



Analyzing Medical Terms

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LEARNING OUTCOMES

Upon completion of this chapter, you should be able to:

- Discuss the purpose of medical terminology.
- Recognize each of the four word parts of medical terms: prefixes, roots, suffixes, and combining forms.
- Define the commonly used prefixes, roots, and suffixes introduced in this chapter.
- Divide medical terms into word parts.
- Understand how word parts are put together to make medical terms.
- Recognize the importance of proper spelling, pronunciation, and use of medical terms.

INTRODUCTION

There are many ways and various books to help you learn medical terminology. This book is intended for a short course in medical terminology and focuses on medical terms, their definitions, and brief exercises to help you quickly gauge your understanding. That means this book can be worked through in as little as 8 weeks. Our goal is to give you all the basics you will need to be successful in your career, while allowing you to have a little fun learning. Every word in the medical field is not found in this book, but all the Latin and Greek word parts are found here. These word parts can be combined to make thousands of medical terms, and understanding the basic word parts is the first step toward understanding complete words. While it is possible to memorize the definitions of individual medical words, understanding just the parts that make up the medical word is easier and faster than learning every word because there are fewer word parts than complete words. In fact, approached the right way, medical terminology may be the easiest subject in your program. Learning it takes a bit of thought and an open mind; but it need not involve sweating or ripping out your hair in frustration.

Why is medical terminology important? Can't medical professionals just use simple words like "gut" and "cut"? Unfortunately, these aren't always specific enough. Gut can refer to the stomach, small intestine, large intestine, or any part of your digestive system. If you have pain in one of these areas, you would want to be able to easily identify a single area and have all medical professionals recognize that specific area. The term "cut" could mean just an incision, or in other cases it could mean cutting *off* a body part. For example, "She cut her hand" indicates an incision, but "Cut the hand distal to the wrist" could mean an amputation. Luckily medical terminology allows us to specifically identify places in the body and even what type of cut it is with words (see [Figure 1-1](#)).



FIGURE 1-1 This cartoon demonstrates the value of standardized medical terms.

The foundation of medical terminology is rooted in learning the four basic word parts: **prefixes**, **roots**, **suffixes**, and **combining forms**. You'll learn how to distinguish among these word parts in order to combine them into meaningful medical terms.

First, let's examine some medical term characteristics. Most medical terms are derived from Latin and Greek languages. While this may make them seem "foreign," 75% of *all English words* are derived from Latin and Greek. When you look up a term in the dictionary, its **etymology**, or word origin, is usually given along with its definition. For example, *dementia* is an impairment of cognitive function marked by memory loss. It comes from the Latin word, *demens*, which means "out of one's mind."

ACQUIRING AND USING LANGUAGE SENSE

Accurate communication in any specialty field depends on *language sense*. **Language sense** is knowing what words mean and forecasting the effects their combinations will produce. This is a two-part definition. First, we have to understand what the word we're using means. Second, we have to trust that the person listening to what we're saying also understands the meaning of the words that we're using. While this is important in everyday language, it is especially important with medical terminology where misunderstanding can have drastic effects on patients.

Who decides what the "correct" anatomic term is? A system of anatomic naming known as *Terminologia Anatomica* is considered the international standard for terminology that deals with human anatomy. It was created by the Federative Committee on Anatomical Terminology and first published in 1998. It is essentially an anatomy dictionary that gives the Latin base of the word along with the accepted English term. It has standardized anatomy-related terminology and is a great resource.

What does language sense have to do with learning medical terms? First, words have parts, and examining those parts forces the learner to see and hear words in a new way. That is, the person becomes conscious of words as words. You'll have to think about each part of the word and then put it all together to understand how the parts make up the whole. Second, the ability to use words well

involves learning the phonetic and grammatical codes that make complex communication possible. This means using proper pronunciation and using medical terminology correctly in a sentence. Medical terminology is probably one of your first exposures to clinical culture. So congratulations! This is your first step toward success in the medical field!

MEDICAL TERM PARTS

Nearly every medical term contains one or more *roots*. It may also contain one or more *prefixes* and one or more *suffixes*. When you start combining parts into words, you will also use a *combining form* of a root. This means a single medical term may consist of one part or several parts, but every part of a term behaves in one of three ways: root, prefix, or suffix. The good—and maybe surprising—news is that these three parts also make up all other English words. The even better news is that as an English speaker, you already know a lot of these parts, especially prefixes and suffixes.

Here is the order of word parts used in forming words: prefixes first, roots second, and suffixes last, assuming a word contains all three parts. If a **prefix** is present, it appears at the beginning of the term. A root is next. The **root** is found in the middle of the word, and they form words by adding prefixes or suffixes to them. **Suffixes** are always the endings of words. A **combining form** is used in combination with another word part that is distinct from a prefix or suffix that adjusts the sense or function of the word.

Some words, such as *nontraditional*, contain all three word parts. The prefix is **non-** (not), the root is **tradition** (established customs or norms), and the suffix **-al** (makes the word an adjective meaning “relating to”). This word is thus an adjective meaning “not relating to customs or norms.”

EXAMPLE: There are movements that encourage women to seek *nontraditional* occupations such as firefighting.

Some words contain only two parts, such as *traditionist*. Tradition is the root and **-ist** is the suffix that refers to “adhering to a system of beliefs or customs.” So, a traditionist is a person with established beliefs or customs.

EXAMPLE: Mr. Brown, who asked that boys in his classroom removed their hats, was considered a traditionist.

Other words contain other combinations, such as *nontraditionalist* (the prefix **non-** = not; the root **tradition** = established customs or norm; the suffix **-al** = adjective form meaning relating to; and another suffix **-ist** = refers to adhering to a system of beliefs or customs). So, a *nontraditionalist* is a person without established beliefs or customs.

EXAMPLE: Mrs. Brown, who didn’t mind boys wearing hats in her classroom, was considered a nontraditionalist.

Here is a medical term that has two roots: psychopath (**psycho** and **path**). *Psychopath* is a medical term that has become a common English word. It refers to a person who has a severe psychological disorder. One might contend that *path* is a suffix because in the term psychopath, it comes last. If we consider that the word part *path* comes to us from the English word **pathos**, which means sorrow, suffering, or tragedy, then maybe we ought to identify it as a root. However, as it comes at the end of some terms, is it not also a suffix? The best answer to that question is, “Who cares?” You may call it a root or a suffix, and it doesn’t really matter as long as you know what it means and where it goes in a particular term. The bottom line is that prefix, root, and suffix identification is a convenient way to look at and decipher terms; and most of the time, assigning the labels of prefix, root, and suffix to a word’s parts leads to an acceptable definition. If the parts vary a little now and then, don’t despair; the universe will go on.

ANALYZING TERMS

Learning to pick out prefixes, roots, and suffixes, as is done for you in [Table 1-1](#), will permit you to define many, or even most, medical terms. Before going any further, we must deal with what has been traditionally referred to as a fourth word part: the **combining form**. A combining form is simply a root that includes one or more vowels tacked onto the end of it to make a root–suffix combination pronounceable, as in the word *psychology*. The main root is *psych* (mind), and the suffix is *-logy* (study of). But “psychlogy” doesn’t flow as well as psychology, thus we insert the “o” to create a more English-sounding word. So, as the example shows, the combining form concept is all about vowels, consonants, and pronunciation. A problem thus arises. That problem is that we remember a word (or a word part, for that matter) in two ways: by recalling the sound it makes when we hear it spoken and by the sound a visual combination of its letters makes when we see it written.

When I asked a colleague how she pronounced the prefix **iatro-**, which means physician, she said, “eye-a-tro.” Another colleague pronounced it, “eye-at-ur,” and a French friend of mine insisted on, “eye-att-re” with a clipped final vowel sound, as in *Louvre*.

This book will introduce roots with their potential combining vowels added with forward slashes (/) separating them from the rest of the root.

EXAMPLE: card/i/o

By the way, it would make equal sense to introduce them as follows:

EXAMPLE: card; cardi; cardio (all three are, phonetically speaking, roots.)

You can learn a great deal from [Table 1-1](#). To begin with, the terms **cardialgia**, **cardiology**, and **carditis** not only show the three forms of the root for heart (**card**, **cardi**, and **cardio**) but also introduce you to three important suffixes: **-algia**, **-logy**, and **-itis**.

- -algia = pain
- -logy = study of
- -itis = inflammation

Term	Prefix	Root	Suffix	Term Meaning
cardialgia		cardi (heart)	-algia (pain)	pain in the heart; also, heartburn (a digestive disorder)
cardiology		cardio (heart)	-logy (study of)	study of the heart and its disorders
carditis		card (heart)	-itis (inflammation)	inflammation of the heart
diagnosis	dia- (across; through)	<i>gnosis</i> (Greek word meaning “knowledge”)		discovery of the cause of signs and symptoms
iatrogenic disease		iatro (physician); gen (origin, cause)	-ic (adjective suffix)	disease caused by health care (whether an individual worker, particular institution, or the system as a whole)
psychopath		psycho (mind); path (disease)		person with a (serious) mental disease

These three suffixes occur in many medical terms. For example, when you learn a new root, such as **neur/o**, which means nerve, you will know the meanings of **neuralgia**, **neurology**, and **neuritis**:

- neuralgia = pain in a nerve
- neurology = the study of the nervous system; also the specialty dealing with diagnosis and treatment of nervous system disorders
- neuritis = inflammation of a nerve



Quick Check

Using your knowledge of prefixes, roots, and suffixes, see if you know which word parts make up a medical word you may not yet know. Intracranial means pertaining to the area within the skull.

Intracranial: prefix = _____ root = _____ suffix = _____

Discerning readers may have noted that the suffix *-logy* is in the same category as the suffix *-path*. Although they both may be regarded as suffixes, we might also note that *-logy* is a root that comes to us from the Greek word *logos*, meaning “word”—not as in “a” word so much as in “the” word, that is, an explanation of things. That final meaning is why we define it as “study of” in **Table 1-1**. You may also recognize this root in common English words such as logic and logical.

In summary, you now know the first part of the definition of every term ending with any of the three suffixes introduced in the table. For *-algia*, the definition will begin with “pain in... .” It is important to note here that a second suffix, *-dynia*, also denotes pain. These two suffixes are sometimes interchangeable and sometimes not. Eventually, you will become familiar with instances in which one or the other is appropriate or at least most common.

For *-logy*, the definition will usually begin with “study of...”

For *-itis*, the definition will begin with “inflammation of...”

The term **diagnosis** introduces the prefix **dia-**, which means through, across, or between. You may have noticed that *dia-* appears in words you already know and use frequently, such as diameter, a straight line running *through* the center point of a circle; diagonal, a straight line running between opposite corners of a rectangle; and dialogue, people speaking words to each other across a space.

The word dialogue provides an example of how words change meaning when speakers or writers misunderstand their origins. This word has also come to refer to a conversation between two people because someone mistakenly interpreted the prefix to be *di*, meaning two, and other writers and speakers followed suit.

The medical term **diagnosis** refers to the determination of the presence of a disease or other disorder *through* consideration of signs, symptoms, and medical test results. That definition might seem to stretch the point of the word “through” until you learn that *gnosis* is the Greek word for knowledge. In other words, diagnosis is a procedure leading to a judgment “through knowledge.” The verb **diagnose** represents a departure in one respect from the etymology of the term diagnosis. As with all back-formed verbs, clarity is easily lost. In this case, fuzziness comes about because “knowledge” (a noun) identifies something we know, whereas declaring (a verb) that we know it is something else entirely.

Iatr/o is a root that means physician, and **gen/o** (from a Greek word *gennao*, meaning the production of something) refers to origin or cause. The addition of **-ic** to *gen* forms **genic**, an adjective suffix meaning “originating from” or “caused by.” Thus, an *iatrogenic disorder* is, literally speaking, “a disorder caused by a physician.” In general use, the term *iatrogenic* refers to a disorder, disease, or ailment caused by any medical treatment or practitioner, such as a side effect from a drug or complications following surgery.

Another form of the root *iatr/o* is **iatr**, which may be coupled with other roots and several suffixes: **y**, **ic**, **ics**, **ist**, and **ician**. Here are examples of words formed from *iatr*, *y*, *ic*, *ist*, and *ician*:

Term	Part	Meaning
psychiatry	psych + iatr + y	specialty dealing with disorders of the mind (in this case the y does not act as an adjective suffix)
psychiatric	psych + iatr + ic	adjective form of psychiatry
psychiatrist	psych + iatr + ist	specialist in psychiatry
geriatrics	ger + iatr + ics	specialty in disorders of the elderly
pediatrician	ped + iatr + ician	specialist in children's disorders

The root *psycho* comes from the Greek word *psyche*, which means soul or mind. The suffixes **-ist** and **-ician** mean practitioner, and the suffixes **-y** and **-ics** mean practice. The final two items in the list introduce two new roots: **ger/o** and **ped/o**, the meanings of which you may deduce from the meanings of the terms **geriatrics** and **pediatrician**. The root *ger/o* (also sometimes **ger/onto**) comes from the Greek word *geron*, which means old man. The root *ped/o* is derived from the Greek word *pais*, which means child.

See [Tables 1-2](#), [1-3](#), and [1-4](#), which list a sampling of roots, suffixes, and prefixes. Study these so you can start building and defining terms.

TABLE 1-2 WORD ROOTS TO BEGIN BUILDING TERMS

Word Root	Meaning
arthr/o	joint
card/i/o	heart
derm/o/ato	skin
gen/o	origin, cause, formation
ger/o/onto	old age
hem/a/ato	blood
iatr/o	physician
muscul/o	muscle
natal	birth; born
neur/o	nerve
os/teo	bone
path/o	disease
ped/ia	child
phren/o	diaphragm, mind
psych/o	mind
skelet/o	skeleton
tend/o, ten/o	tendon

TABLE 1-3 PREFIXES TO BEGIN BUILDING TERMS

Prefix	Meaning
epi-	upon, following, or subsequent to
micro-	small
peri-	around
post-	after
pre-	before

TABLE 1-4 SUFFIXES TO BEGIN BUILDING TERMS

Suffix	Meaning
-al	adjective suffix
-algia	pain
-dynia	pain
-gen, -genesis	origin, cause, formation
-ic	adjective suffix denoting of
-itis	inflammation
-logy	study of
-pathy	disease
-scope	viewing, an instrument used for viewing

END-OF-CHAPTER EXERCISES

EXERCISE 1-1 DEFINING TERMS

Combine the suffix *-logy* with the proper root to indicate the following medical specialties.

1. Specialty dealing with heart disease _____
2. Specialty that deals with the problems of aging and diseases in the elderly _____
3. Specialty dealing with blood diseases _____
4. Specialty dealing with skin ailments _____
5. Specialty dealing with nervous system disorders _____
6. Specialty dealing with mental disorders _____

EXERCISE 1-2 ANALYZING TERMS

Analyze the following terms by putting the roots and suffixes in the appropriate columns. Then, write a definition for each term.

TERM	ROOT	SUFFIX	DEFINITION
1. neuropathy	_____	_____	_____
2. psychology	_____	_____	_____
3. pathogenic	_____	_____	_____
4. neuralgia	_____	_____	_____
5. systemic	_____	_____	_____
6. psychiatrist	_____	_____	_____
7. pediatrician	_____	_____	_____
8. iatrogenic	_____	_____	_____
9. cardialgia	_____	_____	_____
10. neuritis	_____	_____	_____

EXERCISE 1-3  **FILL IN THE BLANK**

Fill in the blank with the correct answers.

1. The prefix *peri-* denotes _____.
2. The suffix *-logy* means _____.
3. The word root *derm/o* refers to _____.
4. The medical term *osteoarthritis* contains two _____ and one _____.
5. The suffix *-logy* is derived from the Greek word _____, which means _____.
6. Tendonitis refers to the _____ of a _____.
7. A prenatal examination is one that occurs _____ the birth of a child.
8. _____ is indicated by the suffixes *-algia* and _____.
9. Inflammation is indicated by the suffix _____.
10. The study of mental and emotional disorders is called _____.