Introduction to Medical Terminology/Biochemistry

INTRODUCTION

This study unit will introduce you to the language of medicine as it applies to the human body. You'll learn how to determine the meaning of a medical term based on its composition. You'll also learn about the biochemical needs of the body and how the body functions to maintain itself.

As a medical professional, you'll need to know about the body and its functions. At the root of all this knowledge are words, and so we'll also be teaching you the language you need to function in the field. This study unit will cover the basics—an overview of the body and its functions, and a rundown of basic word parts. It's a good idea to have a firm grasp on these basic word parts because they'll help you in the future when you encounter an unfamiliar term. You'll be able to determine meanings of medical terms, even if you don't have a dictionary on hand!

You'll see many medical terms here that you've never seen before. You probably won't know how to pronounce these terms. For this reason, the phonetic spelling of a new word is given in parentheses after the term. A phonetic spelling spells the word as it actually sounds. We've given the most common pronunciation. The phonetics may be different in some dictionaries. Practice *saying* the word when you read it.

The phonetic spelling for each medical term is presented in the simplest form possible. Use the following guidelines when you read each term out loud:

1. Long vowel sounds are marked with a straight bar over them. Therefore, the phonetic spelling of *hate* is hāt, the phonetic spelling of *bee* is bē, the phonetic spelling of *time* is tīm, and so on.

2. Short vowel sounds are marked with a breve (˘) over them. Therefore, the phonetic spelling of *hat* is hăt, the phonetic spelling of *hen* is hĕn, the phonetic spelling of *hit* is hĭt, and so on.

3. Primary (′) and secondary (″) accents are marked as such. The primary accent is the one that's stressed the most. For example, a common medical term, *dentist,* has two short vowels and is accented on the first part of the word; the phonetic spelling of the word is dĕn′tĭst. The word is pronounced DEN-tist. The phonetic spelling for the word *cardiac* is kar′dē-ăk, and the word is pronounced CAR-di-ac.

There are resources available online that accompany your study unit. Be sure to consult these guides to make sure you're maximizing your learning experience.

The Language of Medicine

The vocabulary of medicine originates from the Greek and Latin languages. Hippocrates was a Greek physician during the fourth century B.C. The Hippocratic Oath, named in his honor, is taken by physicians before they begin their medical practice. He's often called the "Father of Medicine," and we've inherited much of our medical language from him.

Sometimes the English language uses both Greek *and* Latin forms to create a medical term. Often our words for body organs come from Latin, yet the diseases and procedures that affect these organs come from Greek. For instance, the Latin-based word *uterus* (ū′ter-ŭs) refers to a female reproductive organ, yet we call the removal of this organ a *hysterectomy* (hĭs″tĕ-rĕk′tō-mē), from *hyster,* Greek for

"womb." From yet another Greek word for uterus, *metra,* we get the word *endometrium* (ĕn-dō-mē′ trē-ŭm) for "the inner lining of the uterus."

New words are always being coined to name medical discoveries, and even they usually have Greek or Latin origins. That's the way of medical language. It should come as no surprise, then, that learning medical terminology is a lot like learning a foreign language.

Learning another language isn't just a matter of memorizing the vocabulary. There's a certain code to any language. Individual words, as well as groups of words, have specific meanings that depend on the order of parts. If you get the order mixed up, you'll change the meaning or make the words meaningless. If you know the meanings of the parts of words and how those parts function in combination with each other, you can figure out almost any word you hear.

These are the component parts—*word elements*—you'll be looking for when analyzing medical terms:

- *Prefix*—a unit of meaning attached to the front of a word. For example, the prefix AB- means "away from," so AB-normal is "*away from* normal."

- *Root*—the core or foundation of the word's meaning. The root of *ab*-NORM-*al* is NORM, meaning "rule, order."

- *Combining vowel*—a vowel (most often *o*) added to the end of the root, without changing the meaning. A combining vowel is placed between two roots, or between a root and a suffix that begins with a consonant, to help make the newly combined word easier to pronounce. If the suffix begins with a vowel, drop the *o.*

- *Combining form*—the root and combining vowel together, as in NORM/O.

- *Suffix*—a unit of meaning attached to the end of the word. The -AL in *abnorm*-AL is a suffix meaning "pertaining to."

We'll be providing you with many word lists to help you memorize the terms you'll need to know as a medical professional. Cover the meanings and examples with a piece of paper, write the definition beside each term, then lift the paper to check your answers.

The best way to study: drill yourself with homemade flash cards of each term and its definition.

Remember, hyphens indicate suffixes and prefixes, and slashes indicate combining forms.

COMMON PREFIXES AND SUFFIXES

Prefix	Meaning
ANTE-	before
ANTI-	against
ECTO-	outside
ENDO-	within
HYPER-	above, beyond, excessive
HYPO-	below, under, deficient
INTER-	between
INTRA-	within
PARA-	beside
PERI-	around
PER-	through
PRE-	before
PRO-	before
SUPER-	above, beyond
SUPRA-	above, beyond

Suffix	Meaning
-POIESIS	formation
-PTOSIS	prolapse, drooping
-PTYSIS	spitting
-RRHAGIA	bursting forth
-RRHAGE	bursting forth
-RRHAPHY	suture
-RRHEA	flow
-RRHEXIS	rupture
-SCOPE	instrument
-SCOPY	to view
-TOME	instrument to cut
-TOMY	incision
-TRIPSY	crushing
-TROPHY	nourishment

SOME FAMILIAR WORD PARTS

Term	Meaning	Example
RADI/O	radiation	radiographer (rā″dē-ŏg′rah-fer) one who takes radiographs, or x-rays
GRAPH	recording instrument	
-ER	one who	
PNEUMON/O	lungs, air	pneumonia (nū-mō′nē-ah) condition of lungs
-IA	condition	
CHEM/O	drug, chemical	chemist (kĕm′ĭst) specialist in chemicals
-IST	specialist	
ARTERI/O	artery	arteriole (ar-tē′rē-ōl″) smaller branch of artery leading into a capillary
-OLE	little, small	
PUSTUL/O	infected blister, pimple	pustule (pŭs′tūl) small abcess of the skin
-ULE	little, small	
PERI-	around	pericardium (pĕr″ĭ-kar′de-ŭm) membrane around the heart
CARDI/O	heart	
-UM, -IUM	structure, tissue	
TACHY-	fast	tachycardia (tăk″ē-kar′dē ah) abnormally fast heartbeat
BRADY-	deficient, under	bradycardia (brăd″ē-kar′dē-ah) abnormally slow heartbeat
ADEN/O	gland	adenoid (ăd′ĕ-noid) resembling a gland; enlarged glandular tissue located in the throat
-OID	resembling	
-S, -ES	plural	adenoids (ăd′ĕ-noidz) more than one adenoid
ADIP/O	fat	adipose (ăd′ĭ-pōs) full of fat
-OSE	full of	

Not every word begins with a prefix or ends with a suffix, so try not to think of the prefix as *the beginning* of a word or the suffix as *the end* of a word. Words can begin or end with roots—and often do.

In this program, we're using capital letters to indicate prefixes, roots, and suffixes. However, medical terms themselves aren't capitalized. (The same rules for capitalizing regular

English vocabulary apply to medical words.) We're also following the common convention of hyphenating prefixes and suffixes when they're not attached to roots. The hyphen after the prefix—or before the suffix—indicates that the term isn't a complete word. Another common practice we're using is showing combining forms with a slash between the root and combining vowel.

AB-   The hyphen shows the prefix must be attached to the beginning of a root to be part of a complete word.

NORM/O   The slash shows the combining *vowel* has been added to the root to make a combining *form.*

-AL   The hyphen shows the suffix must be attached to the end of a root to be part of a complete word.

To get the hang of analyzing word parts, let's begin with a word you already know. Without looking it up in the dictionary, you'd probably define *diagnosis* (dī′′ăg-nō′sĭs) as something like "the process of finding out what's causing a patient's symptoms." Let's call that our plain English translation. And now a more scientific analysis:

Prefix	**Root**	**Suffix**
	+ Combining Vowel	
	= Combining Form	
DIA-	GNOS/O	-SIS
(complete)	(knowledge)	(process)

So we have "complete knowledge process"? That seems backwards, doesn't it, compared to our plain English definition. "Process of complete knowledge" sounds better.

It may seem strange to begin "reading" on the right, since we're trained to begin on the left when reading English, but that's exactly what to do when analyzing a medical term.

The most important rule in analyzing medical terminology is *begin at the end.* Don't put the *meanings* of the parts together in the same order as the *parts themselves* appear in the word, or you can end up with a muddled mess.

To determine the meaning of a term, look at the parts in this order:

1. Suffix

2. Prefix

3. Root(s)

Since the combining vowel doesn't carry a meaning of its own, you don't have to add that into the definition. Thus, the term *diagnosis* does mean "process of complete knowledge." In the case of medicine, the term refers to the complete knowledge resulting from the process of examining and testing of a patient. And *abnormal* means "pertaining to away from the norm." Or, in plain English—about something that isn't right.

Now for a harder example, the word *electroencephalography* (ē-lĕk″trō-ĕn sĕf″ah-lŏg′rah-fē), better known as EEG:

Combining Form	Combining Form	Suffix
ELECTR/O	ENCEPHAL/O	-GRAPHY
(electricity)	(brain)	(process of recording)

(Note from this example that there can be more than one combining form in a medical term. And, remember, a combining form is just the addition of a vowel to a root word, so those first two combining forms are root words—we didn't start with a prefix.)

Thus, we have "the process of recording electricity of the brain." So why wouldn't *encephaloelectrography* be acceptable? That would mean "the process of recording brain electricity," wouldn't it—and isn't that the same thing? Not quite. "Brain electricity" does follow the natural adjective-preceding-noun pattern of English, and our plain English translation might be "the process of recording brain-wave activity." But we can't always plug English word patterns into medical terminology. Therefore, we should define *electroencephalography* as "the process of recording electricity of the brain." This definition emphasizes that it's the electricity, not the brain itself, being measured.