

MEDICAL WORD ELEMENTS

2

Chapter Outline

Word Parts

- Suffixes
- Prefixes
- Combining Forms
- Three Simple Steps

Abbreviations

Pathology Terms

Closer Look

- Suffixes

Practice Exercises

- Prefixes

Practice Exercises

Pronunciation

- Abbreviations and Symbols

End-of-Chapter Practice Exercises

Word Parts

Most medical words derive from Greek or Latin and therefore may look and sound odd to you. However, once you have taken the time to learn the meanings of the word parts, you will be able to understand most of the medical terms you encounter, regardless of how big or complex they appear. There are three types of word parts that you need to know: (1) suffixes, (2) prefixes, and (3) combining forms (created by joining a *word root* to a *combining vowel*). You will use these word parts in a three-step process to find the meanings of medical terms. You also need to know the abbreviations and pathology terms that are used in health care; however, the three-step deciphering process often does not work with these terms.

Flashpoint

Word Root (WR) +
Combining Vowel (CV) =
Combined Form (CF)

Suffixes

A **suffix** is a word part that comes at the end of the medical term. If the suffix **-meter** (instrument used to measure) is added to the combining form therm/o, the result is the creation of the word therm/o/**meter**, an instrument used to measure heat.

Prefixes

A **prefix** is a word part that comes at the beginning of the medical term. For example, again consider the word root therm. If it is joined with the prefix **hypo-** (beneath or below) and the suffix **-ia** (condition), then a new word is created: **hypo**/therm/ia, a condition of low heat. As you may already know, this term is used in reference to a condition of low body temperature.

Combining Forms

The **combining form** is created by joining a **word root** with a **combining vowel**. A word root (WR) is the main stem, or primary meaning, of the word. An example using a nonmedical term is the word *walking*. The main stem or root of this word is *walk*. A combining vowel (CV) is used to make the medical term easier to pronounce. You could say that it makes medical terms more user-friendly for the tongue. A combining vowel is not always necessary. When it is needed, in nearly all cases the combining vowel is an **o**, although there are a few exceptions.

The combining vowel has no impact on the meaning of the term; it is placed between word parts to link them together. For example, consider the root *therm*, which means *heat*. If this word root is combined with the combining vowel *o*, the result is the combining form *therm/o*. Combining vowels are typically used to link word parts together regardless of whether the following part is a suffix or another combining form.

When to Use a Combining Vowel

To determine the need for a combining vowel, notice whether the following word part begins with a consonant or a vowel. If it begins with a consonant, as in the word *therm/o/meter*, then a combining vowel (often *o*) is usually needed. However, if the next word part begins with a vowel (*a, e, i, o, u*), then a combining vowel is usually not needed. This is because the vowel at the beginning of the next word part serves as the combining vowel. For example, when the root *arthr*, which means *joint*, is combined with the suffix *-itis*, which means *inflammation*, no combining vowel is needed. The *i* in *-itis* serves as the combining vowel. The new term *arthr/itis* is created, which means *inflammation of a joint*. This term may already be familiar to you.

The terms we have been using are diagrammed below so that you can clearly see how the word parts fit together, as well as when and why combining vowels are used.

hypo / therm / ia
 ↑ ↑ ↑
 prefix WR suffix
 (suffix starts with vowel:
 no CV needed)

therm / o / meter
 ↑ ↑ ↑
 WR CV suffix
 (suffix starts with consonant:
 CV needed)

arthr / itis
 ↑ ↑
 WR suffix
 (suffix starts with vowel: no CV needed)

Flashpoint

When a term is created by using a combining vowel to link two word parts, the emphasis nearly always shifts to the syllable containing the combining vowel. The vowel, when an *o*, also changes to a short “ah” sound.

Three Simple Steps

There are just three simple steps to follow as you begin deciphering medical terms:

1. Translate the *last* word part first.
2. Translate the *first* word part next.
3. Translate *following* word parts in order.

It's that simple. Here's an example: Consider the term *esophagogastroduodenoscopy*. This term is quite a mouthful and may seem rather intimidating.

However, we will follow the three simple steps described above, and you will see how easy it can be to decipher this word's meaning. You may find it helpful to put slashes between the word parts: esophag/o/gastr/o/duoden/o/scopy. After practicing these steps a few times, you won't need to do this anymore.

Step 1

-Scopy is a **suffix** that means visual examination.

Step 2

Esophag/o is a **combining form** that means esophagus.

Step 3

Gastr/o is a **combining form** that means stomach.

Duoden/o is a **combining form** that means duodenum, which is the first part of the small intestine.

Now put it all together. The final translation of esophagogastroduodenoscopy: visual examination of the esophagus, stomach, and duodenum, also known as an upper endoscopy.



Learning Style Tip

Reading the terms aloud helps verbal and auditory learners. If you are a verbal learner, you need to say them. If you are an auditory learner, you need to hear them, even if it is in your own voice.

Flashpoint

It may help you to remember the order in which to complete these steps if you consider the order in which you write your name on most legal forms: last, first, middle.

Abbreviations

Abbreviations save time and simplify the speaking, reading, and writing of medical terms. They are used extensively in health care because there are so many terms that are lengthy and difficult to pronounce. **EGD** is the abbreviation for the large term you just learned, *esophagogastroduodenoscopy*. Many abbreviations are **acronyms**, abbreviations formed by using the first letter of each word. An example of this type of abbreviation is **CAD**, which stands for *coronary artery disease*. Some abbreviations do not even contain letters found in the medical term. For example, **c̄** is the abbreviation for the word *with*. **Symbols** are also used to save time and space when **documenting**, or writing in the patient's chart, and in written communication with other medical professionals. An example of a symbol is ↑, which means *upward* or *increase*. As you continue through this book, you will notice that each chapter contains a table of abbreviations that pertain to the body system you are studying. See Table 2-14 on page 40 for abbreviations and symbols that do not pertain to a particular body system but do have an important role in documentation and written communication with other medical professionals.

It is very important that you use only abbreviations that are commonly recognized and have been approved by the facility in which you work. Making up your own abbreviations or using ones not recognized by your facility can lead to communication errors and can potentially jeopardize patient well-being. For example, some people may interpret the abbreviation **hs** to mean *half strength* while others interpret it as *at bedtime*. The Joint Commission (formerly the Joint Commission on Accreditation of Healthcare Organizations or JCAHO) has developed a "Do Not Use" list of abbreviations to help ensure patient safety.

Flashpoint

The Joint Commission provides accreditation and certification to more than 20,000 health-care organizations in the United States. Their standards and initiatives have been developed to ensure the highest quality and safety in patient care. For more information, go to www.jointcommission.org

Pathology Terms

Pathology terms are used extensively in health care; they refer to diseases and disorders of all body systems. An example is **multiple sclerosis**, a chronic disease in which nerves lose the ability to transmit messages to the muscles. Students sometimes struggle with these terms because the three-step deciphering process that you just learned often does not work with these terms. Learning and remembering pathology terms requires study and memorization. However, this book includes some helpful tips to assist you with this process. Many of the pathology terms have pictures that accompany the definition and the terms are included in the learning exercises in each chapter. There are also flash cards for the pathology terms from each chapter on the *DavisPlus* website.

Closer Look

Let's take a closer look at the concepts mentioned previously.



Learning Style Tip

Study with a partner so you can take turns quizzing each other. Verbalizing terms and definitions helps verbal learners; listening to each other helps auditory learners.

Suffixes

Flashpoint

Suffixes always change the meaning of the term.

Suffixes are word parts that appear at the ends of words and modify the meaning in some way. Consider the combining form **appendic/o**, which means *appendix*. If the suffix **-itis** (*inflammation*) is added, the term *appendic/itis* is created. As you may already know, this term means *inflammation of the appendix*.

This chapter introduces you to a large number of suffixes. They have been grouped according to several general categories. Note that the suffixes are usually arranged in alphabetical order; however, where there are two or more suffixes with the same or similar meanings, they are grouped together. This will make them easier for you to learn. Don't worry about word building yet. Just focus on learning and memorizing these suffixes. To help you with this process, study the suffix tables using the following steps:

1. Read the suffix in the first column.
2. Practice pronouncing the suffix correctly by using the guide in the second column.
3. Read the meaning aloud in the third column.
4. Write the suffix in the fourth column as you again pronounce it aloud.

Table 2-1 shows suffixes that indicate medical specialty, and Table 2-2 contains suffixes that indicate surgeries, procedures, or treatments. Note that these suffixes will be reviewed again throughout the following chapters.

TABLE 2-1

SUFFIXES THAT INDICATE MEDICAL SPECIALTY

Suffix	Pronunciation Guide	Meaning	Write the Suffix
-iatrics, -iatry	ī-ă-trīks, ī-ă-trē	field of medicine	
-iatrist, -ician, -ist	ī-ă-trīst, ī-shŭn, ĭst	specialist	
-logist, -ologist	lō-jĭst, ōl-ō-jĭst	specialist in the study of	
-logy, -ology	lō-jē, ōl-ō-jē	study of	

TABLE 2-2

SUFFIXES THAT INDICATE SURGERIES, PROCEDURES, OR TREATMENTS

Suffix	Pronunciation Guide	Meaning	Write the Suffix
-centesis	sĕn-tĕ-sĭs	surgical puncture	
-cidal, -cide	sĭ-dĕl, sĭd	destroying, killing	
-desis	dĕ-sĭs	surgical fixation of bone or joint, binding, tying together	
-dilation	dĭ-lĕ-shŭn	widening, stretching, expanding	
-ectomy	ĕk-tō-mĕ	excision, surgical removal	
-graphy	grĕ-fĕ	process of recording	
-metry	mĕ-trĕ	measurement	
-pexy	pĕk-sĕ	surgical fixation	
-plasty	plĕs-tĕ	surgical repair	
-rrhaphy	rĕ-fĕ	suture, suturing	
-scopy	skō-pĕ	visual examination	
-therapy	thĕr-ĕ-pĕ	treatment	
-tomy	tō-mĕ	cutting into, incision	
-tripsy	trĭp-sĕ	crushing	

Practice Exercises

Fill in the Blanks

Choose the term that matches the description. Each term may be used more than once.

Exercise 1

Suffix
Word root

Prefix
Combining vowel

Combining form
Abbreviations

Pathology terms Documenting	Acronyms	Symbols
1. _____	Used to make the medical term easier to pronounce	
2. _____	Unrecognized and unapproved use of these may jeopardize patient well-being	
3. _____	A word part that comes at the end of the medical term	
4. _____	Writing in the patient's chart	
5. _____	Created by joining a word root with a combining vowel	
6. _____	Letters used to save time and simplify the speaking, reading, and writing of medical terms	
7. _____	Abbreviations formed by using the first letter of each word	
8. _____	Does not include a prefix, suffix, or combining vowel	
9. _____	Is not used if the next word part begins with a vowel	
10. _____	A word part that comes at the beginning of the medical term	
11. _____	The main stem, or primary meaning, of the word	
12. _____	Nonletters used to save time and space in documentation and communication with other health-care professionals	
13. _____	Refer to diseases and disorders of all body systems	
14. _____	When deciphering medical terms, translate this word part first	
15. _____	The three-step deciphering process often does not work with these	

Fill in the Blanks

Fill in the blanks using suffixes from Tables 2-1 and 2-2.

Exercise 2

1. Suffixes that mean *field of medicine* are _____ and _____.
2. Suffixes that mean *specialist in the study of* are _____ and _____.
3. The suffix that means *surgical repair* is _____.
4. Suffixes that mean *destroying or killing* are _____ and _____.
5. The suffix that means *process of recording* is _____.
6. The suffixes *-logy* and *-ology* mean _____.
7. The suffix *-desis* means _____.
8. The suffix *-ectomy* means _____.
9. The suffix *-metry* means _____.
10. The suffix *-scopy* means _____.

True or False

Decide whether the following statements are true or false.

Exercise 3

1. True False The suffix *-graphy* means *measurement*.
2. True False The suffix *-dilation* means *widening, stretching, or expanding*.
3. True False The suffix *-plasty* means *surgical repair*.
4. True False The suffix *-therapy* means *treatment*.
5. True False The suffix *-ician* means *technician*.
6. True False The suffix *-pexy* means *pain*.
7. True False The suffix *-rrhaphy* means *suture or suturing*.

8. True False The suffix *-tomy* means *cutting into* or *incision*.
9. True False The suffix *-tripsy* means *treatment*.
10. True False The suffix *-centesis* means *centimeter*.

The SOAP Note

When documenting information in a patient's chart, or medical record, medical professionals often use the SOAP note format. Information is categorized as subjective and objective data followed by an assessment of the data and a plan for future care.

Subjective (S): data include what the patient said. This section includes the patient's chief complaint as well as statements regarding any changes in their condition since their last visit. It is not observable or measurable information. Statements in this section often begin with, "Patient states," "Patient reports," or "Patient complains of." Here are some examples of subjective information:

- S:** Patient complains of pain at right lateral ankle and notes she is unable to put any weight on right foot.
- S:** Patient reports pain and swelling in right ankle is improving.
- S:** Patient states pain in her right ankle is "much better."

In contrast, **objective (O):** data include information that can be observed, measured, or quantified in some way. Examples of objective information are a patient's temperature, blood pressure, or pain level. If the patient has a wound, the location, size, depth, and amount of drainage would be entered into the objective portion of the SOAP note. The objective section also includes all treatments provided by the medical professional. In addition, anything the patient did during the visit, such as exercises, is considered objective data. Here are some examples of objective information:

- O:** Pain at right ankle 8/10. Noted redness, heat, and swelling. Instructed patient in RICE protocol.
- O:** Volumetric measurement right ankle 600 mL
- O:** Patient walked on treadmill for 30 minutes with an increase in speed to 2.5 and a 10% incline.

The **assessment (A):** section of the SOAP note is where the medical professional synthesizes the subjective and objective information. This section can include expectations, or treatment goals, as well as how the patient is reacting to the current treatment and whether he or she is or is not making progress toward the treatment goals. In one of the previous examples, a patient complained of pain at the right ankle and inability to walk on the right foot. In the observation portion of the SOAP note, the medical professional wrote the signs of inflammation that were observed and the instructions given to the patient to help relieve the pain and swelling. In the assessment portion of this SOAP note, the medical professional may write an expectation for "decreased pain and swelling within 1 week." On subsequent visits, assessment statements may include, "right ankle swelling has decreased since last visit" and "patient able to tolerate increased speed and incline on treadmill with no complaints of increased ankle pain."

The **plan (P):** section of the SOAP note is where you write what you will *do* to help the patient make progress toward the treatment goals. This part includes statements about continuing with the current treatment or making changes to the treatment. It also includes recommendations for consultation or

collaboration with other medical professionals. “Continue as per plan of care” and “will contact orthotist regarding ankle brace adjustment” are examples of statements that belong in the plan section of the SOAP note. Most facilities provide guidelines regarding the specific information they want included in the medical record as well as how they want it documented.

Suffixes That Indicate Sensation, Feeling, Action, or Movement

Table 2-3 includes suffixes that indicate sensory experience, sensation, or subjective feeling. Table 2-4 includes suffixes that indicate action or movement.

Flashpoint

An easy way to remember the difference between subjective and objective is that *subjective* data are based on what the patient *said*. *Objective* data are based on what you *observed* or measured.

TABLE 2-3

SUFFIXES THAT INDICATE SENSORY EXPERIENCE, SENSATION, OR SUBJECTIVE FEELING

Suffix	Pronunciation Guide	Meaning	Write the Suffix
-acusia, -acusic, -cusic	ă-koo-zē-ă, ă-koo-s'is, koo-s'is	hearing	
-algisia, -algesic, -algia, -dynia	ăl-jē-zē-ă, ăl-jē-z'ik, ăl-jē-ă, d'ī-nē-ă	pain	
-dipsia	d'ip-sē-ă	thirst	
-esthesia	ēs-thē-zē-ă	sensation	
-opia, -opsia, -opsis, -opsy	ō-pē-ă, ōp-sē-ă, ōp-s'is, ōp-sē	vision, view of	
-osmia	ōz-mē-ă	smell, odor	
-phobia	fō-bē-ă	fear	
-phoria	fō-rē-ă	feeling	

TABLE 2-4

SUFFIXES THAT INDICATE ACTION OR MOVEMENT

Suffix	Pronunciation Guide	Meaning	Write the Suffix
-clasis, -clast	klās-īs, klāst	to break	
-ectasis	ĕk-tā-s'is	dilation, expansion	
-emesis	ēm-ēs-s'is	vomiting	
-gen, -genesis, -genic, -genous	jĕn, jĕn-ēs-s'is, jĕn-ĭk, jĕn-ŭs	creating, producing	
-kinesia, -kinesis	kĭ-nē-zē-ă, kĭ-nē-s'is	movement	
-lysis	lĭ-s'is	destruction	
-pause, -stasis	pawz, stā-s'is	cessation, stopping	
-phage, -phagia	fāj, fā-jē-ă	eating, swallowing	
-phasia	fā-zē-ă	speech	
-rrhage, -rrhagia	rĭj, ră-jē-ă	bursting forth	
-rrhea	rē-ă	flow, discharge	
-rrhexis	rĕk-s'is	rupture	
-spasm	spă-zŭm	sudden involuntary contraction	
-uresis	ŭ-rē-s'is	urination	

Some refer to conscious actions and individual tasks, such as speech (*-phasia*) and movement (*-kinesia*). Others indicate unconscious action within the body, such as a sudden involuntary contraction (*-spasm*). Note that many of these suffixes will be reviewed again in the chapters that follow.



Learning Style Tip

Kinesthetic learners need to move. So imagine you are playing charades—or gather a group to actually play the game—and challenge yourself to act out each of the terms as you study them.

Practice Exercises

Fill in the Blanks

Fill in the blanks below using suffixes from Tables 2-3 and 2-4.

Exercise 4

1. Suffixes that mean *hearing* are _____, _____, and _____.
2. Suffixes that mean *vision* or *view of* are _____, _____, and _____.
3. The suffix that means *feeling* is _____.
4. The suffix that means *smell* or *odor* is _____.
5. Suffixes that mean *creating* or *producing* are _____, _____, and _____.
6. Suffixes that mean *bursting forth* are _____ and _____.
7. Suffixes that mean *eating* or *swallowing* are _____ and _____.
8. The suffix that means *vomiting* is _____.
9. The suffix that means *destruction* is _____.
10. The suffix that means *rupture* is _____.

True or False

Decide whether the following statements are true or false.

Exercise 5

1. True False The suffixes *-acusia*, *-acuisis*, and *-cusis* mean *pain*.
2. True False The suffix *-dipsia* means *feeling*.
3. True False The suffixes *-opia*, *-opsia*, *-opsis*, and *-opsy* mean *vision* or *view of*.
4. True False The suffix *-osmia* means *sound*.
5. True False The suffix *-esthesia* means *sensation*.
6. True False The suffixes *-algesia*, *-algesic*, *-algia*, and *-dynia* mean *pain*.
7. True False The suffix *-phobia* means *fear*.
8. True False The suffixes *-clast* and *-clasis* mean *cessation*.
9. True False The suffix *-pause* means *relaxation*.
10. True False The suffix *-phasia* means *eating or swallowing*.

Suffixes That Indicate Diseases, Disorders, or Conditions

Many suffixes in the medical language indicate diseases, disorders, or conditions; these are listed in Table 2-5. Some terms, such as *-derma* (*skin*), *-emia* (*a condition of the blood*), and *-thorax* (*chest*), provide specific clues about the body part involved. Other terms, such as *-constriction* (*narrowing*), *-edema* (*swelling*), and *-itis* (*inflammation*), provide clues about the nature of the disease or disorder. Note that many of these suffixes will be reviewed again throughout the chapters that follow.

Flashpoint

Many suffixes provide clues about the nature or location of the disorder.

TABLE 2-5

SUFFIXES THAT INDICATE DISEASES, DISORDERS, OR CONDITIONS

Suffix	Pronunciation Guide	Meaning	Write the Suffix
-cele	sĕl	hernia	
-constriction	kŏn-strĭk-shŭn	narrowing	
-cytosis	sĭ-tŏ-sĭs	a condition of cells	
-derma	dĕr-mă	skin	
-edema	ĕ-dĕ-mă	swelling	
-emia	ĕ-mĕ-ă	a condition of the blood	
-gravida	gră-vĭ-dă	pregnant woman	
-ia, -ism	ĕ-ă, ĭz-ŭm	condition	

Continued

TABLE 2-5**SUFFIXES THAT INDICATE DISEASES, DISORDERS, OR CONDITIONS—cont'd**

Suffix	Pronunciation Guide	Meaning	Write the Suffix
-iasis	ī-ă-s'is	pathological condition or state	
-itis	ī-t'is	inflammation	
-lepsy, -leptic	lěp-sē, lěp-t'ik	seizure	
-lith	l'ith	stone	
-malacia	mă-lă-sē-ă	softening	
-megaly	měg-ă-lē	enlargement	
-necrosis	ně-krō-s'is	tissue death	
-oid	oyd	resembling	
-oma	ō-mă	tumor	
-osis	ō-s'is	abnormal condition	
-oxia	ők-sē-ă	oxygen	
-paresis	pă-rē-s'is	slight or partial paralysis	
-partum, -tocia	părt-ŭm, tō-sē-ă	childbirth, labor	
-pathy	pă-thē	disease	
-penia	PĒ-nē-ă	deficiency	
-pepsia	pěp-sē-ă	digestion	
-phonia	fō-nē-ă	voice	
-plasia, -plasm	plă-zē-ă, plăz-ŭm	formation, growth	
-plastic	plăs-t'ik	pertaining to formation or growth	
-plegia	plē-jē-ă	paralysis	
-plegic	plē-j'ik	pertaining to paralysis	
-pnea	nē-ă	breathing	
-pneic	nē-ik	pertaining to breathing	
-ptosis	tō-s'is	drooping, prolapse	
-salpinx	săl-p'inks	uterine (fallopian) tube	
-sclerosis	sklē-rō-s'is	hardening	
-static	stă-t'ik	not in motion, at rest	
-stenosis	stě-nō-s'is	narrowing, stricture	
-thorax	thōr-ăks	chest	
-trophy	trō-fē	nourishment, growth	
-uria	ū-rē-ă	urine	

Practice Exercises

Fill in the Blanks

Fill in the blanks below using suffixes from Table 2-5.

Exercise 6

1. The suffix that means *pregnant woman* is _____.
2. The suffix that means *stone* is _____.
3. Suffixes that mean *seizure* are _____ and _____.
4. The suffix that means *hernia* is _____.
5. The suffix that means *softening* is _____.
6. The suffix that means *voice* is _____.
7. The suffix that means *not in motion* or *at rest* is _____.
8. The suffix that means *narrowing* or *stricture* is _____.
9. The suffix that means *tumor* is _____.
10. The suffix that means *resembling* is _____.

True or False

Decide whether the following statements are true or false.

Exercise 7

1. True False The suffix *-lith* means *little*.
2. True False The suffixes *-ia* and *-ism* mean *condition*.
3. True False The suffix *-derma* means *down*.
4. True False The suffix *-megaly* means *motion*.
5. True False The suffix *-necrosis* means *tissue death*.
6. True False The suffixes *-partum* and *-tocia* mean *person*.
7. True False The suffix *-osis* means *oxygen*.
8. True False The suffix *-trophy* means *nourishment* or *growth*.

9. True False The suffix *-thorax* means *chest*.

10. True False The suffix *-rrhea* means *flow or discharge*.

Other Suffixes

There are literally thousands of medical instruments used for countless procedures and treatments. Many are categorized according to their general purpose. Cutting instruments go by various names, many ending with the suffix *-tome*. Recording instruments also have many different names; however, many of them end with the suffix *-graph*. Many instruments used for measurement end with the suffix *-meter*, and many of those used for viewing various parts of the body end with the suffix *-scope*. These terms are listed in Table 2-6. Another group of commonly used suffixes all mean *pertaining to* (Table 2-7). Still other suffixes not easily categorized are listed in Table 2-8. Table 2-9 lists the rules for changing the endings of some terms from the singular to the plural form.

Flashpoint

The suffixes of many instrument names provide clues about their purpose or function.

TABLE 2-6

SUFFIXES THAT INDICATE INSTRUMENTS

Suffix	Pronunciation Guide	Meaning	Write the Suffix
-graph	grăf	recording instrument	
-meter	mě-těr	measuring instrument	
-scope	skōp	viewing instrument	
-tome	tōm	cutting instrument	

TABLE 2-7

SUFFIXES THAT MEAN “PERTAINING TO”

Suffix	Pronunciation Guide	Meaning	Write the Suffix
-ac, -al, -ar, -ary, -eal,	ăk, ăl, ăr, ăr-ē, ē-ăl, ē-ăl,	pertaining to	
-ial, -ic, -ical, -ory, -ous,	ĭk, ĭ-kăl, ō-rē, ūs, tĭk, tūs		
-tic*, -tous*			

*-tic, a variation of -ic, is sometimes used; -tous, a variation of -ous, is sometimes used.

TABLE 2-8

OTHER SUFFIXES

Suffix	Pronunciation Guide	Meaning	Write the Suffix
-cyte, -cytic	s ĭt, s ĭt-ĭk	cell	
-gram	grăm	record	
-ole, -ule	ōl, ūl	small	
-prandial	prăn-dē-ăl	meal	
-stomy	stō-mē	mouthlike opening	

TABLE 2-9

PLURAL ENDINGS

Singular Form	Plural Form	Rule	Singular Example	Plural Example
-a	-ae	retain -a and add -e	vertebra	vertebrae
-ax	-aces	drop -x and add -ces	thorax	thoraces
-is	-es	drop -is and add -es	diagnosis	diagnoses
-ix, -ex	-ices	drop -ix or -ex and add -ices	appendix	appendices
-um	-a	drop -um and add -a	diverticulum	diverticula
-us	-i	drop -us and add -i	thrombus	thrombi
-y	-ies	drop -y and add -ies	ovary	ovaries

Practice Exercises

Fill in the Blanks

Fill in the blanks below using Tables 2-6 through 2-9.

Exercise 8

1. The suffix that means *recording instrument* is _____.
2. The suffix that means *cutting instrument* is _____.
3. The suffix that means *measuring instrument* is _____.
4. The suffix that means *viewing instrument* is _____.
5. Suffixes that mean *cell* are _____ and _____.
6. The suffix that means *meal* is _____.
7. Suffixes that mean *small* are _____ and _____.
8. The suffix that means *mouthlike opening* is _____.
9. The suffix that means *deficiency* is _____.
10. The suffix that means *record* is _____.

True or False

Decide whether the following statements are true or false.

Exercise 9

1. True False The suffixes *-al*, *-ial*, *-tic*, and *-tous* mean *pertaining to*.
2. True False The suffixes *-ole* and *-ule* mean *pertaining to*.
3. True False The suffixes *-cyte* and *-cytic* mean *small*.
4. True False The plural form of the word *appendix* is *appendixes*.
5. True False The plural form of the word *diagnosis* is *diagnoses*.
6. True False The suffixes *-ac*, *-ar*, *-ory*, and *-ous* mean *pertaining to*.
7. True False The plural form of the word *thrombus* is *thrombuses*.
8. True False The suffixes *-y*, *-um*, and *-ex* mean *pertaining to*.
9. True False The suffixes *-ary*, *-ical*, *-ic*, and *-eal* mean *pertaining to*.
10. True False The plural form of the word *diverticulum* is *diverticula*.

IN A FLASH!

Remove the Suffix Flash Cards from the back of this book and run through them at least three times before you continue.

Prefixes

Prefixes are always located at the beginnings of words, and they always modify the meaning of the word in some way. As an example, let's take another look at the word *hypothermia*. The prefix **hypo-** means *beneath* or *below*. Therefore, this term indicates *a condition of heat that is below normal*. A common cause of hypothermia is exposure to cold weather without adequate clothing.

Now let's see what happens when we change the prefix to **hyper-**, which means *excessive* or *above*. The newly created word, *hyperthermia*, means *a condition of excessive heat*. This term refers to high body temperature. As you can see, changing the prefix can drastically change the meaning of the term. Hyperthermia might refer to a fever caused by an illness such as the flu. Another example of hyperthermia is heatstroke, a life-threatening condition caused when a person becomes too hot and dehydrated. This typically occurs when a person is exposed to a hot, humid environment and does not use adequate cooling measures.

This chapter introduces you to a large number of prefixes. They have been grouped according to several general categories. Table 2-10 includes prefixes

Flashpoint

Prefixes always change the meaning of the term.

TABLE 2-10

PREFIXES THAT INDICATE SIZE, QUANTITY, OR NUMBER

Prefix	Pronunciation Guide	Meaning	Write the Prefix
a-, an-, in-	ā, ān, ĩn	without, not, absence of	
ambi-	ām-bē	both, both sides, around, about	
bi-	bī	two	
di-	dī	twice, two, double	
hemi-, semi-	hēm-ē, sēm-ē	half	
iso-	ī-sō	same, equal	
macro-	mā-krō	large	
micro-	mī-krō	small	
mono-, uni-	mō-nō, ū-nī	one, single	
multi-	mūl-tē	many	
poly-	pō-lē	much	
oligo-	ō-lī-gō	deficiency	
pan-	pān	all	
quadri-, tetra-	kvō-drī, tē-trā	four	
tri-	trī	three	

that indicate size, quantity, or number. In some cases, the term is quite specific. For example, the prefix *tri-* means *three*, and the prefixes *quadri-* and *tetra-* mean *four*. In other cases, the terms are less specific and refer to general amounts. Examples are the terms *multi-*, which means *many*, and *poly-*, which means *much*. Other terms such as *a-* and *an-* indicate the absence of something. The term *anuria*, for example, indicates *absence of urine*, and the term *anacusia* indicates *absence of hearing*. To begin familiarizing yourself with these prefixes, read through the following tables and answer the questions in the practice exercises that follow them. Note that the prefixes are generally arranged in alphabetical order; however, where there are two or more terms with the same or very similar meanings, they are grouped together. This will make them easier for you to learn. Don't worry about word building yet. Just focus on learning and memorizing these prefixes. To help you with this process, study these tables using the following steps:

1. Read the prefix in the first column.
2. Practice pronouncing the prefix correctly by using the guide in the second column.
3. Read the meaning aloud in the third column.
4. Write the prefix in the fourth column as you again pronounce it aloud.

Note that most of these prefixes will be reviewed again throughout the chapters.



Learning Style Tip

Make a recording of your voice saying the terms and their definitions. Record a term and then pause for a count of three before you record the definition. As you listen to the recording, the pause will allow you to try to say the correct definition aloud before you hear it. This is a great self-quiz too!

Practice Exercises

Fill in the Blanks

Fill in the blanks below using prefixes from Table 2-10.

Exercise 10

1. Prefixes that mean *one* are _____ and _____.
2. The prefix that means *deficiency* is _____.
3. The prefix that means *small* is _____.
4. Prefixes that mean *without, not, or absence of* are _____, _____, and _____.
5. Prefixes that mean *four* are _____ and _____.
6. Prefixes that mean *half* are _____ and _____.
7. The prefix that means *both* or *both sides* is _____.
8. The prefix that means *large* is _____.
9. The prefix that means *much* is _____.
10. The prefix that means *same* or *equal* is _____.

True or False

Decide whether the following statements are true or false.

Exercise 11

1. True False The prefix *ambi-* means *half*.
2. True False The prefix *macro-* means *small*.

3. True False The prefix *iso-* means *same* or *equal*.
4. True False The prefix *pan-* means *none* or *zero*.
5. True False The prefix *tri-* means *three*.
6. True False The prefixes *bi-* and *di-* mean *three*.
7. True False The prefix *micro-* means *small*.
8. True False The prefixes *quadri-* and *tetra-* mean *two*.
9. True False The prefix *multi-* means *many*.
10. True False The prefixes *semi-* and *hemi-* mean *half*.



Learning Style Tip

Use the flash cards every day. They were created especially for you! Read both sides, and be sure to note the visual cues on most of them.

Prefixes That Indicate Location, Direction, or Timing

The prefixes in Table 2-11 indicate location, direction, or timing. For example, the prefix *epi-* in *epigastric* indicates a physical location *above* the stomach. The prefix *circum-* in *circumoral* indicates a physical location *around* the mouth. The

TABLE 2-11

PREFIXES THAT INDICATE LOCATION, DIRECTION, OR TIMING

Prefix	Pronunciation Guide	Meaning	Write the Prefix
ab-	āb	away from	
ad-	ād	toward	
anti-	ān-tē	against	
brady-	brā-dē	slow	
con-	kōn	together, with	
contra-	kōn-trā	against, opposite	
circum-	sēr-kūm	around	
dia-, trans-	dī-ā, trānz	through, across	
ec-, ecto-	ĕk, ĕk-tō	out, outside	
en-, end-, endo-, in-, intra-	ĕn, ĕnd, ĕn-dō, ĭn, ĭn-trā	in, within, inner	
epi-	ĕ-pī	above, upon	
eso-	ĕs-ō	inward	
ex-, exo-, extra-	ĕks, ĕk-sō, ĕk-strā	away from, outside, external	
hyper-, super-, supra-	hī-pĕr, soo-pĕr, soo-prā	excessive, above	
hypo-, infra-, sub-	hī-pō, ĭn-frā, sŭb	below, beneath	

Continued

TABLE 2-11

PREFIXES THAT INDICATE LOCATION, DIRECTION, OR TIMING—cont'd

Prefix	Pronunciation Guide	Meaning	Write the Prefix
inter-	ĭn-tĕr	between	
para-, peri-	pă-ră, pĕr-ĭ	beside, near	
post-	pōst	after, following	
pre-	prĕ	before	
pro-	prō	before, forward	
re-, retro-	rĕ, rĕ-trō	behind, back	
tachy-	tăk-ĕ	rapid	
ultra-	ŭl-tră	beyond	

prefixes *brady-* and *tachy-* are commonly used to indicate timing or speed. *Bradykinesia* indicates *slow movement*, and *tachycardia* indicates *rapid heart-beat*. Other terms may indicate direction. For example, the prefix *ab-* in *abduction* indicates movement *away from* the body and the prefix *ad-* in *adduction* indicates movement *toward* the body.

Practice Exercises

Fill in the Blanks

Fill in the blanks below using prefixes from Table 2-11.

Exercise 12

- The prefix that means *beyond* is _____.
- The prefix that means *away from* is _____.
- Prefixes that mean *across* or *through* are _____ and _____.
- Prefixes than mean *in*, *within*, or *inner* are _____, _____, _____, and _____.
- The prefix that means *toward* is _____.

6. The prefix that means *slow* is _____.
7. The prefix that means *above* or *upon* is _____.
8. Prefixes that mean *out* or *outside* are _____ and _____.
9. Prefixes that mean *away from*, *outside*, or *external* are _____, _____, and _____.
10. The prefix that means *around* is _____.

True or False

Decide whether the following statements are true or false.

Exercise 13

1. True False The prefix *anti-* means *against*.
2. True False The prefix *tachy-* means *rapid*.
3. True False The prefixes *re-* and *retro-* mean *behind* or *back*.
4. True False The prefix *epi-* means *below*.
5. True False The prefix *con-* means *together* or *with*.
6. True False The prefix *contra-* means *against* or *opposite*.
7. True False The prefix *eso-* means *outward*.
8. True False The prefixes *hyper-*, *super-*, and *supra-* mean *excessive* or *above*.
9. True False The prefixes *para-* and *peri-* mean *beside* or *near*.
10. True False The prefix *pro-* means *between*.



Learning Style Tip

Physically holding and flipping through flash cards (while reading them, of course) helps kinesthetic and visual learners learn and remember.

Other Prefixes

Table 2-12 includes prefixes that indicate a variety of other meanings.

TABLE 2-12

OTHER PREFIXES

Prefix	Pronunciation Guide	Meaning	Write the Prefix
auto-	aw-tō	self	
dys-	dĭs	bad, painful, difficult	
eu-	ū	good, normal	
mal-	māl	bad, inadequate	
neo-	nē-ō	new	
tox-	tōks	poison, toxin	

Practice Exercises

Fill in the Blanks

Fill in the blanks below using prefixes from Table 2-12.

Exercise 14

1. The prefix that means *poison* is _____.
2. The prefix that means *good* or *normal* is _____.
3. The prefix that means *new* is _____.
4. The prefix than means *bad, painful, or difficult* is _____.
5. The prefix that means *self* is _____.

True or False

Decide whether the following statements are true or false.

Exercise 15

1. True False The prefix *mal-* means *against*.
2. True False The prefix *neo-* means *new*.
3. True False The prefix *tox-* means *try*.
4. True False The prefix *auto-* means *car*.
5. True False The prefix *dys-* means *self*.

IN A FLASH!

Remove the Prefix Flash Cards from the back of this book and run through them at least three times before you continue.

Pronunciation

It often takes a considerable amount of practice before the pronunciation of medical terms comes easily and naturally. It will help if you develop good habits right from the start. Carefully review the pronunciation guidelines in Table 2-13. These guidelines will help you learn correct pronunciation.

Abbreviations and Symbols

Table 2-14 contains abbreviations and symbols regarding information and instructions. They do not pertain to a particular body system but do play an important role in documentation and written communication with other health-care providers. While some of the abbreviations are on “Do Not Use” lists, you need to know all of them as you will still occasionally see them in written documentation. Make sure the abbreviations you use are approved by your facility and, if you see an abbreviation that should not have been used, be sure to clarify the meaning with the person who wrote it.

TABLE 2-13**PRONUNCIATION GUIDE**

Letters	Guidelines	Examples
ae and oe	pronounce only the <i>e</i>	pleurae (PLOO-rē)
-es	when located at the end of a word, may be pronounced as a separate syllable	nares (NĀR-ēz)
g and c	pronounce as <i>j</i> and <i>s</i> before <i>e</i> , <i>i</i> , and <i>y</i>	generic (jĕ-NĒR-ĭk) gelatin (JĒL-ă-tĭn) cycle (SĪ-kĭl) cytology (sĭ-TŌ-lŏ-jĕ)
g and c	pronounce as <i>g</i> and <i>k</i> before other letters	gait (gāt) gastric (GĀS-trĭk) caffeine (kă-FĒN) calcium (KĀL-sē-ŭm)
-i	when located at the end of a word, generally indicates a plural; pronounce as <i>ī</i> or <i>ē</i>	alveoli (ăl-VĒ-ŏ-lĭ) bronchi (BRŌNG-kĭ)
pn-	pronounce only the <i>n</i>	pneumonia (nū-MŌ-nē-ă) pneumatic (nū-MĀT-ĭk)
ps-	pronounce only the <i>s</i>	psoriasis (sŏ-RĪ-ă-sĭs) psychology (sĭ-KŌL-ŏ-jĕ)

TABLE 2-14

ABBREVIATIONS AND SYMBOLS

A&O	alert and oriented	pc	after meals
ā	before	PE	physical examination
ac	before meals	per	by / through
ad lib.	as desired, at discretion	PLOF	prior level of function
ADLs	activities of daily living	p.o.	by mouth
AMA	against medical advice	post-op	after surgery (operation)
B/S	bedside	pre-op	before surgery (operation)
bid	twice a day	prn	as needed
BRP	bathroom privileges	Pt. or pt.	patient
ċ	with	PTA	prior to admission
c/o	complains of	q	every
CC or C/C	chief complaint	qd	every day, once daily
cont.	continue	qid	four times a day
D/C or d/c	discharge, discontinue	qh	every hour
DNR	do not resuscitate	q2h	every two hours
DOB	date of birth	qod	every other day
Dx	diagnosis	re:	regarding, concerning
ELOS	estimated length of stay	R/O or r/o	rule out
EOB	edge of bed	ROS	review of systems
eval.	evaluate, evaluation	Rx	prescription, intervention plan
FH	family history	̄	without
h or hr.	hour	S/P or s/p	status post
H&P	history and physical	sig	directions for use, give as follows, let it be labeled
h/o	history of	S:	Subjective
		O:	Objective
		A:	Assessment
		P:	Plan
HOB	head of bed	stat.	immediate(ly)
ht.	height	STG	short-term goal
Hx	history	Sx	symptoms
LOS	length of stay	tid	three times a day
LTG	long-term goal	tiw	three times a week
Meds	medications	TO or t.o.	telephone order
Noc	night, at night	tol	tolerate, tolerated, tolerance
NPO or npo	nothing by mouth	Tx	treatment, traction

TABLE 2-14

ABBREVIATIONS AND SYMBOLS—cont'd

OOB	out of bed	VO or v.o.	verbal order
OTC	over the counter	y/o or y.o.	year old
p̄	after	wt.	weight
<i>Symbols</i>			
~ or ≈	approximately	/	per
Δ	change	1°	primary
↓	down, downward, decreased, diminished	→	to, progressing toward, approaching
♀	female	2°	secondary, secondary to
♂	male	↔	to and from
∅	no, none	↑	up, upward, increased
#	number (#5) or pounds (5# wt.)		
x	number of times (x5, 5x) or minutes (x5 min)		



Learning Style Tip

Use a set of handheld white boards/dry-erase boards for a game show-type study session. Each person, or team, gets a board on which to write the answers. One person calls out a term or definition to decipher. The first team to hold up the board with the correct answer gets a point. The first team to get 10 points wins.

IN A FLASH!

Go to the *DavisPlus* website to print out the Abbreviations and Symbols Flash Cards and run through them at least three times before you continue.

End-of-Chapter Practice Exercises

Deciphering Terms

Occasionally, you will find a word made up of only a prefix and a suffix. Some examples are listed below. Write the correct meaning of these medical terms.

Exercise 16

1. toxic _____
2. autograph _____
3. polyphobia _____

4. anesthesia _____
5. atrophy _____
6. multigravida _____
7. tetraplegia _____
8. hyperemesis _____
9. postprandial _____
10. dyspnea _____
11. bilateral _____
12. hypoxia _____
13. euphoria _____
14. anacusis _____
15. anosmia _____
16. hemiplegia _____
17. polyuria _____
18. bradykinesia _____
19. postpartum _____
20. neoplasm _____

Deciphering Terms

Write the correct abbreviations or symbols for these medical terms.

Exercise 17

1. date of birth _____
2. nothing by mouth _____
3. patient _____
4. history of _____
5. every _____
6. before _____

7. do not resuscitate _____
8. change _____
9. as needed _____
10. without _____
11. by/through _____
12. primary _____
13. symptoms _____
14. after _____
15. rule out _____
16. secondary to _____
17. female _____
18. with _____
19. year old _____
20. male _____

Multiple Choice

Select the one best answer to the following multiple-choice questions.

Exercise 18

1. Which of the following prefixes is matched with the correct definition?
 - a. *ambi-*: against
 - b. *an-*: with
 - c. *pan-*: without
 - d. *bi-*: two
2. The prefixes *hemi-* and *semi-* mean:
 - a. both, both sides
 - b. twice, two, double
 - c. half
 - d. whole

3. Which of the following prefixes is matched with the correct definition?
- a. *infra*: above
 - b. *pro*: beyond
 - c. *re*: behind, back
 - d. *ultra*: after
4. Which of the following prefixes means *bad* or *inadequate*?
- a. *mal*-
 - b. *eu*-
 - c. *tox*-
 - d. *auto*-
5. The prefix *auto*- means:
- a. new
 - b. poison
 - c. self
 - d. none of these
6. The suffix *-pexy* means:
- a. widening, stretching, expanding
 - b. surgical fixation
 - c. surgical puncture
 - d. measurement
7. Which of the following suffixes is matched with the correct definition?
- a. *-phoria*: fear
 - b. *-phobia*: feeling
 - c. *-dynia*: pain
 - d. *-algia*: sound
8. Which of the following suffixes is matched with the correct definition?
- a. *-edema*: eating
 - b. *-lith*: loosening
 - c. *-malacia*: softening
 - d. *-megaly*: measurement

9. Which of the following suffixes is matched with the correct definition?
- a. *-paresis*: pregnancy
 - b. *-partum*: partial
 - c. *-plegia*: pain
 - d. *-pnea*: breathing
10. All of the following suffixes mean *pertaining to* **except**:
- a. *-ar*
 - b. *-ory*
 - c. *-itis*
 - d. *-tic*
11. All of the following prefixes mean *without, not, or absence of* **except**:
- a. *an-*
 - b. *in-*
 - c. *uni-*
 - d. *a-*
12. Which of the following prefixes means *all*?
- a. *pan-*
 - b. *ambi-*
 - c. *multi-*
 - d. *micro-*
13. The prefix *di-* means:
- a. diagonal
 - b. diagram
 - c. dilate
 - d. none of these
14. The prefixes *a-*, *an-*, and *in-* all mean:
- a. both, double
 - b. without, not, of
 - c. many, much
 - d. none of these

15. Which of the following prefixes is matched with the correct definition?
- a. *mono-*: one, single
 - b. *multi-*: twice
 - c. *a-*: with
 - d. *hemi-*: whole
16. Which of the following prefixes is matched with the correct definition?
- a. *neo-*: new
 - b. *eu-*: good, normal
 - c. *dys-*: bad, painful
 - d. all of these
17. Which of the following prefixes means *bad, painful, or difficult*?
- a. *tox-*
 - b. *eu-*
 - c. *dys-*
 - d. *neo-*
18. The prefix *neo-* means:
- a. self
 - b. bad
 - c. new
 - d. none of these
19. The suffix *-ician* means:
- a. field of medicine
 - b. study of
 - c. specialist
 - d. physician
20. Which of the following suffixes is matched with the correct definition?
- a. *-lysis*: flow, discharge
 - b. *-cele*: pregnant woman
 - c. *-kinesia*: movement
 - d. *-uresis*: eating, swallowing

21. Which of the following suffixes is matched with the correct definition?
- a. *-ology*: study of
 - b. *-opsy*: vision, view of
 - c. *-cidal*: destroying, killing
 - d. all of these
22. Which of the following suffixes is matched with the correct definition?
- a. *-iasis*: illusion
 - b. *-necrosis*: tissue death
 - c. *-oma*: hernia
 - d. *-oxia*: air
23. All of the following suffixes mean *pain* **except**:
- a. *-algesic*
 - b. *-dynia*
 - c. *-phobia*
 - d. *-algia*
24. Which of the following terms has been correctly changed to the plural form?
- a. thorax: thoraces
 - b. diagnosis: diagnoses
 - c. diverticulum: diverticula
 - d. all of these
25. Which of the following prefixes means *in, within, or inner*?
- a. *endo-*
 - b. *contra-*
 - c. *super-*
 - d. *trans-*