of the organ system being covered, the structure enables you to develop a consistent learning strategy, making the fifth edition of Medical Language For Modern Health Care a superior learning tool.

### **Word Analysis and Definition Boxes and Case Reports**

The medical terms covered in each lesson are introduced in context and then to facilitate easy reference and review, the terms also are listed in boxes as a group. The **Word Analysis and Definition (WAD) boxes** list the term and its pronunciation, elements, and definition in a concise, color-coded, at-a-glance format. **Case Reports** can be found within Checkpoints and Chapter-End exercises providing the students opportunities to apply and reinforce their knowledge of medical terms.

### **Section and Chapter-End Exercises**

Each section ends with exercises designed to allow you to check your basic understanding of the terms you just learned. These checkpoints can be used by instructors as assignments or in-class activities or by students for self-evaluation.

At the end of each chapter, you will find chapter review of exercises that ask you to apply what you learned in all the lessons of a chapter. These exercises reinforce learning of each chapter's terms and help you go beyond mere memorization to think critically about the page xiii medical language you use. In addition to reviewing and recalling the definitions of terms learned in the chapter, you will be asked to use medical terms in new and different ways.

### **Additional Learning Tools**

Did you know? boxes appear throughout each chapter and provide additional interesting pieces of information that related to the chapter content. Each chapter also includes an abbreviation table and a Disorder or Disease table.

## **NEW TO THE FIFTH EDITION:**

- Learning outcomes have been streamlined for each chapter for easy organization and assessment.
- Every chapter has been reorganized into sections that are consistent across all chapters.
- Chapters have been updated with the latest trends in medicine, including COVID-19.
- The case studies have been enhanced to support practical application of the terms learned.
- Pronunciation questions have been added to each chapter to develop effective communication.
- Multiple new activities have been added to the instructor manual to enhance in-person and online learning.

## **NEW TO CONNECT WITH THE FIFTH EDITION:**

- All Connect questions are now tagged to CAAHEP and ABHES requirements for easy assessment and reporting for accreditation.
- All new activities were added to support medical terminology fundamentals for each organ system.
- New Application-Based Activities bring pathology to life for your students.

## **INSTRUCTOR RESOURCES**

The following materials are available to help you and your students work through the material in the book; all are available in the Instructor Resources under the Library tab in Connect (available only to instructors who are logged in to Connect).

- Instructor's Manual
- PowerPoint Presentation
- Answer Keys
- Test Bank



## Instructors: Student Success Starts with You

### Tools to enhance your unique voice

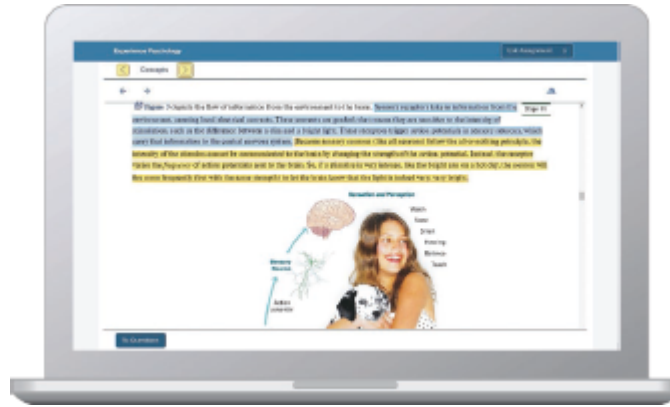
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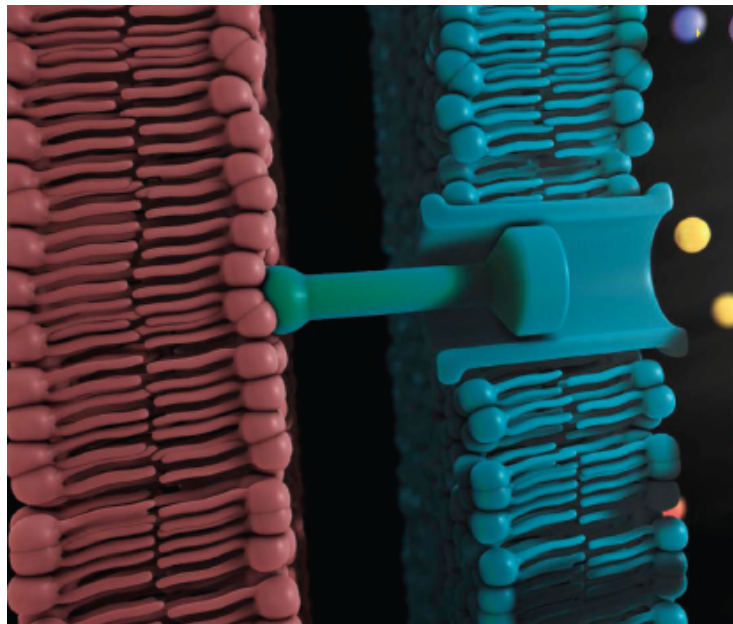


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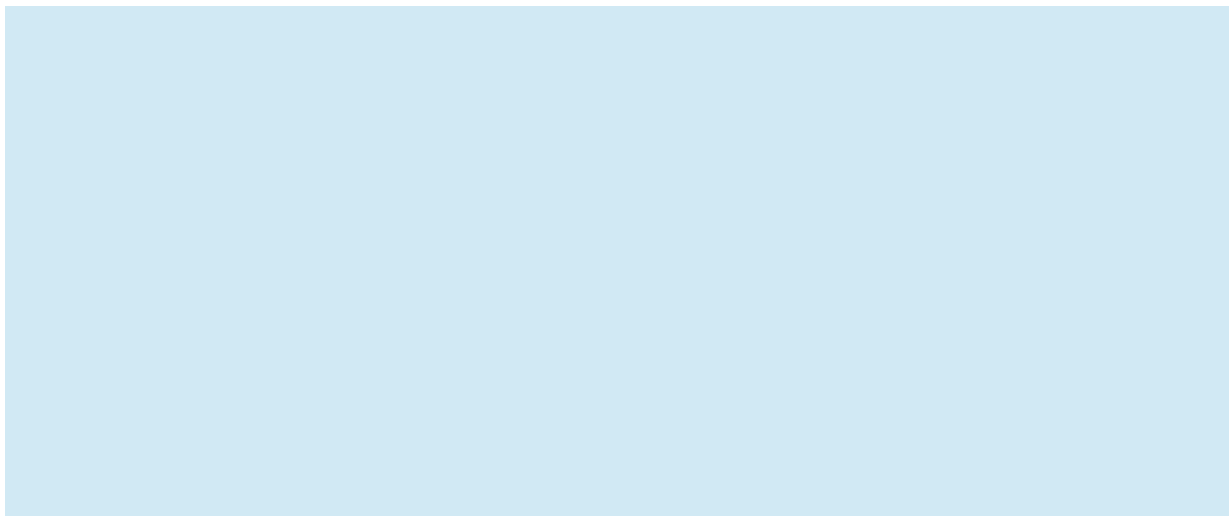
## CHAPTER

# 1

## The Anatomy of Medical Terms The Foundation of Medical Language



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## **Chapter Sections**

**1.1** Roots and Combining Forms

**1.2** Suffixes

**1.3** Prefixes

**1.4** Unique Medical Words

## Chapter Learning Outcomes

- LO 1.1** Identify and utilize the **roots** and **combining forms** to form medical terms.
- LO 1.2** Identify and utilize **suffixes** and **prefixes** to build medical terms.
- LO 1.3** Recognize medical terms taken directly from Greek, Latin, or Old English words.
- LO 1.4** Differentiate between medical terms that are spelled and/or pronounced similarly.

The technical language of medicine has been developed logically from Latin and Greek roots because it is in Latin and Greek cultures that the concept of treating patients began. This medical language provides all the health professionals involved in the care of a patient with the ability to communicate with each other by using medical terms with precise meanings. To be a qualified health professional it is necessary to be able to speak the language of medicine.

Medical terms are built from individual parts, or elements, that form the anatomy of the word. Upon completion of this chapter, you will be able to.

## Section 1.1 Roots and Combining Forms

### The Logic of Medical Terminology

Understanding and being comfortable with the technical language of medicine are keys to a successful career as a health professional. Your ability to use and understand the technical language to communicate verbally and in writing are essential for patient safety, high-quality patient care, precise interaction with other health professionals, and your own self-esteem as a health professional.

Your confidence in using medical terms will increase as you understand the logic of how each term is built from its individual parts, or elements. In addition, understanding the logic of this process will help you analyze or deconstruct an unknown medical term and break it down into its elements so that its meaning can be understood.

The **elements** of a medical term are its **roots**, **suffixes**, and **prefixes**, and the vast majority of these elements are derived from Latin and Greek origins. Throughout this book, when words are broken down, the elements will be color coded.

Throughout this book, look for the following patterns:

- **Roots**, **combining forms**, and **combining vowels** will be colored **pink**.
- **Prefixes** will be colored **green** and come before the root.
- **Suffixes** will be colored **blue** and come after the root.

This will be discussed in greater length.

### Roots

Every medical term has a **root**—the element that provides the core meaning of the word. A **root** is the constant foundation and core of a medical term.

- **Roots** are usually of Greek or Latin origin.
- All medical terms have one or more **roots**.
- A **root** can appear anywhere in the term.
- More than one **root** can have the same meaning.
- A **root** plus a **combining vowel** creates a **combining form**.
- The word *pneumonia* has the **root pneumon-**, taken from the Greek word meaning *lung* or *air*. The Greek **root pneum-** also means lung or air. *Pneumonia* is an infection of the lung tissue.
- The **root pulmon-** is taken from the Latin word meaning *lung*. A *pulmonologist* is a specialist who treats lung diseases.

### Combining Forms

**Roots** are often joined to other elements in a medical term by adding a **combining vowel**, such as the letter “o,” to the end of the **root**, like **pneum-**, to form **pneum/o-**.



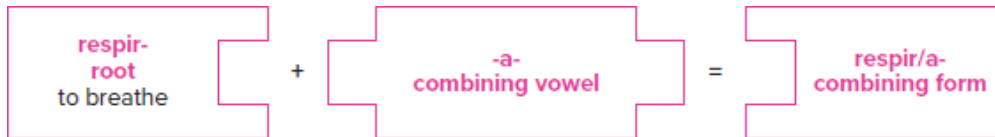
Throughout this book, whenever a term is presented, a **slash (/)** will be used to separate the combining vowel from the **root**. Other examples of this approach are as follows:

- Adding the **combining vowel “o”** to the Latin **root pulmon-** makes the **combining form pulmon/o-**.

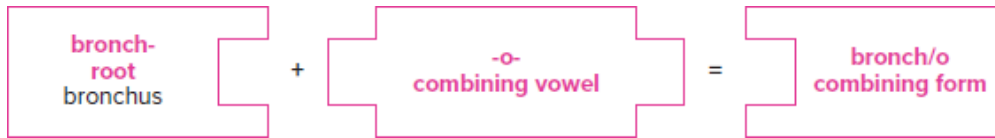


Any vowel, “a,” “e,” “i,” “o,” or “u,” can be used as a **combining vowel**.

- The **root respir-** means *to breathe*. Adding the **combining vowel “a”** makes the **combining form respir/a-**.

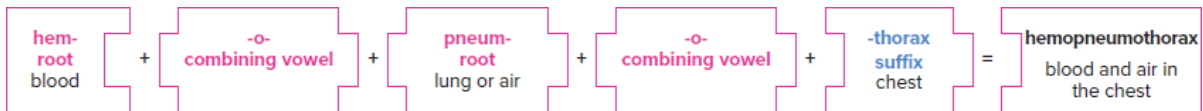


- The **root bronch-** is derived from the Greek word for *windpipe* and is one of the two subdivisions of the trachea that carry air to and from the lungs. Adding the **combining vowel “o”** to the **root bronch-** makes the **combining form bronch/o-**.



Many medical terms contain more than one **root**; when two roots occur together, they are always joined by a **combining vowel**, as in the following example:

- The word **hemopneumothorax** has the **root hem-**, from the Greek word meaning *blood*; the **root pneum-**, from the Greek word meaning *air* or *lung*; and the **suffix -thorax**, from the Greek word meaning *chest*. The **combining vowel “o”** is added to these two roots to make the **combining forms hem/o** and **pneum/o-**. A combining vowel is used to join a root (**pneum-**) to a suffix that begins with a consonant (**-thorax**). A **hemopneumothorax** is the presence of air and blood in the space that surrounds the lungs in the chest. As blood and air fill the pleural cavity, the lungs cannot expand and respiration is not possible, thus forcing the affected lung to collapse.



- Different **roots** can have the same meaning. **Pulmon-** and **pneumon-** both mean *lung, air*.

# Check Point Section 1.1

**A. Review what you have just learned about roots and combining forms.** *Select the correct answer to the statement.* **LO 1.1, 1.2**

**root combining form combining vowel suffix prefix**

1. Roots and combining forms can go before a \_\_\_\_\_.
2. This element does not have a meaning; it serves to make the word easier to pronounce: \_\_\_\_\_.
3. A \_\_\_\_\_ can go before a root.
4. The \_\_\_\_\_ is the root plus a combining vowel.

**B. Identify the word parts of a medical term.** *Use the provided medical term to correctly answer the questions.* **LO 1.1**

1. In the word **pneumonia**, the root is:
  - a. *pneum-*
  - b. *pneumon-*
  - c. *-ia*
  - d. *-nia*
2. In the medical term **pulmonologist**, the root is:
  - a. *pulm-*
  - b. *pulmon-*
  - c. *-logist*
  - d. *-gist*
3. The combining vowel in the medical term **respiratory** is:
  - a. *-a-*
  - b. *-o-*
  - c. *-i-*
  - d. *-e-*

## Section 1.2 Suffixes

A **suffix** is a group of letters positioned at the end of a medical term. It attaches to the end of a **root** or **combining form**. **Suffixes** can have more than one meaning. If a **suffix** begins with a consonant, add a **combining vowel** to the **root**. If a **suffix** starts with a vowel, no **combining vowel** is needed. An occasional medical term can have two **suffixes**. For example, the **root gene-**, meaning origin or gene, is teamed with the **suffix -tic**, which means pertaining to, to form the word genetic, *pertaining to a gene*. Again, the **root gene-** is teamed with the **suffix -tics**, which means *knowledge of*, to form the word genetics, *the knowledge of or the science of the inheritance of characteristics*. Also, the **root gene-** can be teamed with two **suffixes**, **-tic**, *pertaining to*, and **-ist**, *a specialist*, to form the word geneticist, *pertaining to a specialist in genetics*. There can be more than one **suffix** in a single word.

Using the combining form of **cardi/o**, in the medical specialty of cardiology, a cardiologist will often diagnose a cardiopathy. The **suffix -logy**, which means *study of*; the **suffix -logist**, which means *one who studies* or *a specialist*; and the suffix **-pathy**, which means *disease*, all give different meanings in the sentence “in the specialty of cardiology, a cardiologist will often diagnose a cardiopathy.”

Another example of the use of **suffixes** is in the medical specialty of dermatology, when a dermatologist will often diagnose a case of dermatitis (Table 1.1, Figure 1.1).



**Figure 1.1** Dermatitis due to a latex glove. Dr. P. Marazzi/Science Source

**Table 1.1** Use of Suffixes

Complete Word	Root or Combining Form	Suffix	Meaning of Suffix	Meaning of Word
dermatitis	dermat-	-itis	inflammation	inflammation of the skin
dermatologist	dermat/o-	-logist	one who studies	one who studies the skin, specialist in dermatology
dermatology	dermat/o-	-logy	study of	study of the skin

In *dermatitis*, the **suffix -itis** starts with a vowel, so there is no need for a **combining vowel**, and the **suffix** is attached directly to the **root**.

In a different example of the use of **suffixes**, an orthopedic surgeon operating on a joint can perform an arthroscopy, an arthrodesis, or an arthroplasty, all different operations with different outcomes, as shown in Table 1.2.

**Table 1.2** Different Meanings of Suffixes

Complete Word	Combining Form	Suffix	Meaning of Suffix	Meaning of Word
---------------	----------------	--------	-------------------	-----------------

arthroscopy	<b>arthr/o-</b>	<b>-scopy</b>	<i>visual examination</i>	<i>visual examination of a joint</i>
arthrodesis	<b>arthr/o-</b>	<b>-desis</b>	<i>fixation</i>	<i>fixation of a joint</i>
arthroplasty	<b>arthr/o-</b>	<b>-plasty</b>	<i>surgical repair</i>	<i>repair of a joint</i>

You always need a **combining vowel** before a **suffix** that begins with a consonant (e.g., dermatology, arthro**pl**asty).

### Classification of Suffixes

One strategy to help you understand medical terms is to divide **suffixes** into different types, such as diagnostic, surgical, pathologic, and descriptive or adjectival.

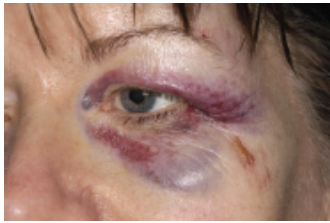
#### Diagnostic Suffixes

This group of **suffixes**, when added to a **root** or **combining form**, produces a medical term that is a diagnosis or a procedure or test to identify the nature of an illness.

The **roots/combining forms hem/o** and **hemat/o** both mean *blood*. Adding diagnostic suffixes can produce a variety of diagnostic medical terms throughout the body systems (*Table 1.3*).

**Table 1.3** Diagnostic Suffixes

Diagnostic Suffix	Meaning of Suffix	Word Example	Meaning of Word Example
<b>-chezia</b>	<i>pass a stool</i>	<b>hemat/ochezia</b>	<i>passage of a bloody stool</i>
<b>-crit</b>	<i>to separate</i>	<b>hemat/ocrit</b>	<i>percentage of red blood cells in the blood</i>
<b>-gram</b>	<i>record</i>	<b>cardi/ogram</b>	<i>record derived from the heart</i>
<b>-graph</b>	<i>instrument for recording</i>	<b>cardi/ograph</b>	<i>instrument for recording the heart</i>
<b>-lysis</b>	<i>destruction</i>	<b>hem/olysis</b>	<i>destruction of red blood cells</i>
<b>-oma</b>	<i>tumor, mass</i>	<b>hematoma</b> ( <i>Figure 1.2</i> )	<i>collection of blood in a tissue</i>
<b>-philia</b>	<i>attraction</i>	<b>hem/ophilia</b>	<i>an inherited blood disease</i>
<b>-ptysis</b>	<i>spit</i>	<b>hem/optysis</b>	<i>to cough up bloody sputum</i>
<b>-rrhage</b>	<i>to flow profusely</i>	<b>hem/orrhage</b>	<i>to bleed profusely</i>
<b>-rrhoid</b>	<i>to flow</i>	<b>hem/orrhoid</b>	<i>painful anal swelling of venous blood</i>
<b>-uria</b>	<i>urine</i>	<b>hematuria</b>	<i>blood in the urine</i>



**Figure 1.2** Hematoma (black eye) following a fall. Dr. P. Marazzi/Science Source

As you go through each body system in the book, there will be additional diagnostic **suffixes** you will learn in relation to the actual diagnoses made at that point in the book.

#### Surgical Suffixes

When added to a **root** or **combining form**, surgical **suffixes** produce medical terms that describe the invasive surgical procedure performed on the body (*Table 1.4*).

**Table 1.4** Surgical Suffixes

Surgical Suffix	Meaning of Suffix	Word Example	Meaning of Surgical Procedure
<b>-centesis</b>	<i>surgical puncture</i>	<b>arthr/ocentesis</b>	<i>surgical puncture of a joint space with a needle</i>
<b>-desis</b>	<i>fixation</i>	<b>arthr/odesis</b>	<i>surgical fixation of the bones of a joint</i>
<b>-ectomy</b>	<i>surgical removal</i>	<b>appendectomy</b>	<i>surgical removal of the appendix</i>
<b>-plasty</b>	<i>surgical repair</i>	<b>rhin/oplasty</b>	<i>surgical repair of the nose</i>
<b>-rrhaphy</b>	<i>surgical suture</i>	<b>herni/orrhaphy</b>	<i>surgical suture of a hernia</i>
<b>-stomy</b>	<i>surgical formation of an opening</i>	<b>trache/ostomy</b>	<i>surgical formation of an artificial opening into the trachea into which a tube is inserted</i>
<b>-tomy</b>	<i>surgical incision</i>	<b>trache/otomy</b>	<i>surgical incision into the trachea</i>
<b>-tripsy</b>	<i>crushing</i>	<b>lith/otripsy</b>	<i>crushing of a stone (calculus), for example, in the ureters</i>

### Pathologic Suffixes

When added to a **root** or **combining form**, this type of **suffix** produces a medical term that describes a symptom or sign of a disease process (*Table 1.5*).

**Table 1.5** Pathologic Suffixes

Pathologic Suffix	Meaning of Suffix	Word Example	Meaning of Pathologic Term
<b>-algia</b>	<i>pain</i>	<b>arthralgia</b>	<i>pain in a joint(s)</i>
<b>-ectasis</b>	<i>dilation</i>	<b>bronchiectasis</b>	<i>chronic dilation of bronchi</i>
<b>-edema</b>	<i>accumulation of fluid in tissues</i>	<b>lymphedema</b>	<i>swelling in tissues as a result of obstruction of lymphatic vessels</i>
<b>-emesis</b>	<i>vomiting</i>	<b>hematemesis</b>	<i>vomiting of blood</i>
<b>-genesis</b>	<i>form, produce</i>	<b>oste/ogenesis</b>	<i>formation of new bone</i>
<b>-itis</b>	<i>inflammation</i>	<b>cystitis</b>	<i>inflammation of the urinary bladder</i>
<b>-oma</b>	<i>tumor, mass</i>	<b>hematoma</b>	<i>mass of blood leaked outside blood vessels into tissues</i>
<b>-osis</b>	<i>abnormal condition</i>	<b>cyanosis</b>	<i>dark blue coloration of blood due to lack of oxygen</i>
<b>-pathy</b>	<i>disease</i>	<b>neur/opathy</b>	<i>any disease of the nervous system</i>
<b>-penia</b>	<i>deficiency, lack of</i>	<b>erythr/openia</b>	<i>decrease in red blood cells</i>
<b>-phobia</b>	<i>fear of</i>	<b>agoraphobia</b>	<i>an unfounded fear of public places that arouses a state of panic</i>
<b>-stenosis</b>	<i>narrowing</i>	<b>arteri/ostenosis</b>	<i>abnormal narrowing of an artery</i>

### Adjectival Suffixes

As you learn new medical terms in each body system chapter in this book, you will see that there are 28 **suffixes** that mean *pertaining to*. These **suffixes** are used as adjectives to describe the **root**. Examples of adjectival **suffixes** are:

- **-ac cardiac** pertaining to the heart
- **-ary pulmonary** pertaining to the lungs
- **-ior posterior** pertaining to the back of the body

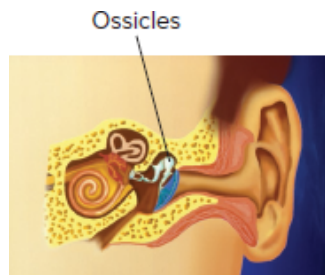
Those 28 **suffixes** are **-ac, -al, -ale, -alis, -ar, -aris, -ary, -atic, -ative, -eal, -ent, -etic, -ial, -ic, -ica, -ical, -ine, -ior, -iosum, -ious, -istic, -ius, -nic, -ous, -tic, -tiz, -tous, -us**.

### Noun Suffixes

Several **suffixes** do not fall under any of the earlier classifications but maintain the **root** or **combining form** as a noun (*Table 1.6*).

**Table 1.6** Noun Suffixes

Noun Suffix	Meaning of Suffix	Word Example	Meaning of Word Example
<b>-iatry</b>	<i>treatment, medical specialty</i>	<b>psychiatry</b>	<i>diagnosis and treatment of mental disorders</i>
<b>-ician</b>	<i>expert, specialist</i>	<b>pediatrician</b>	<i>medical specialist in children's development and disorders</i>
<b>-icle</b>	<i>small, minute</i>	<b>ossicle</b> ( <i>Figure 1.3</i> )	<i>small bone, relating to the three small bones in the middle ear</i>
<b>-ist</b>	<i>expert, specialist</i>	<b>dentist</b>	<i>specialist in disorders of the orofacial complex</i>
<b>-istry</b>	<i>medical specialty</i>	<b>dentistry</b>	<i>specialty in disorders of the orofacial complex</i>
<b>-ole</b>	<i>small, minute</i>	<b>arteriole</b>	<i>small artery</i>
<b>-ule</b>	<i>small, minute</i>	<b>venule</b>	<i>small vein</i>



**Figure 1.3** Ossicles of the middle ear. BSIP SA/Alamy Stock Photo

Note that in *Table 1.6*, three **suffixes** mean “small,” two **suffixes** mean “specialist,” and two **suffixes** mean “medical specialty.”

## Check Point Section 1.2

**A. Building onto the elements of roots, combining vowels, and combining forms are the prefixes and suffixes of medical terminology.** *Prefixes and suffixes are additional word elements that give*

further meaning to a root or combining form. Develop your knowledge of more word elements with the following exercise. Choose T if the statement is true. Choose F if the statement is false. **LO 1.1, 1.2**

- |  |   |   |
|--|---|---|
| 1. In a medical term, the suffix will always appear at the end.  | T | F |
| 2. In the terms <b>arthroscopy</b> and <b>arthrodesis</b> , the combining form is the same, but the suffix is different. | T | F |
| 3. If a suffix begins with a consonant, you will need a combining vowel before it.                                       | T | F |

**B. Identify the meaning of the word by the suffix.** *The medical terms below are commonly used by people who are not necessarily in the medical field. Using what you may already know, identify the meaning of the suffix of medical terms. Match the definition on the left with the correct term it is describing on the right.* **LO 1.2**

- |                          |                         |
|--------------------------|-------------------------|
| 1. _____ a specialist    | <b>a.</b> agoraphobia   |
| 2. _____ afraid of       | <b>b.</b> pneumonectomy |
| 3. _____ study of        | <b>c.</b> dentist       |
| 4. _____ removal of      | <b>d.</b> dermatitis    |
| 5. _____ inflammation of | <b>e.</b> biology       |

## Section 1.3 Prefixes

**Prefixes** can be one letter or a group of letters. **Prefixes** are added directly to the beginning of the term, to the **root** or **combining form** and do not require **combining vowels**. An occasional medical term can have two **prefixes**. **Prefixes** can have more than one meaning. That being said, every medical term will not have a prefix.

For example, you can add the different prefixes **peri-** and **endo-** to the same **root, cardi-**, to produce the different words **pericardium** and **endocardium**, which have very different meanings, as shown in *Table 1.7*.

**Table 1.7** Use of Prefixes

Complete Word	Prefix	Meaning of Prefix	Meaning of Word
pericardium	peri-	around	structure around the heart
endocardium	endo-	inside	structure inside the heart

Note that **-um** is a **suffix** meaning *structure*.

Similarly, **epigastric**, **hypogastric**, and **endogastric** all have the same **root, gastr-**, but because of the different prefixes, **epi-**, **hypo-**, and **endo-**, have very different meanings, as shown in *Table 1.8*.

**Table 1.8** Different Meanings of Prefixes

Complete Word	Prefix	Meaning of Prefix	Meaning of Word
epigastric	epi-	above	pertaining to above the stomach
hypogastric	hypo-	below	pertaining to below the stomach
endogastric	endo-	inside	pertaining to inside the stomach

Note that **-ic** is a **suffix** meaning *pertaining to*.

## Classification of Prefixes

Many **prefixes** can be classified into **prefixes** of position, **prefixes** of number or measurement, and **prefixes** of direction (*Tables 1.9, 1.10, 1.11*).

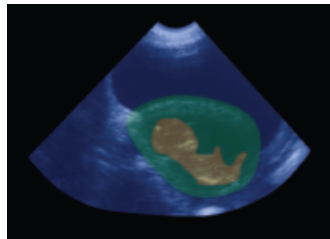
**Table 1.9** Prefixes of Position

Position Prefix	Meaning of Prefix	Word Example	Meaning of Medical Term
ante-	before, forward	antever <b>t</b>	to tilt forward, as a uterus can
anti-	against	antibio <b>t</b> ic	an agent that can destroy bacteria and other microorganisms
circum-	around	circum <b>c</b> ision	to cut around the penis to remove the foreskin
endo-	inside, inner	endo <b>c</b> rine	a gland that secretes directly into the blood
epi-	above, over, upon	epi <b>d</b> ermis	the top layer of the skin
exo-	outside, outward	exo <b>c</b> rine	a gland that excretes outwardly through ducts

<b>hyper-</b>	above, excessive	<b>hypertrophy</b>	increase in size
<b>hypo-</b>	below	<b>hypodermis</b>	tissue layer below the top layer of the skin
<b>inter-</b>	between	<b>intercostal</b>	the space between two ribs
<b>intra-</b>	inside, within	<b>intra</b> dermal (Figure 1.4)	within the skin
<b>para-</b>	adjacent, alongside	<b>paranoid</b>	having delusions of persecution
<b>peri-</b>	around	<b>perinatal</b>	around the time of birth
<b>post-</b>	after	<b>postnatal</b>	after the time of birth
<b>pre-</b>	before	<b>prenatal</b>	before the time of birth
<b>retro-</b>	backward	<b>retrovert</b>	to tilt backward, as a uterus can
<b>supra-</b>	above, excessive	<b>suprapubic</b>	above the pubic bone
<b>trans-</b>	across, through	<b>transdermal</b>	going across or through the skin
<b>ultra-</b>	higher, beyond	<b>ultra</b> sound (Figure 1.5)	very high-frequency sound waves



**Figure 1.4** Intradermal injection. Andrew Aitchison/Contributor/Getty Images



**Figure 1.5** Obstetric ultrasonography of a 22-year-old woman. The 12-week-old fetus is *in brown*. The placenta is *in green*. Warrick G./Science Source

**Table 1.10** Prefixes of Number and Measurement

Measurement Prefix	Meaning of Prefix	Word Example	Meaning of Medical Term
<b>bi-</b>	two, twice, double	<b>bi</b> lateral	pertaining to or related to two sides of the body
<b>brady-</b>	slow	<b>brady</b> cardia	slow heart rate
<b>di-</b>	two	<b>di</b> plegia	paralysis of corresponding parts on both sides of the body
<b>eu-</b>	normal	<b>eu</b> pnea	normal breathing
<b>hemi-</b>	half	<b>hemi</b> paresis	weakness of one side (half) of the body

macro-	large	macrocyte	large red blood cell
micro-	small	microcyte	small red blood cell
mono-	single, one	monocyte	white blood cell with a single nucleus
multi-	many	multiplara	woman who has given birth at least twice
pan-	all	pancytopenia	deficiency of all types of blood cells
poly-	excessive	polyuria	excessive production of urine
primi-	first	primipara	woman who has given birth for the first time
quadri-	four	quadriplegia	paralysis of all four limbs
tachy-	rapid	tachycardia	rapid heart rate
tri-	three	tricuspid	having three points—a tricuspid heart valve has three flaps
uni-	single, one	unipolar	pertaining to one pole; neuron having a single process

**Table 1.11** Prefixes of Direction and Location

Directional Prefix	Meaning of Prefix	Medical Term Example	Meaning of Medical Term
ab-	away from	abduction	action of moving away from the midline
ad-	toward	adduction	action of moving toward the midline
ante-	coming before, in front of	antevert	to tilt forward
post-	coming after, behind	postnatal	occurring after birth
sub-	under, beneath	subdural	in the space under the dura mater
syn-	coming together	synapse	junction between two nerve cells

## Check Point Section 1.3

**A. Review the prefixes and terms in Table 1.9.** Select the correct answer to complete each statement. **LO 1.2**

- The location of the tumor was *above the pubic bone*. The tumor is located \_\_\_\_\_ .
  - hypogastric
  - transdermal
  - suprapubic
  - ultrasonic
- The *transdermal* route of drug administration goes:
  - through the skin.
  - in an IV.
  - through the mouth.
  - in the rectum.

3. *Postpartum* occurs

- a. before delivery.
- b. during delivery.
- c. after delivery.

4. *Retroverted* means

- a. tilted sideways.
- b. tilted forward.
- c. tilted backward.

**B. Answer the following questions regarding the proper use of prefixes.** Choose *T* if the statement is True. Choose *F* if the statement is False. **LO 1.2**

- |   |   |   |
|---|---|---|
| 1. They usually appear in the beginning of a term.  | T | F |
| 2. They can attach to a root or combining form.   | T | F |
| 3. Every term must have a prefix.   | T | F |
| 4. Some terms can have more than one prefix.  | T | F |
| 5. Prefixes can be classified into prefixes of position, number or measurement, or direction. | T | F |

## Section 1.4 Unique Medical Words

### Greek, Latin, and Old English Words

Some medical terms are solid and cannot be broken down into elements. Examples are virus, a Latin word meaning poison, and toxin, a Greek word meaning poison. Though they have the same meaning in their original language, when they are converted to modern medical language, they have very different meanings. These solid words have to be recognized and their meanings memorized.

- **medical**, from a Latin term meaning *to heal*; it means *pertaining to the practice of medicine*.
- **care**, an Old English word meaning *to worry*; when you care for your patients, you look after them and are concerned about them.
- **breath**, an Old English word meaning *a single cycle of inhaling and exhaling*.
- **cough**, an Old English word meaning *to expel breath from the lungs*.
- **mucus**, a Latin word for *a clear, sticky secretion*.
- **record**, a Latin word meaning *to remember*; a medical *record* is a written account of a patient's medical history.
- **patient**, an Old English term meaning *to suffer* or *undergo*; the term refers to a person who is page 10  
under medical or surgical treatment.
- **knee**, an Old English word meaning *an angular shape*; today it refers to the **joint** (a Latin word for junction) between the upper and lower leg.
- **apex**, a Latin word meaning *tip* or *summit* (as in Mount Everest); the apex of the heart is the downward-pointing tip of the cone-shaped heart.
- **patent**, a Latin word meaning *open* or *exposed*; a *patent* blood vessel is open to the circulation of freely flowing blood (Note the difference in the word **patient**).
- **quadrant**, a Latin word meaning *a quarter*; the abdomen is divided into four *quadrants* by horizontal and vertical planes that intersect at the umbilicus.
- **umbilicus**, which is a Latin word for the *navel* or *belly button*.
- **toxin**, a Greek word meaning *poison*; a *toxin* is a poisonous substance formed by a cell, such as a bacterium.
- **lymph**, a Latin word meaning *clear spring water*; *lymph* is a clear, shimmering fluid collected from the body tissues.
- **breech**, an Old English word meaning *buttocks*; in obstetrics, a fetus is in a *breech* presentation when the buttocks, rather than the head, are the presenting part at delivery.
- **specialist**, a Latin word meaning *of a given species*; a *specialist* devotes professional attention to a particular subject area.

### Terms That Are Alike

Precision in both written and verbal communication is essential for a health professional, with great attention given to detail. There are many words in the medical language that are very similar to each other in both their spelling and pronunciation. Examples are:

- **ilium**, pronounced **ill**-ee-um, a bone in the pelvis
- **ileum**, pronounced the same way, **ill**-ee-um, a segment of the small intestine

- **ureter**, the tube from the kidney to the bladder
- **urethra**, the tube from the bladder to the outside
- **trapezius**, a muscle in the back
- **trapezium**, a bone in the wrist
- **malleus**, a small bone in the middle ear
- **malleolus**, a bony protuberance at the ankle
- **neurology**, the study of diseases of the nervous system
- **urology**, the study of diseases of the kidney and bladder

## Check Point Section 1.4

**A. The following medical terms are all of Greek or Latin origin.** Match the definition on the left with the correct term it is describing on the right. **LO 1.3**

- |                                  |                  |
|----------------------------------|------------------|
| _____ 1. tip<br>or summit        | <b>a. patent</b> |
| _____ 2. buttocks                | <b>b. mucus</b>  |
| _____ 3. poison                  | <b>c. apex</b>   |
| _____ 4. clear, sticky secretion | <b>d. breech</b> |
| _____ 5. open                    | <b>e. toxin</b>  |

**B. Choose the correct spelling of medical terms taken directly from Greek, Latin, or Old English words.** **LO 1.3, 1.4**

- A tube from the bladder to the outside.
  - ureethra
  - urethra
  - ureter
  - uretere
- The study of the diseases of the nervous system.
  - urology
  - ureology
  - neurlogy
  - neurology
- A muscle in the back.
  - ilium
  - ileum

- c. trapezius
  - d. trapezium
4. A small bone in the middle ear.
- a. ileum
  - b. ilium
  - c. malleolus
  - d. malleus

## Chapter 1 Review



Nucleus Medical Media

## The Anatomy of Medical Terms

### Challenge Your Knowledge

**A. Identify the statements below as either true or false.** Choose T if the statement is true. Choose F if the statement is false. **LO 1.1**

- |  |     |
|--|-----|
| 1. A term never has more than one root.                | T F |
| 2. Some terms will have no combining vowel.            | T F |
| 3. A combining vowel changes the meaning of the word.  | T F |
| 4. A vowel must always be present in a combining form. | T F |

**B. The root/combining form is the core meaning of the word.** Choose the correct definition for the root/combining form for each term. **LO 1.1**

1. The term *hypogastric* relates to under or below the
- a. chest.
  - b. skin.
  - c. stomach.
  - d. lungs.

2. The term *neuralgia* means pain in a
  - a. nerve.
  - b. joint.
  - c. heart.
  - d. cell.
3. The term *subdermal* means pertaining to below the
  - a. chest.
  - b. skin.
  - c. stomach.
  - d. lungs.
4. The term *cardiac* means pertaining to the
  - a. lungs.
  - b. joints.
  - c. kidneys.
  - d. heart.
5. The term *arthritis* means inflammation of the
  - a. lungs.
  - b. joints.
  - c. kidneys.
  - d. heart.
6. The term *erythrocyte* means cell that is
  - a. large.
  - b. round.
  - c. red.
  - d. swollen.
7. The term *bronchitis* means inflammation of a
  - a. kidney.
  - b. eye.
  - c. bronchus.
  - d. joint.
8. The term *hematology* means the study of
  - a. blood.
  - b. skin.
  - c. the heart.
  - d. the mind.

**C. Match the Greek/Latin elements in the first column with their meanings in the second column. LO 1.1, 1.4**

- |                  |                            |
|------------------|----------------------------|
| _____ 1. pneum   | a. to breathe              |
| _____ 2. hemat   | b. open                    |
| _____ 3. lymph   | c. clear, sticky secretion |
| _____ 4. thorax  | d. tip or summit           |
| _____ 5. arthr   | e. buttocks                |
| _____ 6. respir  | f. chest                   |
| _____ 7. mucus   | g. skin                    |
| _____ 8. patent  | h. joint                   |
| _____ 9. toxin   | i. blood                   |
| _____ 10. apex   | j. air, lung               |
| _____ 11. dermat | k. clear spring water      |
| _____ 12. breech | l. poison                  |

**D. Spelling is most important in medical terminology.** For example, **ilium** and **ileum** may be similar in appearance and sound, but the difference of one letter makes each a different body part. Select the correct spelling for the following terms. **LO 1.3, 1.4**

1. The \_\_\_\_\_ of the small intestine was infected.
  - a. ileum
  - b. ilium
  - c. illium
2. The \_\_\_\_\_ system keeps you breathing.
  - a. respieratory
  - b. respiratory
  - c. resspiratory
3. Inflammation of the heart is \_\_\_\_\_ .
  - a. carditus
  - b. carditis
  - c. cardiitis
4. A muscle in the back is the \_\_\_\_\_ .
  - a. trapeze
  - b. trapezium

c. trapezius

5. A bony protuberance in your ankle is the \_\_\_\_\_.

a. maleus

b. malius

c. malleolus

**E. Use your newly acquired knowledge of medical language to correctly answer the following questions.** Let the roots and combining forms be your guide. Choose the correct answer to complete each statement. **LO 1.1**

1. This term means one who studies the skin.

a. dermatologist

b. urologist

c. neurologist

2. This term relates to the intestines and the stomach.

a. gastroenterology

b. cardiology

c. dermatology

3. This term relates to the process of breathing.

a. apex

b. toxic

c. respiratory

4. This term relates to the stomach.

a. gastritis

b. gynecology

c. dermatitis

5. This term relates to a joint.

a. urethritis

b. arthritis

c. neuralgia

**F. Use the correct medical term to complete the sentence.** Use the words to page 14 complete each sentence below. Fill in the blanks. **LO 1.1, 1.2, 1.3**

**bladder breech cardiologist ileum ilium kidney lymph malleolus trapezium ureter urethra**

1. A \_\_\_\_\_ is a specialist in the care of the heart.

2. The \_\_\_\_\_ is a tube from the kidney to the bladder.

3. Urology is the study of diseases of the \_\_\_\_\_ and \_\_\_\_\_.

4. A segment of the small intestine is the \_\_\_\_\_.

5. \_\_\_\_\_ means the buttocks, not the head, present first at delivery.

6. \_\_\_\_\_ is the tube from the bladder to the outside.
7. \_\_\_\_\_ is a fluid collected from body tissues.
8. A bone in the wrist is the \_\_\_\_\_.
9. The bony protuberance at the ankle is the \_\_\_\_\_.
10. The \_\_\_\_\_ is a bone in the pelvis.

**G. Because much of clinical documentation centers on surgeries, knowledge of surgical suffixes is most important—especially for coders. LO 1.2**

### Matching

Match the definition in the first column with the correct term it is describing in the second column.

Term	Meaning
_____ 1. scopy	A. surgical repair
_____ 2. desis	B. visual examination
_____ 3. plasty	C. surgical fixation

*Combine these suffixes with the combining form arthr/o and fill in the blanks with the correct medical term.*

4. The surgeon wants a closer look inside Mr. Parker's knee so he is scheduled for an \_\_\_\_\_ tomorrow morning.
5. Mary Collins has torn her knee ligaments playing high school basketball. Her treatment plan includes scheduling an \_\_\_\_\_ to reattach them. (fixation)
6. June Larkin had a bad skiing accident while on vacation. Her tendons and ligaments in her knee will require extensive surgery to get her walking again without crutches. She needs an \_\_\_\_\_. (repair)

## Case Reports

**A.** Case Reports demonstrate how medical terminology is used in context. Using the skills of identifying the meaning of the prefix, root/combining form, and suffix will help you learn the meaning of each term. Correctly answer the following questions. **LO 1.1, 1.2**



### Case Report (CR) 1.1

#### You are

... a **respiratory therapist** working with Tavis Senko, MD, a **pulmonologist** at Fulwood Medical Center.

#### You are communicating with

... Mrs. Sandra Schwartz, a 43-year-old woman referred to Dr. Senko by her primary care physician, Dr. Andrew McDonald, an **internist**. Mrs. Schwartz has a persistent abnormality on her chest x-ray. You have