

MEDICAL TERMINOLOGY

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SUZANNE S. FRUCHT

Brief Contents

1	Introduction to Medical Terminology	1
2	Body Organization and Medical Care	21
3	Integumentary System	47
4	Musculoskeletal System	83
5	Cardiovascular System	143
6	Blood and the Lymphatic and Immune Systems	185
7	Respiratory System	231
8	Digestive System	273
9	Urinary System	319
10	Reproductive System	353
11	Endocrine System	407
12	Nervous System	441
13	Special Senses: The Eye and Ear	481
14	Special Topics	527
	Appendices	583
	Answer Keys	604
	Glossary/Index	620

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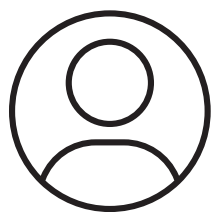
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Dedication

To my husband for his love and encouragement.

Bonnie Fremgen

To my granddaughter, Adrienne,
who every day brings a smile to my face.

To Danielle Doller, whose incredible editing skills (and friendship)
have made each edition of this text better.

Suzanne Frucht

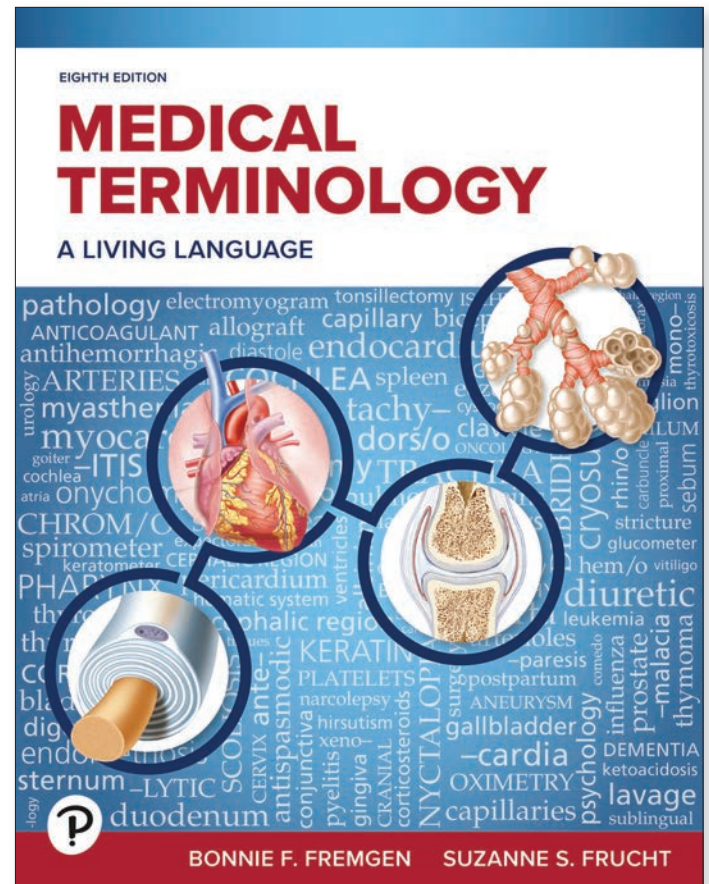
Welcome!

Welcome to the fascinating study of medical terminology—a vital part of your preparation for a career as a health professional. We are glad that you have joined us. Throughout your career, in a variety of settings, you will use medical terminology to communicate with coworkers and patients. Employing a carefully constructed learning system, ***Medical Terminology: A Living Language*** has helped thousands of readers gain a successful grasp of medical terminology within a real-world context.

In developing this book, we had eight goals in mind:

1. To provide you with a clear introduction to the basic rules of using word parts to form medical terms.
2. To use phonetic pronunciations that will help you more easily pronounce terms by spelling out the word part according to the way it sounds. To understand that pronunciations may vary depending on where a person was born or educated but that there is only one correct spelling of a term.
3. To help you understand medical terminology within the context of the human body systems. Realizing that this book is designed for a terminology course and not an anatomy and physiology course, we have aimed to stick to only the basics.
4. To help you develop a full range of Latin and Greek word parts used to build medical terms so that you will be able to interpret unfamiliar terms you encounter in the future.
5. To help you establish a working vocabulary of modern-language (not based on Latin and Greek word parts) medical terms.
6. To help you visualize medical terminology with an abundance of real-life photographs and accurate illustrations.
7. To provide you with a wealth of practice applications throughout and at the end of each chapter to help you review and master the content as you go along.
8. To create rich multimedia practice opportunities for you by way of MyLab Medical Terminology.

Please turn the page to get a glimpse of what makes this book an ideal guide to your exploration of medical terminology.



A Guide to What Makes This Book Special

Streamlined Content

Fourteen chapters and only the most essential anatomy and physiology coverage make this book a perfect mid-sized fit for a one-term course.

Brief Contents

- 1 Introduction to Medical Terminology 1
 - 2 Body Organization and Medical Care 21
 - 3 Integumentary System 47
 - 4 Musculoskeletal System 83
 - 5 Cardiovascular System 143
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 - 7 Respiratory System 231
 - 8 Digestive System 273
 - 9 Urinary System 310
 - 10 Reproductive System 363
 - 11 Endocrine System 407
 - 12 Nervous System 441
 - 13 Special Senses: The Eye and Ear 481
 - 14 Special Topics 527
- Appendices 583
Answer Keys 604
Glossary/Index 620

Chapter-Opening Page Spreads

“At a Glance” and “Illustrated” pages begin each chapter, providing a quick snapshot of what’s covered.

INTEGUMENTARY SYSTEM

AT A GLANCE

Function
The skin provides a protective two-way barrier between our internal environment and the outside world. It also plays an important role in temperature regulation, houses sensory receptors to detect the environment around us, and secretes important fluids.

Organs
The primary structures that comprise the integumentary system:

hair	skin
nails	sweat glands
sebaceous glands	

Word Parts
Presented here are the most common word parts (with their meanings) used to build integumentary system terms. For a more comprehensive list, refer to the Terminology section of this chapter.

Combining Forms

albin/o	white	myc/o	fungus
cauter/o	to burn	necr/o	death
cry/o	cold	onych/o	nail
cutane/o	skin	pedicul/o	lice
derm/o	skin	phot/o	light
dermat/o	skin	py/o	pus
diaphor/o	profuse sweating	rhytid/o	wrinkle
electr/o	electricity	sarc/o	flesh
erythr/o	red	scler/o	hard
hidr/o	sweat	seb/o	oil
ichthy/o	scaly, dry	system/o	system
kerat/o	hard, horny	trich/o	hair
leuk/o	white	ungu/o	nail
lip/o	fat	vesic/o	sac, bladder
melan/o	black	xer/o	dry

Suffixes
-derma skin condition

Prefixes
allo- other, different from usual
xeno- foreign

Integumentary System Illustrated

hair, p. 53

skin, p. 50

nail, p. 54

Provides some protection; associated with sensory receptors

Protective barrier; houses sensory receptors; secretes sweat and sebum; temperature regulation

Professional Profile

The Professional Profile provides a glimpse into examples of possible career opportunities within medical specialties related to the body systems or medical fields discussed in the chapter. Each profession's description includes a link to a related website where more information can be found.

Anatomy and Physiology

Prior to being introduced to terms associated with an organ system, the anatomy and physiology of that body system is described in concise and easy-to-understand language. Information coverage begins with the overall function and the organs that comprise the system. Then each organ is addressed with its structure and how it contributes to the function of that system. Having a grasp of this basic level of information before being introduced to terms associated with each system makes it easier for students to understand the pathologic, diagnostic, and therapeutic terms.

Color-Coded Word Parts

Red combining forms, blue suffixes, and green prefixes allow for quick recognition throughout the book.

234 Chapter 7

Anatomy and Physiology of the Respiratory System

What's in a Name?

Search for these word parts:

hal/o = to breathe
ox/i = oxygen
-al = pertaining to
di- = two
ex- = outward
in- = inward

Word Watch

The terms **inhalation** and **inspiration** (**in-** = inward + **spir/o** = breathing) can be used interchangeably. Similarly, the terms **exhalation** and **expiration** (**ex-** = outward + **spir/o** = breathing) are interchangeable.

What's in a Name?

Search for these word parts:
muc/o = mucus
-ous = pertaining to

Med Term Tip

Anyone who has experienced a nosebleed, or **epistaxis**, is aware of the plentiful supply of blood vessels in the nose.

Word Watch

The term **cilia** means *hair*, and there are other body systems that have cilia or cilia-like processes. For example, when discussing the eye, **cilia** means eyelashes.

bronchial tubes (BRONG-kee-ah)

carbon dioxide

exhalation (eks-hah-LAY-shun)

external respiration

inhalation (in-hah-LAY-shun)

internal respiration

larynx (LAIR-inks)

lungs

nasal cavity (NAY-zal)

oxygen (OK-sih-jen)

pharynx (FAIR-inks)

trachea (TRAY-kee-ah)

ventilation

The organs of the respiratory system include the **nasal cavity**, **pharynx**, **larynx**, **trachea**, **bronchial tubes**, and **lungs**. These organs function together to perform the mechanical and, for the most part, unconscious mechanism of respiration. The cells of the body require the continuous delivery of oxygen and removal of carbon dioxide. The respiratory system works in conjunction with the cardiovascular system to deliver oxygen to all the cells of the body. The process of respiration must be continuous; interruption for even a few minutes can result in brain damage and/or death.

The process of respiration can be subdivided into three distinct parts: **ventilation**, **external respiration**, and **internal respiration**. Ventilation is the flow of air between the outside environment and the lungs. **Inhalation** is the flow of air into the lungs, and **exhalation** is the flow of air out of the lungs. Inhalation brings fresh **oxygen** (O_2) into the air sacs, while exhalation removes **carbon dioxide** (CO_2) from the body.

External respiration refers to the exchange of oxygen and carbon dioxide that takes place in the lungs. These gases diffuse in opposite directions between the air sacs of the lungs and the bloodstream. Oxygen enters the bloodstream from the air sacs to be delivered throughout the body. Carbon dioxide leaves the bloodstream and enters the air sacs to be exhaled from the body.

Internal respiration is the process of oxygen and carbon dioxide exchange at the cellular level when oxygen leaves the bloodstream and is delivered to the tissues. Oxygen is needed for the body cells' metabolism, all the physical and chemical changes within the body that are necessary for life. The by-product of metabolism is the formation of a waste product, carbon dioxide. The carbon dioxide enters the bloodstream from the tissues and is transported back to the lungs for disposal.

Nasal Cavity

cilia (SIL-ee-ah)

mucus (MYOO-kus)

mucous membrane

nares (NAIR-eer)

nasal septum

palate (PAL-et)

paranasal sinuses (pair-ah-NAY-zal)

The process of ventilation begins with the nasal cavity. Air enters through two external openings in the nose called the **nares**. The nasal cavity is divided down the middle by the **nasal septum**, a cartilaginous plate. The **palate** in the roof of the mouth separates the nasal cavity above from the mouth below. The walls of the nasal cavity and the nasal septum are made up of flexible cartilage covered with **mucous membrane** (refer to Figure 7-1 ■). In fact, much of the respiratory tract is covered with mucous membrane, which secretes a sticky fluid, **mucus**, to help cleanse the air by trapping dust and bacteria. Since this membrane is also wet, it moisturizes inhaled air as it passes by the surface of the cavity. Very small hairs or **cilia** line the opening to the nose (as well as much of the airways).

Key Terms

Every Anatomy and Physiology subsection starts with a list of key terms that will be covered in that section. This sets the stage for comprehension and mastery.

Pronunciations

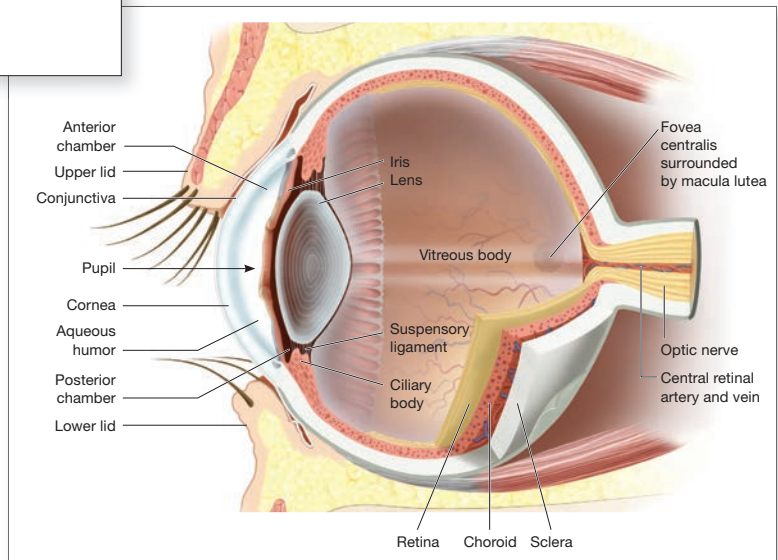
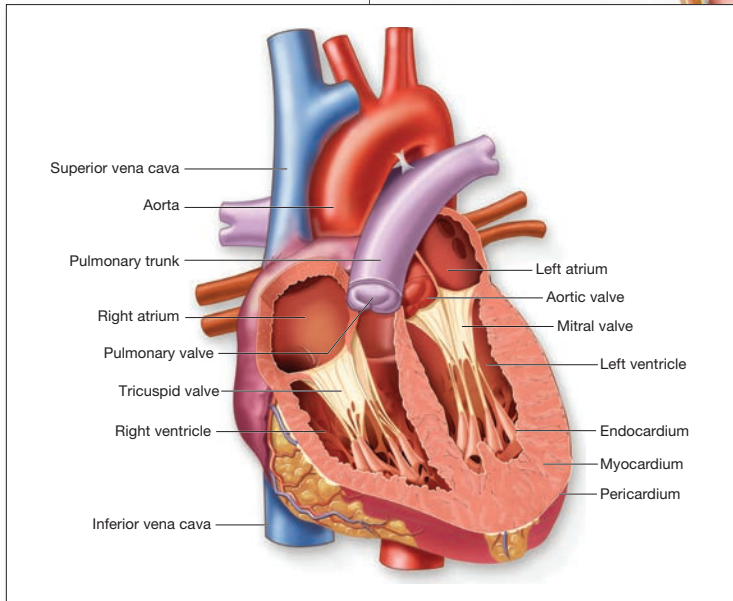
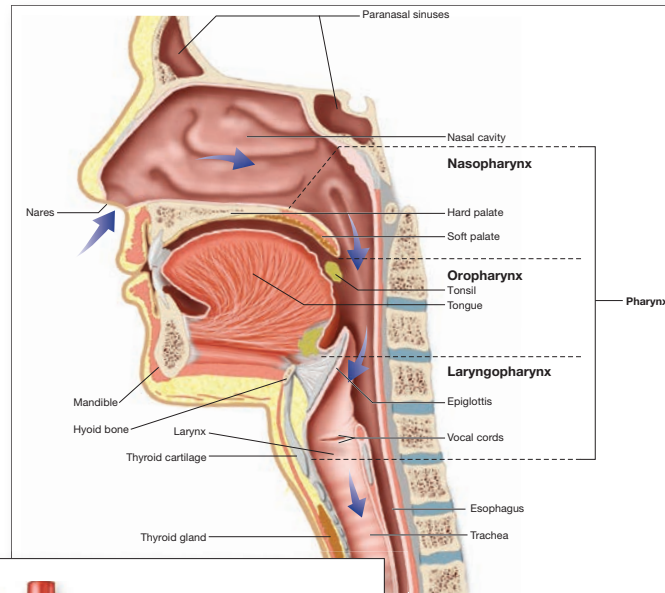
Every chapter includes sound-it-out pronunciations to help students say medical terms accurately.

Informative and Interesting Sidebars

- The popular **Med Term Tip** feature offers tidbits of noteworthy information about medical terms that engage learners.
- **Word Watch** points out words that have a similar sound or similar spelling and also alerts students about abbreviations that have more than one meaning.
- **What's in a Name?** reinforces the breakdown of terms into word parts.
- **Terminology Tidbit** offers interesting information about the etymology of certain terms for additional understanding.

Medically Accurate Illustrations

Concepts come to life with vibrant, clear, and scientifically precise images.



Terminology Tables

Terms are categorized and presented in a clear, logical, color-coded format that eases the learning process. The major categories included in each chapter are Word Parts Used to Build Chapter Terms, Pathology, Adjective Forms, Diagnostic Procedures, Therapeutic Procedures, Pharmacology, and Abbreviations. Each major category table is further subdivided into smaller subsections of related terms, thereby making learning easier. Also, the three-column format of the tables allows for the term (with pronunciation and/or abbreviation), word parts (if appropriate), and definitions to be displayed. The Pharmacology table also includes drug name examples in a fourth column.

Terminology

WORD PARTS USED TO BUILD INTEGUMENTARY SYSTEM TERMS

The following lists contain the combining forms, suffixes, and prefixes used to build terms in the remaining sections of this chapter.

Combining Forms			
albin/o white	diaphor/o profuse sweating	onych/o nail	
angi/o vessel (refer to Chapter 5)	electr/o electricity	pedicul/o lice	
bas/o base	erythr/o red	phot/o light	
bi/o life	esthesi/o feeling (refer to Chapter 12)	py/o pus	
carcin/o cancer	hem/o blood (refer to Chapter 6)	rhytid/o wrinkle	
cauter/o to burn	hidr/o sweat	sarc/o flesh	
chem/o chemical	ichthy/o scaly, dry	scler/o hard	
cis/o to cut	kerat/o hard, horny	seb/o oil	
cortic/o outer layer (refer to Chapter 4)	lip/o fat	septic/o infection (refer to Chapter 6)	
cry/o cold	leuk/o white	system/o system	
cutane/o skin	melan/o black	trich/o hair	
cyt/o cell	myc/o fungus	ungu/o nail	
derm/o skin	necr/o death	vesic/o sac	
dermat/o skin		xer/o dry	

Suffixes			
-al pertaining to	-ism state of	-phagia eat, swallow (refer to Chapter 8)	
-derma skin condition	-itis inflammation	-plasty surgical repair	
-ectomy surgical removal	-logy study of	-rrhea discharge	
-emia blood condition (refer to Chapter 6)	-malacia abnormal softening	-tic pertaining to	
-ia state, condition	-oma mass, tumor	-tome instrument to cut	
-iasis abnormal condition	-opsy view of	-ule small	
-ic pertaining to	-osis abnormal condition		
	-ous pertaining to		

Prefixes			
allo- other	epi- above	intra- within	
an- without	ex- outward	para- beside	
anti- against	hyper- excessive	sub- under	
auto- self	hypo- below	xeno- foreign	
de- without			

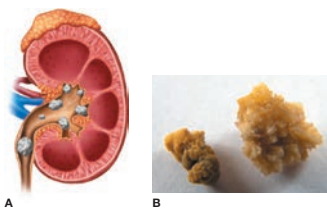
PHARMACOLOGY

Classification	Word Parts	Action	Examples
antibiotic (an-tih-bye-AW-tik)	anti- = against bi/o = life -tic = pertaining to	Kills bacteria causing respiratory infections	amoxicillin, Amoxil; ampicillin; ciprofloxacin, Cipro
Med Term Tip There are three accepted pronunciations for the prefix anti- , "an-tih," "an-tee," and "an-tye."			
antihistamine (an-tih-HIST-ah-meen)	anti- = against	Blocks effects of histamine released by body during allergy attack	diphenhydramine, Benadryl; fexofenadine, Allegra; loratadine, Claritin
antitussive (an-tih-TUSS-iv)	anti- = without tuss/o = cough	Relieves urge to cough	dextromethorphan, Vicks Formula 44; hydrocodone, Hycodan
bronchodilator (BRONG-koh-dye-lay-ter)	bronch/o = bronchus	Relaxes muscle spasms in bronchial tubes; used to treat asthma	albuterol, Proventil, Ventolin; salmeterol, Serevent
corticosteroids (kor-tih-koh-STAIR-oydz)	cortic/o = outer layer, cortex	Reduce inflammation and swelling in respiratory tract	fluticasone, Flonase; mometasone, Nasone; triamcinolone, Azmacort

ABBREVIATIONS

i	one	LVN	licensed vocational nurse
ii	two	MM	malignant melanoma
iii	three	mpox	monkeypox
ADN	registered nurse with associate's degree	MSN	registered nurse with master's degree
BCC	basal cell carcinoma	NIH	National Institutes of Health
BSN	registered nurse with bachelor's degree	NP	nurse practitioner
BX, bx	biopsy	oint	ointment
C&S	culture and sensitivity	qid	four times a day
CNA	certified nursing assistant	RN	registered nurse
decub	decubitus ulcer	SCC	squamous cell carcinoma
Derm, derm	dermatology	SG	skin graft
FS	frozen section	SLE	systemic lupus erythematosus
I&D	incision and drainage	ST	split-thickness
ID	intra-dermal	subcut	subcutaneous
Word Watch Be careful when using the abbreviation ID meaning intradermal and I&D meaning incision and drainage.		tid	three times a day
		UV	ultraviolet
		WHO	World Health Organization
LPN	licensed practical nurse	x	times

PATHOLOGY

Term	Word Parts	Definition
Medical Specialties		
nephrology (neh-FROL-oh-jee)	nephro/o = kidney -logy = study of	Branch of medicine involved in diagnosis and treatment of diseases and disorders of the kidney; physician is a <i>nephrologist</i>
urology (yoo-RALL-oh-jee)	ur/o = urine -logy = study of	Branch of medicine involved in diagnosis and treatment of diseases and disorders of the urinary system (and male reproductive system); physician is a <i>urologist</i>
Signs and Symptoms		
anuria (an-YOO-ree-ah)	an- = without -uria = urine condition	Condition of kidneys not producing (without) urine, a complete lack of urine excretion
azotemia (az-oh-TEE-mee-ah)	azot/o = nitrogenous waste -emia = blood condition	Accumulation of nitrogenous waste in bloodstream; occurs when either one or both of the kidneys fail to filter these wastes from the blood
bacteriuria (bak-teer-ee-YOO-ree-ah)	bacteri/o = bacteria -uria = urine condition	Presence of bacteria in the urine
calculus (KAL-kyoo-lus)	Terminology Tidbit The word calculus comes from the Latin word calculus meaning pebble.	
Figure 9-8 A) Illustration of kidney with multiple calculi (stones) in the renal pelvis and ureter. B) Photo of two kidney stones. Note the crystal-like sharp points (remid:4.9802/Shutterstock). 		
cystalgia (sis-TAL-jee-ah)	cyst/o = bladder, sac -algia = pain	Bladder pain; especially used to indicate urinary bladder pain
Word Watch Be careful using the combining forms cyst/o meaning bladder or sac and cyt/o meaning cell.		
cystorrhagia (sis-toh-RAY-jee-ah)	cyst/o = bladder, sac -rrhagia = abnormal flow condition	Abnormal bleeding (flow) from the urinary bladder
diuresis (dye-yoo-REE-sis)		Increased formation and excretion of urine
dysuria (dis-YOOR-ee-ah)	dys- = painful, difficult -uria = urine condition	Condition of difficult or painful urination

THERAPEUTIC PROCEDURES		
Term	Word Parts	Definition
Medical Procedures		
automated external defibrillator (AED) (dee-FIB-rih-lay-ter)	de- = without	Portable device that automatically detects life-threatening arrhythmias and delivers appropriate electrical shock; designed to be used by nonmedical personnel and found in public places such as shopping malls and schools
cardiopulmonary resuscitation (CPR) (kar-dee-oh-PULL-mon-air-ee / ree-suss-ih-TAY-shun)	cardi/o = heart pulmon/o = lung -ary = pertaining to	Medical procedure to restore cardiac output and oxygenated air to lungs for person in cardiac arrest; combination of chest compressions (to push blood out of heart) and artificial respiration (to blow air into lungs) is performed by one or two CPR-trained rescuers
 ■ Figure 5-23 Woman practicing CPR on specialized manikin called resusci anne. (basik/12397)		
defibrillation (dee-fib-rih-LAY-shun)	de- = without	Medical procedure that converts serious irregular heartbeats, such as fibrillation, by giving electric shocks to heart using instrument called defibrillator; also called <i>cardioversion</i>
 ■ Figure 5-24 An emergency medical technician positions defibrillator paddles on the chest of a supine male patient. <i>Phyll Jackson/Person Education, Inc.</i>		

DIAGNOSTIC PROCEDURES		
Term	Word Parts	Definition
Clinical Laboratory Tests		
human papillomavirus (HPV) DNA test (pap-ih-LOH-mah-vigh-russ)		Test to determine infection by human papillomavirus (HPV); a virus responsible for cervical cancer; examination of sample of cervical tissue obtained by swabbing or scraping cervix
Pap smear (pap-ah-NIK-oh-lao)		Test for early detection of cancer of the cervix; a scraping of cells is removed from the cervix for examination under microscope
Terminology Tidbit This test is named for George Papanicolaou, a Greek physician who pioneered early cancer detection by developing what is now the Pap smear in the 1940s to 1950s.		
pregnancy test (PREG-nan-see)		Chemical test that can determine pregnancy during first few weeks; can be performed in physician's office or with home-testing kit; tests for presence of <i>human chorionic growth hormone</i> (HCG, hCG) in blood or urine
vaginal smear wet mount (VAJ-in-ai)	vagin/o = vagina -al = pertaining to	Test used to diagnose candidiasis; microscopic examination of cells obtained by swabbing vaginal wall
Diagnostic Imaging		
endovaginal ultrasonography (US) (en-doh-VAJ-ih-nal / ul-trah-son-OG-rah-fee)	endo- = within vagin/o = vagina -al = pertaining to ultra- = beyond son/o = sound	Ultrasound procedure in which sound head is placed within the vagina rather than on abdominal surface; results in more detailed sonogram

ADJECTIVE FORMS OF ANATOMICAL TERMS		
Term	Word Parts	Definition
basophilic (bay-soh-FILL-ik)	bas/o = base -philic = pertaining to being attracted to	Pertaining to [a leukocyte] that attracts a basic pH stain
eosinophilic (ee-oh-sin-oh-FILL-ik)	eosin/o = rosy red -philic = pertaining to being attracted to	Pertaining to [a leukocyte] that attracts a rosy red stain
erythrocytic (eh-rith-roh-SIT-ik)	erythr/o = red -cytic = pertaining to cells	Pertaining to a red blood cell
fibrinous (FYE-brin-us)	fibrin/o = fibers -ous = pertaining to	Pertaining to fibers
hematic (hee-MAT-ik)	hemat/o = blood -ic = pertaining to	Pertaining to blood
leukocytic (loo-koh-SIT-ik)	leuk/o = white -cytic = pertaining to cells	Pertaining to a white blood cell
lymphocytic (lim-foh-SIT-ik)	lymph/o = lymph -cytic = pertaining to cells	Pertaining to a [white] cell formed in lymphatic tissue
monocytic (mon-oh-SIT-ik)	mono- = one -cytic = pertaining to cells	Pertaining to a [white] cell with one large nucleus
neutrophilic (noo-troh-FILL-ik)	neutr/o = neutral -philic = pertaining to being attracted to	Pertaining to [a leukocyte] that attracts a neutral pH stain
sanguineous (sang-GWIN-ee-us)	sanguin/o = blood -ous = pertaining to	Pertaining to blood
Word Watch The term <i>sanguineous</i> has an unusual spelling; an <i>e</i> is added between the word root, <i>sanguin</i> , and the suffix, <i>-ous</i> .		
thrombocytic (throm-boh-SIT-ik)	thromb/o = clot -cytic = pertaining to cells	Pertaining to a clotting cell; a platelet
thrombotic (throm-BOT-ik)	thromb/o = clot -tic = pertaining to	Pertaining to a clot

Practice As You Go

An assortment of exercises is peppered throughout the chapters to assess students' understanding of the material discussed.

PRACTICE AS YOU GO

F. Complete the Statement

- The organs of the lymphatic system other than lymphatic vessels and lymph nodes are the _____, and _____.
- The two lymph ducts are the _____ and _____.
- The primary concentrations of lymph nodes are the _____, _____, and _____ regions.
- _____ immunity develops following direct exposure to a pathogen.
- Humoral immunity is also referred to as _____ immunity.

PRACTICE AS YOU GO

D. Terminology Matching

Match each term to its definition.

- | | |
|------------------------------|--|
| 1. _____ salpingocystis | a. seizures and coma during pregnancy |
| 2. _____ dysmenorrhea | b. type of ectopic pregnancy |
| 3. _____ breech presentation | c. detached placenta |
| _____ abruptio placentae | d. yeast infection |
| _____ eclampsia | e. abnormal discharge from breast |
| _____ pyosalpinx | f. newborn |
| _____ fibroid | g. buttocks first to appear in birth canal |
| _____ candidiasis | h. painful menstruation |
| _____ lactorrhea | i. pus in the uterine tube |
| _____ neonate | j. benign tumor |

Chapter Review

▼ **Real-World Applications**—Three critical thinking activities allow students to apply their medical knowledge to true-to-life scenarios:

REAL-WORLD APPLICATIONS

Medical Record Analysis
This High-Risk Obstetrics Consultation Report contains 12 medical terms. Underline each term and write it in the list below the report. Then explain each term as you would to a nonmedical person.

High-Risk Obstetrics Consultation Report

Reason for Consultation: High-risk pregnancy with late-term bleeding

History of Present Illness: Patient is 25 years old. She is currently estimated to be at 17½ weeks' gestation. Amniocentesis at 23 weeks shows a normally developing male fetus. She noticed a moderate degree of bleeding this morning but denies any cramping or pelvic pain. She immediately saw her obstetrician who referred her for high-risk evaluation.

Past Medical History: This patient is multigravida but nullipara with three early miscarriages without obvious cause.

Results of Physical Examination: Patient appears well nourished and abdominal girth appears consistent with length of gestation. Pelvic ultrasound indicates placenta previa with placenta almost completely overlying cervix. However, there is no evidence of abruptio placentae at this time. Fetal size appears to be consistent with 22 weeks' gestation. The fetal heartbeats is strong with a rate of 130 beats/minute.

Recommendations: Fetus appears to be developing well and in no distress at this time. The placenta appears to be well attached on ultrasound, but the bleeding is cause for concern. With the extremely low position of the placenta, this patient is at very high risk for abruptio placentae. She will require C-section at onset of labor.

Term	Explanation
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____
6. _____	_____
7. _____	_____
8. _____	_____
9. _____	_____
10. _____	_____
11. _____	_____
12. _____	_____

▲ **1) Medical Record Analysis**
Exercises that challenge students to read examples of real medical records and then to apply their medical terminology knowledge to identify and explain each term.

Chart Note Transcription
The chart note below contains 10 phrases that can be reworded with a medical term presented in this chapter. Each phrase is identified with an underline. Determine the medical term and write your answers in the spaces provided.

Pearson General Hospital Consultation Report

Date: 17 May 2017

Current Complaint: A 64-year-old female with an open sore 1 on her right leg is seen by the specialist in treating diseases of the skin. 2

Past History: Patient states she had noticed an area of pain, swelling, 3 and redness of the skin. 4 just below her right knee about six weeks ago. One week later, pus 5 exuded from the 6 opening. Patient notes the spots redness and the open sore appeared.

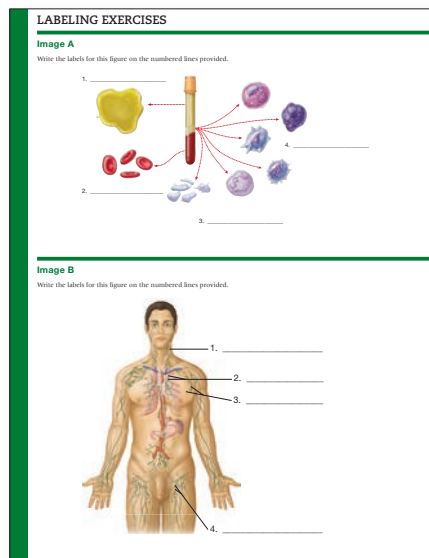
Signs and Symptoms: Patient has a deep open sore 5 × 3 cm, 8 is 4 cm distal to the knee on the lateral aspect of the right leg. It appears to extend into the dermis. 9 8 and the edges show signs of inflammation. 7 The open sore has a small amount of drainage but there is no odor. A specimen of the drainage that was applied to the skin to identify the microorganisms and determine the best antibiotic. 8 of the drainage revealed Staphylococcus bacteria in the open sore.

Diagnosis: Inflammation of the skin 9 in the skin 9

Treatment: Specimen of drainage 10 of the open sore followed by application of an antibiotic cream. Patient was instructed to return to the skin disease specialist's office in two weeks, or sooner if the open sore does not heal or if it begins draining pus.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

▲ **2) Chart Note Transcription**
Slice-of-real-life exercise that asks students to replace lay terms in a medical chart with the proper medical term.



▲ Additionally, **Labeling Exercises** provide a visual challenge to reinforce students' grasp of anatomical structures.

Case Study
Below is a case study presentation of a patient with a condition discussed in this chapter. Read the case study and answer the questions below. Some questions will ask for information not included in this chapter. Use your text, a medical dictionary, or any other reference material you choose to answer these questions.

Questions

1. What pathological condition does this patient have? Research this condition in a reference source and include a short description of it.
2. What type of long-term damage may occur in a patient with rheumatoid arthritis?
3. How would you describe the other major type of arthritis mentioned in this book?
4. What two diagnostic procedures did the physician order? Describe them in your own words. What were the results? (One of these procedures is described in Chapter 6 of this text.)
5. What treatments were ordered? Explain what the physical therapy procedures involve.
6. This patient is experiencing an acute episode. How would you explain what this phrase means and how would you contrast it with chronic?

▲ **3) Case Study**
Scenarios that use critical thinking questions to help students develop a firmer understanding of the terminology in context.

PRACTICE EXERCISES

A. Word Building Practice
The combining form cardi/o refers to the heart. Use it to write a term that means:

1. pertaining to the heart _____
2. disease of the heart muscle _____
3. enlargement of the heart _____
4. fast heart condition _____
5. slow heart condition _____
6. record of heart electricity _____

The combining form angi/o refers to the vessel. Use it to write a term that means:

7. vessel narrowing _____
8. vessel inflammation _____
9. involuntary muscle contraction of a vessel _____

The combining form arteri/o refers to the artery. Use it to write a term that means:

10. pertaining to an artery _____
11. hardening of an artery _____
12. small artery _____

Add the appropriate prefix to carditis to form the term that matches each definition:

13. inflammation of the inner lining of the heart _____
14. inflammation of the outer layer of the heart _____
15. inflammation of the muscle of the heart _____

B. Anatomical Adjectives
Fill in the blank with the missing noun or adjective.

Noun	Adjective
1. arteri _____	_____
2. arterios _____	_____
3. _____	cardiac
4. vein _____	_____
5. _____	arterial
6. _____	ventricular
7. valve _____	_____
8. heart muscle _____	_____
9. ventricle _____	_____
10. _____	coronary
11. _____	vascular
12. _____	arterial

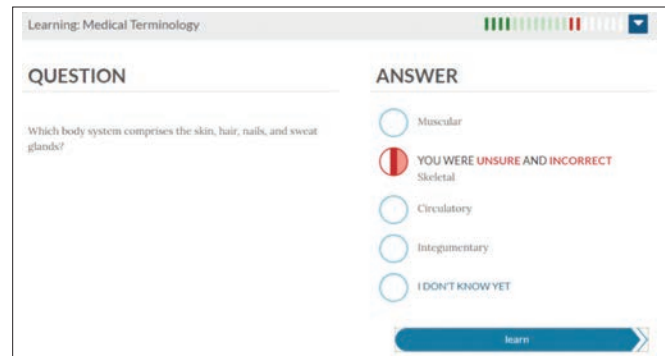
▲ **Practice Exercises**—A wide array of updated workbook exercises at the end of each chapter serve as a fun and challenging study review. A larger variety of question types leads to a more engaging assessment of student understanding of concepts like spelling, proper use of terms, adjective formation, word building, and anatomy and physiology.

MyLab Medical Terminology™

What is MyLab Medical Terminology?

MyLab Medical Terminology is a flexible and engaging online that gives you, the student, the opportunity to test your understanding of information, concepts, and medical language to see how well you know the material. From test results, MyLab Medical Terminology builds a self-paced, personalized study plan unique to your needs. Remediation in the form of etext pages, illustrations, exercises, audio segments, and video clips is provided for those areas in which you may need additional instruction, review, or reinforcement. You can then work through the program until your study plan is complete and you have mastered the content. MyLab Medical Terminology is available with an embedded etext.

MyLab Medical Terminology is organized to follow the chapters and learning outcomes in *Medical Terminology: A Living Language*. With MyLab Medical Terminology, you can track your own progress through your entire med term course.



How do Students Benefit?

Here's how MyLab Medical Terminology helps you.

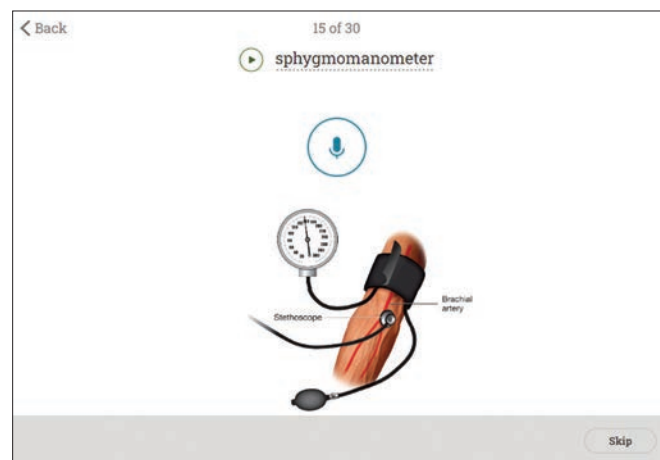
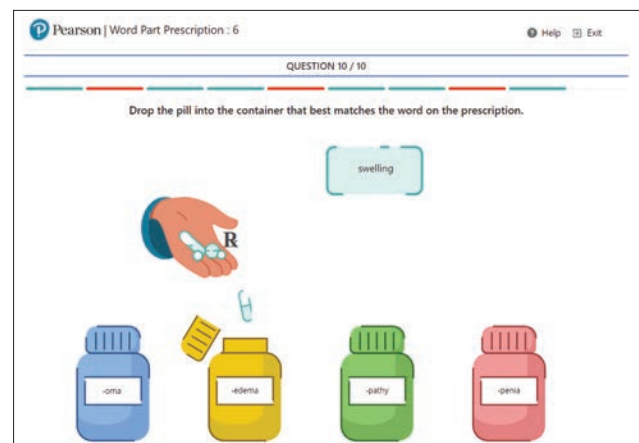
- Keep up with information presented in the text and lectures.
- Save time by focusing study and review just the content you need.
- Increase understanding of difficult concepts with study material for different learning styles.
- Practice building, pronouncing & spelling medical terms

Key Features of MyLab Medical Terminology

Interactive Study Games. Fun and engaging activities give students practice building words, labeling body parts, and spelling and pronunciation medical terms with technology that assesses and scores students' skills as they can continue to improve.

Personalized Study Material. Based on the topic pretest results, you receive a personalized study plan, highlighting areas where you may need improvement. It includes these study tools:

- Links to specific pages in the etext
- Images for review
- Interactive exercises
- Animations and video clips
- Audio glossary
- Access to full Personalized Study Material



How Do Instructors Benefit?

- Save time by providing students with a comprehensive, media-rich study program.
- Track student understanding of course content in the program gradebook.
- Monitor student activity with viewable student assignments.

Preface

Since the first edition of ***Medical Terminology: A Living Language*** was published, it has been noted for its “clean” and logical format that promotes learning. In this revised edition, we have continued to build upon this strength by enhancing many features to make this text an ideal choice for semester- or quarter-length courses.

Features of This Edition

This new eighth edition contains features that facilitate student mastery, while maintaining the best aspects of previous editions. Each chapter is arranged in a similar format and the content is organized with an emphasis on maintaining consistency and accuracy.

We have revised ***Medical Terminology: A Living Language*** so that it provides for an even more valuable teaching and learning experience. Here are the enhancements we have made:

- **NEW! Professional Profile**—The Professional Profile feature provides a glimpse into examples of possible career opportunities within medical specialties related to the body systems or medical fields discussed in the chapter. Each profession’s description includes a link to a related website where more information can be found.
- **NEW! Medical Care Section**—Chapter 2 now includes a Medical Care section providing information about the study and treatment of diseases. As with the rest of the text, each term is broken down into its word parts as appropriate.
- **NEW! Return of the Special Topics Chapter**—As with earlier editions of this book, we have returned to having a Special Topics chapter. Chapter 14 contains timely information and appropriate medical terms relevant to the following medical specialties: pharmacology, mental health, diagnostic imaging, rehabilitation services, surgery, and oncology. Knowledge of these topics is necessary for the well-rounded health-care worker.
- The beginning of the Terminology section in each chapter includes an updated and comprehensive list of all combining forms, suffixes, and prefixes used to build terms in the remaining sections of the chapter.
- **NEW! Updated and More Diverse Art Program**—This new edition showcases even more art than ever before! We have added over 150 new photos of real people, diseases, and conditions related to the chapter content as well as an updated and expanded collection of medical illustrations throughout the text to provide a clearer view of each body system and its related diseases and conditions. We have also strived to include a more diverse array of people to help better reflect the world we live in while also trying to point out areas where skin tone may be important when assessing patient symptoms or diagnosing a condition. As the photos are of actual persons with various diseases, conditions, or injuries, it is important to point out that some of these images are graphic and may be potentially disturbing or triggering for some people.
- As with every edition of this text, this new eighth edition includes many new medical terms to provide even more information for today’s student, especially regarding the newest technologies and procedures.

Organization of the Book

Introductory Chapters

Chapter 1 contains information necessary for an understanding of how medical terms are formed. This includes learning about word roots, combining forms, prefixes, and suffixes and general rules for building medical terms. Readers will learn about terminology for medical records and the different healthcare settings. Chapter 2 presents terminology relating to the body organization, including organs and body systems. This chapter also includes a new discussion about different aspects of medical care including an overview of disease pathology. Here readers will first encounter word-building tables, a feature found in each remaining chapter that lists medical terms and their respective word parts.

Body Systems Chapters

Chapters 3–13 are organized by body system. Each chapter begins with the System At a Glance feature, which lists combining forms, prefixes, and/or suffixes with their meanings and is followed by a System Illustrated overview of the organs in the system. The anatomy and physiology section is divided into the various components of the system, and each subsection begins with a list of key medical terms accompanied by a phonetic pronunciation guide. Key terms are boldfaced the first time they appear in the narrative for easy recognition. The Terminology section of each chapter begins with a list of all word parts used within the chapter. For ease of learning, the medical terms are divided into five separate sections: adjective forms of anatomical terms, pathology, diagnostic procedures, therapeutic procedures, and pharmacology. The word parts used to build terms are highlighted within each table. An abbreviations section then follows to complete each chapter.

Special Topics Chapter

There are many specialized areas within medicine, and each has medical terms relating to that field. Chapter 14 presents medical terminology from six of these fields: pharmacology, mental health, diagnostic imaging, rehabilitation services, surgery, and oncology. For each of these fields, we present terms associated with its vocabulary, pathology, and diagnostic and therapeutic procedures, as well as abbreviations. Each special topic also includes its own Professional Profile feature highlighting examples of occupations in related medical areas.

Appendices

The appendices contain helpful reference lists of word parts and definitions provided in the text. This information is intended for quick access and includes three appendices: Word Parts Arranged Alphabetically and Defined, Word Parts Arranged Alphabetically by Definition, and Abbreviations.

Answer Keys

A comprehensive listing of answers is provided in the back of the book for all of the Practice As You Go exercises, as well as the Chapter Review section's Real-World Applications activities, Practice Exercises, and Labeling Exercises. Students should use these answer keys to check their answers as they complete each chapter to better assess any areas that may need additional study.

Glossary/Index

Lastly, all of the key terms in the book appear again in the combination glossary/index at the end of the text. In addition to providing a page reference for each entry, complete definitions of key terms are also presented for quick access.

About the Authors



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Bonnie F. Fremgen, PhD, is a former Associate Dean of the Allied Health Program at Robert Morris College and was vice president of a hospital in suburban Chicago. She was also director of continuing education at three Chicago-area hospitals. She has taught medical law and ethics courses as well as clinical and administrative topics. In addition, Dr. Fremgen has served as an advisor for students' career planning. She has broad interests and experiences in the health-care field, including hospitals, nursing homes, and physicians' offices as well as responsibility for departments of social services, home health care, discharge planning, quality assurance, and hospital-wide education. She currently has two patents on a unique circulation-assisting wheelchair.

Dr. Fremgen holds a nursing degree as well as a master's in healthcare administration. She received her PhD from the College of Education at the University of Illinois. Dr. Fremgen has performed postdoctoral studies in medical law at Loyola University Law School in Chicago. She has authored five textbooks with Pearson. Dr. Fremgen has also taught ethics at the University of Notre Dame, South Bend, Indiana; University of Detroit, Detroit, Michigan; and Saint Xavier University, Chicago, Illinois.



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Suzanne S. Frucht is an Associate Professor Emeritus of Anatomy and Physiology at Northwest Missouri State University (NWMSU). She holds baccalaureate degrees in biological sciences and physical therapy from Indiana University, an MS in biological sciences at NWMSU, and a PhD in molecular biology and biochemistry from the University of Missouri–Kansas City.

For 14 years Dr. Frucht worked full time as a physical therapist in various healthcare settings, including acute care hospitals, extended care facilities, and home health. Based on her educational and clinical experience, she was invited to teach medical terminology part time in 1988 and became a full-time faculty member three years later as she discovered her love for the challenge of teaching. Dr. Frucht has taught a variety of courses including medical terminology, human anatomy, human physiology, and animal anatomy and physiology. She received the Governor's Award for Excellence in Teaching in 2003. After retiring from teaching in 2008, she continues to be active in student learning through teaching medical terminology as an online course and writing medical terminology texts and anatomy and physiology laboratory manuals.

Our Development Team

We would like to express deep gratitude to the over 120 colleagues from schools across the country who have provided us with many hours of their time over the years to help us tailor this book to suit the dynamic needs of instructors and students. These individuals have reviewed manuscript chapters and illustrations for content, accuracy, level, and utility. We sincerely thank them and feel that ***Medical Terminology: A Living Language*** has benefited immeasurably from their efforts, insights, encouragement, and selfless willingness to share their expertise as educators.

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A Commitment to Accuracy

As a student embarking on a career in healthcare, you probably already know how critically important it is to be precise in your work. Patients and coworkers will be counting on you to avoid errors on a daily basis. Likewise, we owe it to you—the reader—to ensure accuracy in this book. We have gone to great lengths to verify that the information provided in ***Medical Terminology: A Living Language*** is complete and correct. To this end, here are the steps we have taken:

1. **Editorial Review**—We have assembled a large team of developmental consultants (listed on the preceding pages) to critique every word and every image in this book. Multiple content experts have read each chapter for accuracy.
2. **Medical Illustrations**—A team of medically trained illustrators was hired to prepare many of the pieces of art that grace the pages of this book. These illustrators have a higher level of scientific education than the artists for most textbooks, and they worked directly with the authors and members of our development team to make sure that their work was clear, correct, and consistent with what is described in the text.
3. **Accurate Ancillaries**—Realizing that the teaching and learning ancillaries are often as vital to instruction as the book itself, we took extra steps to ensure accuracy and consistency within these components. We assigned some members of our development team to specifically focus on critiquing every bit of content that comprises the instructional ancillary resources to confirm accuracy.

While our intent and actions have been directed at creating an error-free text, we have established a process for correcting any mistakes that may have slipped past our editors. Pearson takes this issue seriously and therefore welcomes any and all feedback that you can provide along the lines of helping us enhance the accuracy of this text. If you identify any errors that need to be corrected in a subsequent printing, please notify us. Thank you for helping Pearson to reach its goal of providing the most accurate medical terminology textbooks available. Any corrections can be sent to us through your institution's Pearson representative or please mail them to:

Pearson Health Science Editorial
Medical Terminology Corrections
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Contents

Welcome! vii
A Guide to What Makes This Book Special viii
MyLab Medical Terminology™ xiv
Preface xv
About the Authors xvii
Our Development Team xviii
A Commitment to Accuracy xxi

1 Introduction to Medical Terminology 1

Medical Terminology at a Glance 2

Building Medical Terms From

Word Parts 3

Word Roots 3

Combining Vowel/Form 3

Prefixes 5

Suffixes 7

Word Building 11

Interpreting Medical Terms 11

Pronunciation 11

Spelling 11

Singular and Plural Endings 12

Abbreviations 13

The Medical Record 13

Healthcare Settings 15

Confidentiality 16

Chapter Review 17

Practice Exercises 17



2 Body Organization and Medical Care 21

Body Organization at a Glance 22

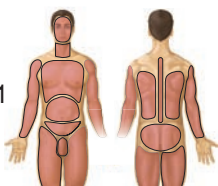
Body Organization Illustrated 23

Levels of Body Organization 24

Cells 24

Tissues 26

Organs and Systems 28



Body 31

Body Planes 31

Body Regions 33

Body Cavities 34

Directional Terms 37

Medical Care 39

Disease, Disorder, and Syndrome 39

Diagnosis, Prognosis, and Treatment 40

Abbreviations 41

Chapter Review 42

Practice Exercises 42

Labeling Exercises 46

3 Integumentary System 47

Integumentary System
at a Glance 48

Integumentary System
Illustrated 49

Anatomy and Physiology of the Integumentary
System 50

The Skin 50

Accessory Organs 52

Terminology 55

Word Parts used to Build Integumentary System
Terms 55

Adjective Forms of Anatomical Terms 56

Pathology 57

Diagnostic Procedures 71

Therapeutic Procedures 71

Pharmacology 73

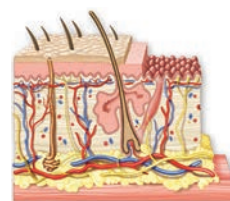
Abbreviations 74

Chapter Review 75

Real-World Applications 75

Practice Exercises 78

Labeling Exercises 81



4 Musculoskeletal System 83

Section I: Skeletal System at a Glance 84

Skeletal System Illustrated 85

Anatomy and Physiology of the Skeletal System 86

Bones 86
Skeleton 90
Joints 97

Terminology 99

Word Parts Used to Build Skeletal System Terms 99
Adjective Forms of Anatomical Terms 100
Pathology 102
Diagnostic Procedures 112
Therapeutic Procedures 113
Pharmacology 116
Abbreviations 117

Section II: Muscular System at a Glance 118

Muscular System Illustrated 119

Anatomy and Physiology of the Muscular System 120

Types of Muscles 120
Naming Skeletal Muscles 122
Skeletal Muscle Actions 123

Terminology 125

Word Parts Used To Build Muscular System Terms 125
Adjective Forms of Anatomical Terms 126
Pathology 126
Diagnostic Procedures 129
Therapeutic Procedures 130
Pharmacology 130
Abbreviations 130

Chapter Review 132

Real-World Applications 132
Practice Exercises 135
Labeling Exercises 140



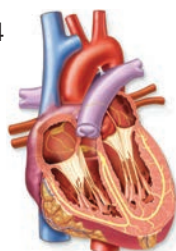
5 Cardiovascular System 143

Cardiovascular System at a Glance 144

Cardiovascular System Illustrated 145

Anatomy and Physiology of the Cardiovascular System 146

Heart 147
Blood Vessels 153



Terminology 157

Word Parts used to Build Cardiovascular System Terms 157
Adjective Forms of Anatomical Terms 158
Pathology 160
Diagnostic Procedures 167
Therapeutic Procedures 170
Pharmacology 172
Abbreviations 174

Chapter Review 176

Real-World Applications 176
Practice Exercises 179
Labeling Exercises 183

6 Blood and the Lymphatic and Immune Systems 185

Section I: Blood at a Glance 186

Blood Illustrated 187

Anatomy and Physiology of Blood 188

Plasma 188
Erythrocytes 188
Leukocytes 189
Platelets 189
Blood Typing 190

Terminology 191

Word Parts Used to Build Blood Terms 191
Adjective Forms of Anatomical Terms 192
Pathology 193
Diagnostic Procedures 197
Therapeutic Procedures 199
Pharmacology 199
Abbreviations 200

Section II: The Lymphatic And Immune Systems at a Glance 202

The Lymphatic and Immune Systems Illustrated 203

Anatomy and Physiology of the Lymphatic and Immune Systems 204

Lymphatic Vessels 204
Lymph Nodes 205
Tonsils 207
Spleen 207
Thymus Gland 207
Immunity 207

Terminology 210

Word Parts Used to Build Lymphatic And Immune System Terms 210



Adjective Forms of Anatomical Terms 211
 Pathology 211
 Diagnostic Procedures 216
 Therapeutic Procedures 217
 Pharmacology 218
 Abbreviations 219

Chapter Review 220

Real-World Applications 220
 Practice Exercises 223
 Labeling Exercises 228

7 Respiratory System 231

Respiratory System at a Glance 232

Respiratory System Illustrated 233

Anatomy and Physiology of the Respiratory System 234

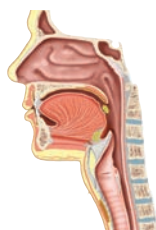
Nasal Cavity 234
 Pharynx 235
 Larynx 236
 Trachea 236
 Bronchial Tubes 237
 Lungs 238
 Lung Volumes and Capacities 239
 Respiratory Muscles 240
 Respiratory Rate 240

Terminology 241

Word Parts Used to Build Respiratory System Terms 241
 Adjective Forms of Anatomical Terms 243
 Pathology 244
 Diagnostic Procedures 253
 Therapeutic Procedures 255
 Pharmacology 259
 Abbreviations 260

Chapter Review 262

Real-World Applications 262
 Practice Exercises 265
 Labeling Exercises 270

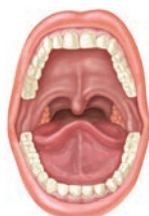


8 Digestive System 273

Digestive System at a Glance 274

Digestive System Illustrated 275

Anatomy and Physiology of the Digestive System 276



Oral Cavity 276
 Pharynx 280
 Esophagus 280
 Stomach 281
 Small Intestine 281
 Large Intestine 283
 Accessory Organs of the Digestive System 284

Terminology 286

Word Parts Used to Build Digestive System Terms 286
 Adjective Forms of Anatomical Terms 287
 Pathology 290
 Diagnostic Procedures 300
 Therapeutic Procedures 302
 Pharmacology 306
 Abbreviations 307

Chapter Review 309

Real-World Applications 309
 Practice Exercises 312
 Labeling Exercises 317

9 Urinary System 319

Urinary System at a Glance 320

Urinary System Illustrated 321

Anatomy and Physiology of the Urinary System 322

Kidneys 322
 Nephrons 323
 Ureters 323
 Urinary Bladder 324
 Urethra 325
 Role of Kidneys in Homeostasis 326
 Stages of Urine Production 326
 Urine 327

Terminology 328

Word Parts Used to Build Urinary System Terms 328
 Adjective Forms of Anatomical Terms 330
 Pathology 331
 Diagnostic Procedures 335
 Therapeutic Procedures 337
 Pharmacology 341
 Abbreviations 341

Chapter Review 343

Real-World Applications 343
 Practice Exercises 346
 Labeling Exercises 351



10 Reproductive System 353

Section I: Female Reproductive System at a Glance 354

Female Reproductive System Illustrated 355

Anatomy and Physiology of the Female Reproductive System 356

Internal Genitalia 356

Vulva 359

Breast 360

Pregnancy 361

Terminology 365

Word Parts Used to Build Female Reproductive System Terms 365

Adjective Forms of Anatomical Terms 366

Pregnancy Terms 367

Pathology 368

Diagnostic Procedures 374

Therapeutic Procedures 376

Pharmacology 380

Abbreviations 380

Section II: Male Reproductive System at a Glance 382

Male Reproductive System Illustrated 383

Anatomy and Physiology of the Male Reproductive System 384

External Organs of Reproduction 384

Internal Organs of Reproduction 385

Terminology 386

Word Parts Used to Build Male Reproductive System Terms 386

Adjective Forms of Anatomical Terms 387

Pathology 388

Diagnostic Procedures 392

Therapeutic Procedures 393

Pharmacology 395

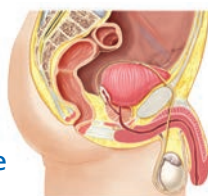
Abbreviations 395

Chapter Review 396

Real-World Applications 396

Practice Exercises 399

Labeling Exercises 405



11 Endocrine System 407

Endocrine System at a Glance 408

Endocrine System Illustrated 409

Anatomy and Physiology of the Endocrine System 410



Adrenal Glands 412

Ovaries 413

Pancreas 413

Parathyroid Glands 414

Pineal Gland 414

Pituitary Gland 415

Testes 417

Thymus Gland 417

Thyroid Gland 417

Terminology 419

Word Parts Used to Build Endocrine System Terms 419

Adjective Forms of Anatomical Terms 420

Pathology 421

Diagnostic Procedures 427

Therapeutic Procedures 428

Pharmacology 429

Abbreviations 430

Chapter Review 432

Real-World Applications 432

Practice Exercises 435

Labeling Exercises 439

12 Nervous System 441

Nervous System at a Glance 442

Nervous System Illustrated 443

Anatomy and Physiology of the Nervous System 444

Nervous Tissue 444

Central Nervous System 444

Peripheral Nervous System 449

Terminology 452

Word Parts Used to Build Nervous System Terms 452

Adjective Forms of Anatomical Terms 453

Pathology 454

Diagnostic Procedures 464

Therapeutic Procedures 466

Pharmacology 468

Abbreviations 469

Chapter Review 470

Real-World Applications 470

Practice Exercises 473

Labeling Exercises 479



13 Special Senses: The Eye and Ear 481

Section I: The Eye at a Glance 482

The Eye Illustrated 483

Anatomy and Physiology of the Eye 484

- The Eyeball 484
- Muscles of the Eye 486
- The Eyelids 487
- Conjunctiva 487
- Lacrimal Apparatus 487
- How Vision Works 487

Terminology 489

- Word Parts Used to Build Eye Terms 489
- Adjective Forms of Anatomical Terms 490
- Pathology 491
- Diagnostic Procedures 497
- Therapeutic Procedures 499
- Pharmacology 501
- Abbreviations 502

Section II: The Ear at a Glance 504

The Ear Illustrated 505

Anatomy and Physiology of the Ear 506

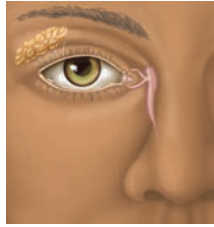
- External Ear 506
- Middle Ear 507
- Inner Ear 507
- How Hearing Works 508

Terminology 509

- Word Parts Used to Build Ear Terms 509
- Adjective Forms of Anatomical Terms 510
- Pathology 511
- Diagnostic Procedures 513
- Therapeutic Procedures 515
- Pharmacology 517
- Abbreviations 517

Chapter Review 518

- Real-World Applications 518
- Practice Exercises 521
- Labeling Exercises 526



14 Special Topics 527

Section I: Pharmacology at a Glance 528

Pharmacology 529

- Drug Names 529
- Legal Classification of Drugs 530
- How to Read a Prescription 531
- Routes and Methods of Drug Administration 533
- Pharmacology 535
- Abbreviations 536
- Symbols 537

Section II: Mental Health at a Glance 538

Mental Health Disciplines 539

- Psychology 539
- Psychiatry 540
- Pathology 540
- Therapeutic Procedures 544
- Abbreviations 546

Section III: Diagnostic Imaging at a Glance 547

Diagnostic Imaging 548

- Diagnostic Imaging Terms 548
- Diagnostic Imaging Procedures 549
- Abbreviations 553

Section IV: Rehabilitation Services at a Glance 554

Rehabilitation Services 555

- Physical Therapy 555
- Occupational Therapy 555
- Rehabilitation Services Terms 556
- Therapeutic Procedures 557
- Abbreviations 560

Section V: Surgery at a Glance 561

Surgery 562

- Anesthesia 563
- Surgical Instruments 563
- Surgical Positions 564
- Surgery Terms 566
- Abbreviations 567

Section VI: Oncology at a**Glance** 568**Oncology** 569

Staging Tumors 570

Oncology Terms 571

Diagnostic Procedures 572

Therapeutic Procedures 573

Abbreviations 574

Chapter Review 575

Real-World Applications 575

Practice Exercises 577

Appendices 583**Appendix I:** Word Parts Arranged Alphabetically and Defined 583**Appendix II:** Word Parts Arranged Alphabetically by Definition 589**Appendix III:** Abbreviations 595**Answer Keys** 604**Glossary/Index** 620

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Introduction to Medical Terminology



Learning Objectives: Upon completion of this chapter, you will be able to

1. Discuss the four parts of medical terms.
2. Recognize word roots and combining forms.
3. Identify the most common prefixes and suffixes.
4. Define word building and describe a strategy for translating medical terms.
5. State the importance of correct spelling of medical terms.
6. State the rules for determining singular and plural endings.
7. Discuss the importance of using caution with abbreviations.
8. Recognize the documents found in a medical record.
9. Recognize the different healthcare settings in the United States.
10. Understand the importance of confidentiality.

PROFESSIONAL PROFILE

Health Information Management

Health information management workers collect, organize, manage, and code health information in order to maintain accurate, orderly, and permanent digital and traditional records of each patient's condition and treatment.

Registered Health Information Administrator (RHIA)

- Employs a comprehensive knowledge of medical, administrative, ethical, and legal requirements and standards to direct the functioning of a health information department

Registered Health Information Technician (RHIT)

- Reviews patients' records for completeness, accuracy, and the proper entry into computer systems

Certified Coding Specialist (CCS)

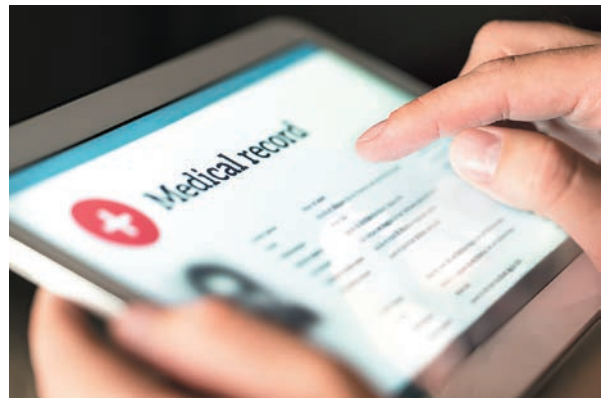
- Reviews patients' records in order to assign a universal numeric code for each diagnosis, procedure, and medical service a patient receives for the purpose of creating insurance claims.

Registered Healthcare Documentation Specialist (RHDS)

- Transcribes dictated medical notes

For more information regarding these health careers, visit the following websites:

- Association for Healthcare Documentation Integrity: www.ahdionline.org
- American Health Information Management Association: www.ahima.org



(Tero Vesalainen/123RF)

MEDICAL TERMINOLOGY

AT A GLANCE

Learning medical terminology can initially seem like studying a new language. However, once you understand some of the basic rules about how medical terms are formed using word building, it becomes much like piecing together a puzzle. This chapter discusses the general guidelines for forming words; an understanding of word roots, combining forms, prefixes, and suffixes; pronunciation; and spelling. Chapter 2 introduces you to terms that are used to describe the body as a whole. Chapters 3–13 each focus on a specific body system and present new combining forms, prefixes, and suffixes, as well as exercises to help you gain experience building new medical terms. Finally, Chapter 14 includes the terminology for several important areas of patient care. Additionally, sprinkled throughout all chapters are “Med Term Tips” to assist in clarifying some of the material, “Word Watch” boxes to point out terms that may be particularly confusing, “What’s in a Name?” boxes to highlight the word parts found in the text, and “Terminology Tidbit” boxes to explain how some terms were named. Key terms (with their pronunciations) are listed at the beginning of the section in which they are discussed, and each chapter contains numerous pathological, diagnostic, treatment, and surgical terms. Use these lists as an additional study tool for previewing and reviewing terms.

Understanding English-language medical terms requires being able to put words together or build words from their parts. It is impossible to memorize thousands of medical terms; however, once you understand the basics, you should be able to distinguish the meaning of many medical terms by analyzing their prefixes, suffixes, and word roots. Remember that there will always be some exceptions to every rule, and medical terminology is no different. We attempt to point out these exceptions where they exist. Most medical terms, however, do follow the general rule that there is a **word root** (indicated by a red color) or fundamental meaning for the word, a **prefix** (indicated by a green color) and a **suffix** (indicated by a blue color) that each modify the meaning of the word root, and sometimes a **combining vowel** to connect other word parts. People who are new to these strategies may be amazed at the seemingly difficult words that can be built and understood when the simple steps in word building are followed (refer to Figure 1-1 ■).



■ **Figure 1-1** Healthcare teams use medical terminology to accurately and efficiently communicate patient information to each other. (Shutterstock)

Building Medical Terms From Word Parts

Four different word parts or elements can be used to construct medical terms:

1. The **word root** is the foundation of the word.
cardi ogram = *record of the heart*
2. A **prefix** is at the beginning of the word.
peri cardium = *around the heart*
3. A **suffix** is at the end of the word.
card **itis** = *inflammation of the heart*
4. The **combining vowel** is a vowel (usually o) that links the word root to another word root or a suffix.
cardi **o** my **o** pathy = *disease of the heart muscle*

The following sections on word roots, combining vowels and forms, prefixes, and suffixes consider each of these word parts in more detail and present examples of some of those most commonly used.

Med Term Tip

Medical terms are built from word parts:

Word Part	Example (Meaning)
Word root	cardi (heart)
Prefix	peri- (around)
Suffix	-itis (inflammation)

When these components are put together, the word *pericarditis* is formed, meaning *inflammation around the heart*.

PRACTICE AS YOU GO

A. Complete the Statement

1. The four components of a medical term are _____, _____, _____, and _____.
2. The combination of a word root and the combining vowel is called a(n) _____.
3. The vowel that connects two word roots or a suffix with a word root is usually a(n) _____.
4. A word part used at the end of a word root to change the meaning of the word is called a(n) _____.
5. A(n) _____ is used at the beginning of a word to indicate number, location, or time.

Word Roots

The word root is the foundation of a medical term and provides the general meaning of the word. The word root often indicates the body system or part of the body being discussed, such as **cardi** for *heart*. At other times, the word root may be an action. For example, the word root **cis** means *to cut* (as in incision).

A term may have more than one word root. For example, **osteoarthritis** (oss-tee-oh-ar-THRY-tis) combines the word root **oste** meaning *bone* and **arthr** meaning *joint*. When the suffix **-itis**, meaning *inflammation*, is added, we have the entire word, meaning an *inflammation involving bone at a joint*.

Combining Vowel/Form

A combining vowel makes it possible to combine several word parts and simplifies pronunciation of long medical terms. This is most often the vowel *o*. Combining vowels are utilized in two places: between a word root and a suffix or between two word roots.

To decide whether or not to use a combining vowel between a word root and a suffix, first consider the suffix. If it begins with a vowel, do not use the combining vowel. If, however, the suffix begins with a consonant, then use a combining vowel. For example: To combine **arthr** with **-scope** will require a combining vowel: **arthroscope** (AR-throh-skohp). But to combine **arthr** with **-itis** does not require a combining vowel: **arthritis** (ar-THRY-tis).

The combining vowel is typically kept between two word roots, even if the second word root begins with a vowel. For example, in forming the term **gastroenteritis** (gas-troh-en-ter-EYE-tis), the combining vowel is kept between the two word roots **gastr** and **enter** (gastrenteritis is incorrect). As you may be able to tell from pronouncing these two terms, the combining vowel makes the pronunciation easier.

When writing a word root by itself, its **combining form** is typically used. This consists of the word root and its combining vowel written in a word root/vowel form, for example, **cardi/o**. Since it is often simpler to pronounce word roots when they appear in their combining form, this format is used throughout this book.

Med Term Tip

Remember to break down every word into its components (prefix, word root/combining form, and suffix) when learning medical terminology. Do not try to memorize every medical term. Instead, figure out how the word is formed from its components. In a short time, you will be able to do this automatically when encountering a new term.

Common Combining Forms

What follows are some commonly used word roots in their combining form, their meaning, and examples of their use. Review the examples to observe when a combining vowel was kept and when it was dropped according to the rules presented above.

COMBINING FORM	MEANING	EXAMPLE (DEFINITION)
bi/o	life	biology (study of life)
carcin/o	cancer	carcinoma (cancerous tumor)
cardi/o	heart	cardiac (pertaining to the heart)
chem/o	chemical	chemotherapy (treatment with chemicals)
cis/o	to cut	incision (process of cutting into)
dermat/o	skin	dermatology (study of the skin)
enter/o	small intestine	enteric (pertaining to the small intestine)
gastr/o	stomach	gastric (pertaining to the stomach)
gynec/o	female	gynecology (study of females)
hemat/o	blood	hematic (pertaining to the blood)
immun/o	protection	immunology (study of protection)
laryng/o	larynx	laryngeal (pertaining to the voice box)
nephr/o	kidney	nephromegaly (enlarged kidney)
neur/o	nerve	neural (pertaining to a nerve)
ophthalm/o	eye	ophthalmic (pertaining to the eye)
ot/o	ear	otic (pertaining to the ear)
path/o	disease	pathology (study of disease)
pulmon/o	lung	pulmonary (pertaining to the lungs)
rhin/o	nose	rhinoplasty (surgical repair of the nose)

PRACTICE AS YOU GO

B. Name That Term

Use the suffix **-logy** to write a term for each medical specialty.

1. heart _____
2. stomach _____
3. skin _____
4. eye _____
5. immunity _____
6. kidney _____
7. blood _____
8. female _____
9. nerve _____
10. disease _____

Prefixes

Adding a prefix to the front of a term forms a new medical word. Prefixes frequently provide information about the location of an organ, the number of parts, or time (frequency). For example, the prefix **bi-** stands for two of something, such as **bilateral** (bye-LAT-er-al), meaning *to have two sides*. However, not every term will have a prefix.

Common Prefixes

What follows are some of the more common prefixes, their meanings, and examples of their use. When written by themselves, prefixes are followed by a hyphen.

PREFIX	MEANING	EXAMPLE (DEFINITION)
a-	without	aphasia (without speech)
an-	without	anoxia (without oxygen)
anti-	against	antibiotic (against life)
auto-	self	autograft (a graft from one's own body)
brady-	slow	bradycardia (slow heartbeat)
de-	without	depigmentation (without pigment)
dis-	apart from	disease (apart from ease [health])
dys-	painful, difficult, abnormal	dysuria (painful urination); dyspnea (difficulty breathing); dystrophy (abnormal development)

Word Watch

Be extremely careful with pre-fixes; many have similar spellings but very different meanings. For example:

inter- means *between*; **intra-** means *within*

per- means *through*; **peri-** means *around*

re- means *again*; **retro-** means *backward, behind*

PREFIX	MEANING	EXAMPLE (DEFINITION)
endo-	within, inner	endoscope (instrument to view within); endocardium (inner lining of heart)
epi-	above	epigastric (above the stomach)
eu-	normal	eupnea (normal breathing)
ex-	outward	exostosis (condition of outward, or projecting, bone)
extra-	outside of	extracorporeal (outside of the body)
hetero-	different	heterograft (graft [like a skin graft] from a different species)
homo-	same	homograft (graft [like a skin graft] from the same species)
hyper-	excessive	hypertrophy (excessive development)
hypo-	below, insufficient	hypodermic (below the skin); hypoglycemia (insufficient blood sugar)
in-	not, inward	infertility (not fertile); inhalation (to breathe inward)
inter-	between	intervertebral (between the vertebrae)
intra-	within	intravenous (within a vein)
macro-	large	macrotia (having large ears)
micro-	small	microtia (having small ears)
neo-	new	neonatology (study of the newborn)
non-	not	nonsteroidal (not a steroid)
para-	beside, abnormal, two like parts of a pair	paranasal (beside the nose); paresthesia (abnormal sensation); paraplegia (paralysis of two like parts of a pair [the legs])
per-	through	percutaneous (through the skin)
peri-	around	pericardial (around the heart)
post-	after	postpartum (after birth)
pre-	before	preoperative (before a surgical operation)
pro-	before	prolactin (before milk)
pseudo-	false	pseudocyesis (false pregnancy)
re-	again	reinfection (to infect again)
retro-	backward, behind	retrograde (to move backward); retroperitoneal (behind the peritoneum)
sub-	under	subcutaneous (under the skin)
syn-	together	syndrome ([symptoms occurring] together)
tachy-	fast	tachycardia (fast heartbeat)
trans-	across	transurethral (across the urethra)
ultra-	beyond	ultrasound (beyond sound [high-frequency sound waves])
un-	not	unconscious (not conscious)

Number Prefixes

What follows are some common prefixes pertaining to the number of items or measurement, their meanings, and examples of their use.

PREFIX	MEANING	EXAMPLE (DEFINITION)
bi-	two	bilateral (two sides)
hemi-	half	hemiplegia (paralysis of one side/half of the body)
mono-	one	monoplegia (paralysis of one extremity)
multi-	many	multigravida (person with many [two or more] pregnancies)
nulli-	none	nulligravida (person with no [none] pregnancies)
pan-	all	pansinusitis (inflammation of all the sinuses)
poly-	many	polymyositis (inflammation of many muscles)
quadri-	four	quadriplegia (paralysis of all four limbs)
semi-	partial	semiconscious (partially conscious)
tetra-	four	tetraplegia (paralysis of all four limbs)
tri-	three	triceps (muscle with three heads)

PRACTICE AS YOU GO

C. Prefix Practice

Circle the prefixes in the following terms and then define them in the spaces provided.

1. tachycardia _____
2. pseudocyesis _____
3. hypoglycemia _____
4. intercostal _____
5. eupnea _____
6. postoperative _____
7. monoplegia _____
8. subcutaneous _____

Suffixes

A suffix is attached to the end of a word to add meaning, such as a condition, disease, or procedure. For example, the suffix **-itis**, meaning *inflammation*, when added to **cardi** forms the new word **carditis** (kar-DYE-tis), meaning *inflammation of the heart*. Every medical term *must* have a suffix. Most often the suffix is added

Med Term Tip

Remember, if a suffix begins with a vowel, the combining vowel is dropped; for example, *mastitis* rather than *mastoitis*.

to a word root, as in *carditis* above; however, terms can also be built from a suffix added directly to a prefix, without a word root. For example, the term **dystrophy** (DIS-troh-fee), meaning *abnormal development*, is built from the prefix **dys-** (meaning *abnormal*) and the suffix **-trophy** (meaning *development*).

Common Suffixes

What follows are some common suffixes, their meanings, and examples of their use. When written by themselves, suffixes are preceded by a hyphen.

SUFFIX	MEANING	EXAMPLE (DEFINITION)
-algia	pain	gastralgia (stomach pain)
-cele	protrusion	cystocele (protrusion of the bladder)
-cyte	cell	erythrocyte (red cell)
-dynia	pain	cardiodynia (heart pain)
-ectasis	dilation	bronchiectasis (dilated bronchi)
-gen	that which produces	pathogen (that which produces disease)
-genesis	produces	pathogenesis (produces disease)
-genic	producing	carcinogenic (cancer producing)
-ia	condition	bradycardia (condition of slow heart)
-iasis	abnormal condition	lithiasis (abnormal condition of stones)
-ism	state of	hypothyroidism (state of low thyroid)
-itis	inflammation	dermatitis (inflammation of skin)
-logical	pertaining to study of	pathological (pertaining to the study of disease)
-logist	one who studies	cardiologist (one who studies the heart)
-logy	study of	cardiology (study of the heart)
-lytic	destruction	thrombolytic (clot destruction)
-malacia	abnormal softening	chondromalacia (abnormal cartilage softening)
-megaly	enlarged	cardiomegaly (enlarged heart)
-oma	tumor, mass	carcinoma (cancerous tumor); hematoma (mass of blood)
-opsy	view of	biopsy (view of life)
-osis	abnormal condition	cyanosis (abnormal condition of being blue)
-pathy	disease	myopathy (muscle disease)
-plasm	formation	neoplasm (new formation)
-plegia	paralysis	laryngoplegia (paralysis of larynx)
-ptosis	drooping	blepharoptosis (drooping eyelid)
-rrhage	abnormal flow	hemorrhage (abnormal flow of blood)
-rrhagia	abnormal flow condition	cystorrhagia (condition of abnormal flow from the bladder)
-rrhea	discharge	rhinorrhea (discharge from the nose)
-rrhexis	rupture	hysterorrhexis (ruptured uterus)

SUFFIX	MEANING	EXAMPLE (DEFINITION)
-sclerosis	hardening	arteriosclerosis (hardening of an artery)
-stenosis	narrowing	angiostenosis (narrowing of a vessel)
-therapy	treatment	chemotherapy (treatment with chemicals)
-trophy	development	hypertrophy (excessive development)

Adjective Suffixes

The following suffixes are used to convert a word root into an adjective. Each of these suffixes is usually translated as *pertaining to*.

SUFFIX	MEANING	EXAMPLE (DEFINITION)
-ac	pertaining to	cardiac (pertaining to the heart)
-al	pertaining to	duodenal (pertaining to the duodenum)
-an	pertaining to	ovarian (pertaining to the ovary)
-ar	pertaining to	ventricular (pertaining to a ventricle)
-ary	pertaining to	pulmonary (pertaining to the lungs)
-atic	pertaining to	lymphatic (pertaining to lymph)
-eal	pertaining to	esophageal (pertaining to the esophagus)
-iac	pertaining to	chondriac (pertaining to cartilage)
-ic	pertaining to	gastric (pertaining to the stomach)
-ical	pertaining to	chemical (pertaining to a chemical)
-ile	pertaining to	penile (pertaining to the penis)
-ine	pertaining to	uterine (pertaining to the uterus)
-ior	pertaining to	superior (pertaining to above)
-nic	pertaining to	embryonic (pertaining to an embryo)
-ory	pertaining to	auditory (pertaining to hearing)
-ose	pertaining to	adipose (pertaining to fat)
-ous	pertaining to	intravenous (pertaining to within a vein)
-tic	pertaining to	acoustic (pertaining to hearing)

Surgical Suffixes

The following suffixes indicate surgical procedures.

SUFFIX	MEANING	EXAMPLE (DEFINITION)
-centesis	puncture to withdraw fluid	arthrocentesis (puncture to withdraw fluid from a joint)
-ectomy	surgical removal	gastrectomy (surgical removal of the stomach)
-ostomy	surgically create an opening	colostomy (surgically create an opening for the colon [through the abdominal wall])
-otomy	cutting into	thoracotomy (cutting into the chest)

Med Term Tip

Surgical suffixes have very specific meanings. The suffix **-otomy** is used to indicate that an organ or structure has been surgically opened up. In order to describe an organ that is surgically removed, then the suffix **-ectomy** is used. For example, a laparotomy (cutting into abdomen) is done in order to perform a gastrectomy (surgical removal of stomach).

SUFFIX	MEANING	EXAMPLE (DEFINITION)
-pexy	surgical fixation	nephropexy (surgical fixation of a kidney)
-plasty	surgical repair	dermatoplasty (surgical repair of the skin)
-rrhaphy	to suture	myorrhaphy (to suture together muscle)
-tome	instrument to cut	dermatome (instrument to cut skin)

Procedural Suffixes

The following suffixes indicate procedural processes or instruments.

SUFFIX	MEANING	EXAMPLE (DEFINITION)
-gram	record	electrocardiogram (record of heart's electricity)
-graphy	process of recording	electrocardiography (process of recording the heart's electrical activity)
-meter	instrument for measuring	audiometer (instrument for measuring hearing)
-metry	process of measuring	audiometry (process of measuring hearing)
-scope	instrument for viewing	gastroscope (instrument for viewing stomach)
-scopic	pertaining to visually examining	endoscopic (pertaining to visually examining within)
-scopy	process of visually examining	gastroscopy (process of visually examining the stomach)

PRACTICE AS YOU GO

D. Combining Form and Suffix Practice

Join a combining form and a suffix to build words with the following meanings.

- study of lungs _____
- nose discharge _____
- abnormal softening of a kidney _____
- enlarged heart _____
- cutting into the stomach _____
- inflammation of the skin _____
- surgical removal of the voice box _____
- surgical repair of a joint _____

Word Building

Word building consists of putting together two or more word elements to form a variety of terms. Prefixes and suffixes may be added to a combining form to create a new descriptive term. For example, adding the prefix **hypo-** (meaning *below* or *insufficient*) and the suffix **-ic** (meaning *pertaining to*) to the combining form **derm/o** (meaning *skin*) forms **hypodermic** (high-poh-DER-mik), which means *pertaining to below the skin*.

Interpreting Medical Terms

The following strategy is a reliable method for puzzling out the meaning of an unfamiliar medical term.

STEP

1. Divide the term into its word parts.
2. Define each word part.
3. Combine the meaning of the word parts.

EXAMPLE

gastr/o/enter/o/logy

gastr = stomach

o = combining vowel, no meaning

enter = small intestine

o = combining vowel, no meaning

-logy = study of

stomach, small intestine, study of

Med Term Tip

To gain a quick understanding of a term, it may be helpful for you to read from the end of the word (or the suffix) back to the beginning (or the prefix), and then pick up the word root. For example, *pericarditis* reads inflammation (**-itis**) around (**peri-**) the heart (**cardi/o**).

Pronunciation

You may hear different pronunciations for the same terms depending on where a person was born or educated. As long as it is clear which term people are discussing, differing pronunciations are acceptable. Some people are difficult to understand over the telephone or on a transcription tape. If you have any doubt about a term being discussed, ask for the term to be spelled. For example, it is often difficult to hear the difference between the terms **abduction** and **adduction**. However, since the terms refer to opposite directions of movement, it is very important to double-check if there is any question about which term is being used.

Each new term in this book is introduced in boldface type, with the phonetic or “sounds like” pronunciation in parentheses immediately following. The part of the word that should receive the greatest emphasis during pronunciation appears in capital letters, for example, **pericarditis** (pair-ih-kar-DYE-tis).

Spelling

Although you may hear differing pronunciations of the same term, there is only one correct spelling. If you have any doubt about the spelling of a term or of its meaning, always look it up in a medical dictionary. If only one letter of the word is changed, it can make a critical difference for the patient. For example, imagine the problem that could arise if you note for insurance purposes that a portion of a patient’s **ileum**, or small intestine, was removed when in reality he had surgery for removal of a piece of his **ilium**, or hipbone.

Med Term Tip

If you have any doubt about the meaning or spelling of a word, look it up in a medical dictionary. Even experienced medical personnel still need to look up a few words. It is never acceptable to “make up” your own spelling for a term.

Some words have the same beginning sounds but are spelled differently. Examples include:

Sounds like *si*

psy	psychiatry (sigh-KIGH-ah-tree)
cy	cytology (sigh-TALL-oh-jee)

Sounds like *dis*

dys	dyspepsia (dis-PEP-see-ah)
dis	dislocation (dis-loh-KAY-shun)

Singular and Plural Endings

Many medical terms originate from Greek and Latin words. The rules for forming the singular and plural forms of some words follow the rules of these languages rather than English. For example, the heart has a left atrium and a right atrium for a total of two *atria*, not two *atriums*. Other words, such as *virus* and *viruses*, are changed from singular to plural by following English rules. Each medical term needs to be considered individually when changing from the singular to the plural form. The following examples illustrate how terms that follow Greek and Latin rules are pluralized. Throughout the book, unusual or unexpected plural forms will be included with the term definition.

WORDS ENDING IN	SINGULAR	PLURAL
-a	vertebra	vertebrae
-ax	thorax	thoraces
-ex or -ix	appendix	appendices
-is	metastasis	metastases
	epididymis	epididymides
-ma	sarcoma	sarcomata
-nx	phalanx	phalanges
-on	ganglion	ganglia
-um	ovum	ova
-us	nucleus	nuclei
-y	biopsy	biopsies

PRACTICE AS YOU GO

E. Make It Plural

Change the following singular terms to plural terms.

- metastasis _____
- ovum _____
- nucleus _____
- phalanx _____
- appendix _____
- vertebra _____

Abbreviations

Abbreviations are commonly used in the medical profession as a way of saving time. However, some abbreviations can be confusing, such as *SM* for simple mastectomy and *sm* for small. Using incorrect abbreviations can result in problems for a patient, as well as with insurance records and processing. If you have any concern that you will confuse someone by using an abbreviation, spell out the word instead. It is never acceptable to use made-up abbreviations. All types of formal healthcare facilities in the United States will have a list of approved abbreviations, and it is extremely important that you become familiar with this list and follow it closely. Throughout this book abbreviations are included, when possible, immediately following terms. Additionally, a list of common abbreviations for each body system is provided in each chapter. Finally, Appendix III offers a complete alphabetical listing of all the abbreviations used in this text.

The Medical Record

The **medical record** or chart documents the details of a patient's hospital stay. Each healthcare professional that has contact with the patient in any capacity completes the appropriate report of that contact and adds it to the medical chart. This results in a permanent physical record of the patient's day-to-day condition, when and what services were received, and the response to treatment. Each institution adopts a specific format for each document and its location within the chart. This is necessary because each healthcare professional must be able to locate quickly and efficiently the information needed in order to provide proper care for the patient. The medical record is also a legal document. Therefore, it is essential that all chart components be completely filled out and signed. Each page must contain the proper patient identification information; that is, information that is directly associated with the patient that reliably identifies the individual. Examples of acceptable identifiers include the person's name, date of birth, or assigned identification number (e.g., a medical record number).

While the patient is still in the hospital, a unit clerk is usually responsible for placing documents in the proper place. After discharge, the medical records department ensures that all documents are present, complete, signed, and in the correct order. If a person is readmitted, especially for the same diagnosis, parts of this previous chart can be pulled and added to the current chart for reference (refer to Figure 1-2 ■). Physicians' offices and other outpatient care providers such as clinics and therapists also maintain a medical record detailing each patient's visit to their facility.



■ **Figure 1-2** Health information professionals maintain accurate, orderly, and permanent patient records. Medical records are stored securely and are available for future reference. (B. Franklin/Shutterstock)

The digital revolution has also impacted healthcare with the increasing use of the **electronic medical record (EMR)**. A software program allows for entering of patient information via a computer or tablet, which then organizes and stores the data. Information is entered either at a centralized workstation or by using mobile devices at the point of care. Once digitally stored, the information may be analyzed and monitored to detect and prevent potential errors. Since the records are digitally stored, they can be accessed and shared between healthcare providers easily, which reduces unnecessary repetition of tests and inadvertent medication errors. Table 1-1 ■ includes the most common elements of a hospital inpatient chart with a brief description.

■ **TABLE 1-1** Elements of the Medical Record

Component	Description
History and Physical	Written or dictated by admitting physician; details patient's history, results of physician's examination, initial diagnoses, and physician's plan of treatment
Physician's Orders	Complete list of care, medications, tests, and treatments physician orders for patient
Nurse's Notes	Record of patient's care throughout the day; includes vital signs, treatment specifics, patient's response to treatment, and patient's condition
Physician's Progress Notes	Physician's daily record of patient's condition, results of physician's examinations, summary of test results, updated assessment and diagnoses, and further plans for patient's care
Consultation Reports	Reports given by specialists whom physician has asked to evaluate patient
Ancillary Reports	Reports from various treatments and therapies patient has received, such as rehabilitation, social services, or respiratory therapy
Diagnostic Reports	Results of diagnostic tests performed on patient, principally from a clinical lab (e.g., blood tests) and medical imaging (e.g., X-rays and ultrasound)
Informed Consent	Document voluntarily signed by patient (or a responsible party) that clearly describes purpose, methods, procedures, benefits, and risks of a diagnostic or treatment procedure
Operative Report	Report from surgeon detailing an operation; includes pre- and postoperative diagnosis, specific details of surgical procedure itself, and how patient tolerated procedure
Anesthesiologist's Report	Relates details regarding substances (such as medications and fluids) given to patient, patient's response to anesthesia, and vital signs during surgery
Pathologist's Report	Report given by pathologist who studies tissue removed from patient (e.g., bone marrow, blood, or tissue biopsy)
Discharge Summary	Comprehensive outline of patient's entire hospital stay; includes condition at time of admission, admitting diagnosis, test results, treatments and patient's response, final diagnosis, and follow-up plans

PRACTICE AS YOU GO

F. Medical Records Matching

Match each definition to its medical record element.

- | | |
|-------------------------------|---|
| _____ 1. Physician's Orders | a. written after patient care is completed |
| _____ 2. Discharge Summary | b. includes vital signs |
| _____ 3. Ancillary Reports | c. lists medications to be given to patient |
| _____ 4. Consultation Reports | d. written by specialists |
| _____ 5. Nurse's Notes | e. location of rehabilitation reports |

Healthcare Settings

The use of medical terminology is widespread. It provides healthcare professionals with a precise and efficient method of communicating very specific patient information to one another, regardless of whether they are in the same type of facility (refer to Figure 1-3 ■). Table 1-2 ■ presents descriptions of the different types of settings where medical terminology is used.



■ **Figure 1-3** Healthcare team discussing plan for patient care.
(M_Agency/Shutterstock)

■ **TABLE 1-2** Healthcare Settings

Healthcare Setting	Description
Acute Care or General Hospitals	Provide services to diagnose (laboratory, diagnostic imaging) and treat (surgery, medications, therapy) diseases for a short period of time; in addition, usually provide emergency and obstetrical care
Specialty Care Hospitals	Provide care for very specific types of diseases (e.g., psychiatric hospital)
Nursing Homes or Long-Term Care Facilities	Provide long-term care for patients needing extra time to recover from illness or injury before returning home, or for persons who can no longer care for themselves
Urgent Care Centers	Walk-in clinics that provide immediately needed care not requiring services of emergency department; often used by persons who cannot get appointment at primary care physician's office or who do not have a primary care physician
Ambulatory Care Centers, Surgical Centers, or Outpatient Clinics	Provide services not requiring overnight hospitalization; services range from simple surgeries to diagnostic testing or various treatments
Physicians' Offices	Provide diagnostic and treatment services in a private office setting
Health Maintenance Organization (HMO)	Provides wide range of services by a group of primary care physicians, specialists, and other healthcare professionals in a prepaid system
Home Health Care	Provides nursing, therapy, personal care, or housekeeping services in patient's own home
Rehabilitation Centers	Provide intensive physical and occupational therapy; includes inpatient and outpatient treatment
Hospices	Provide supportive treatment to terminally ill patients and their families

PRACTICE AS YOU GO

G. Healthcare Settings

Match each setting listed on the left with a setting listed on the right that provides similar services.

- | | |
|----------------------------------|---------------------------|
| _____ 1. long-term care facility | a. ambulatory care center |
| _____ 2. outpatient clinic | b. general hospital |
| _____ 3. acute care hospital | c. nursing home |

Confidentiality

Anyone working with medical terminology and involved in the medical profession must have a firm understanding of confidentiality. Any information or record relating to a patient must be considered privileged. This means that there is a moral and legal responsibility to keep all information about the patient confidential. If there is a request to supply documentation relating to a patient, the proper authorization form must be signed by that patient. Give only the specific information that the patient has authorized. The Health Insurance Portability and Accountability Act of 1996 (HIPAA) set federal standards providing patients with more protection of their medical records and health information, better access to their own records, and greater control over how their health information is used and to whom it is disclosed.

Chapter Review

PRACTICE EXERCISES

A. Terminology Matching

Match each definition to its term.

- | | |
|---|-------------------------------|
| 1. _____ Provides services for a short period of time | a. Rehabilitation Center |
| 2. _____ Complete outline of a patient's entire hospital stay | b. Nurse's Notes |
| 3. _____ Describes purpose, methods, benefits, and risks of procedure | c. Ancillary Report |
| 4. _____ Contains updated assessment, diagnoses, and further plans for care | d. Hospice |
| 5. _____ Provides supportive care to terminally ill patients and families | e. Discharge Summary |
| 6. _____ Written by the admitting physician | f. Physician's Progress Notes |
| 7. _____ Reports results from study of tissue removed from the patient | g. Ambulatory Care Center |
| 8. _____ Written by the surgeon | h. Diagnostic Report |
| 9. _____ Provides services not requiring overnight hospital stay | i. Long-term Care Facility |
| 10. _____ Report given by a specialist | j. Informed Consent |
| 11. _____ Record of a patient's care throughout the day | k. History and Physical |
| 12. _____ Clinical lab and medical imaging reports | l. Acute Care Hospital |
| 13. _____ Provides intensive physical and occupational therapy | m. Pathologist's Report |
| 14. _____ Report of treatment/therapy the patient received | n. Consultation Report |
| 15. _____ Provides care for patients who need more time to recover | o. Operative Report |

B. Prefix Practice

The prefix has been underlined in each term below. Fill in the blank in the term's definition with the meaning of that prefix.

- | Term | Definition |
|----------------------------|-----------------------------------|
| 1. <u>a</u> phasia | _____ speech |
| 2. <u>brad</u> ycardia | _____ heartbeat |
| 3. <u>an</u> oxia | _____ oxygen |
| 4. <u>eup</u> nea | _____ breathing |
| 5. <u>hypert</u> rophy | _____ development |
| 6. <u>inter</u> vertebral | pertaining to _____ the vertebrae |
| 7. <u>pre</u> operative | _____ an operation |
| 8. <u>sub</u> cutaneous | pertaining to _____ the skin |
| 9. <u>un</u> conscious | _____ conscious |
| 10. <u>polymy</u> ositis | inflammation of _____ muscles |
| 11. <u>intra</u> venous | pertaining to _____ a vein |
| 12. <u>extra</u> corporeal | pertaining to _____ of the body |

Term	Definition
13. <u>bi</u> lateral	pertaining to _____ sides
14. <u>pan</u> sinusitis	inflammation of _____ the sinuses
15. <u>epi</u> gastric	pertaining to _____ the stomach
16. <u>anti</u> biotic	pertaining to _____ life
17. <u>tachy</u> cardia	_____ heartbeat
18. <u>hypo</u> glycemia	_____ blood sugar
19. <u>percu</u> taneous	pertaining to _____ the skin
20. <u>peri</u> cardial	pertaining to _____ the heart

C. Suffix Practice

The suffix has been underlined in each term below. Fill in the blank in the term's definition with the meaning of that suffix.

Term	Definition
1. cardi <u>ology</u>	_____ the heart
2. laryng <u>oplegia</u>	_____ of the larynx
3. rhin <u>orrhea</u>	_____ from the nose
4. angio <u>stenosis</u>	_____ of a vessel
5. chemo <u>therapy</u>	_____ with chemicals
6. duoden <u>al</u>	_____ the duodenum
7. patho <u>gen</u>	_____ disease
8. thrombo <u>lytic</u>	clot _____
9. biops <u>y</u>	_____ life
10. gastro <u>rectomy</u>	_____ of the stomach
11. arterio <u>sclerosis</u>	_____ of an artery
12. uter <u>ine</u>	_____ the uterus
13. gastro <u>algia</u>	stomach _____
14. nephro <u>pexy</u>	_____ of a kidney
15. audiomet <u>ry</u>	_____ hearing
16. acoust <u>ic</u>	_____ hearing
17. dermato <u>plasty</u>	_____ of the skin
18. thoraco <u>tomy</u>	_____ the chest
19. gastro <u>scope</u>	_____ the stomach
20. cardio <u>ac</u>	_____ the heart

D. Building Medical Terms

Build a medical term by combining the word parts requested in each question.

For example, use the combining form for *spleen* with the suffix meaning *enlargement* to form a word meaning *enlargement of the spleen* (answer: *splenomegaly*).

1. combining form for *heart* _____
 suffix meaning *abnormal softening* _____ } term meaning *abnormal softening of the heart*
2. word root form for *stomach* _____
 suffix meaning *to surgically create an opening* _____ } term meaning *surgically creating an opening into the stomach*
3. combining form for *nose* _____
 suffix meaning *surgical repair* _____ } term meaning *surgical repair of the nose*
4. prefix meaning *excessive* _____
 suffix meaning *development* _____ } term meaning *excessive development*
5. combining form meaning *disease* _____
 suffix meaning *the study of* _____ } term meaning *the study of disease*
6. word root meaning *nerve* _____
 suffix for *tumor/mass* _____ } term meaning *nerve tumor*
7. combining form meaning *stomach* _____
 combining form meaning *small intestine* _____
 suffix meaning *study of* _____ } term meaning *study of stomach and small intestine*
8. word root meaning *ear* _____
 suffix meaning *inflammation* _____ } term meaning *ear inflammation*
9. prefix meaning *chemical* _____
 suffix meaning *treatment* _____ } term meaning *chemical treatment*
10. combining form meaning *cancer* _____
 suffix meaning *that which produces* _____ } term meaning *that which produces cancer*

E. Define the Combining Form

1. **bi/o** _____
2. **carcin/o** _____
3. **cardi/o** _____

4. **chem/o** _____
5. **cis/o** _____
6. **dermat/o** _____
7. **enter/o** _____
8. **gastr/o** _____
9. **gynec/o** _____
10. **hemat/o** _____
11. **immun/o** _____
12. **laryng/o** _____
13. **nephr/o** _____
14. **neur/o** _____
15. **ophthalm/o** _____
16. **ot/o** _____
17. **path/o** _____
18. **pulmon/o** _____
19. **rhin/o** _____

F. Making Plurals

For each singular term below, write the plural form.

1. diagnosis _____
2. diverticulum _____
3. bursa _____
4. bronchus _____
5. artery _____

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Body Organization and Medical Care



Learning Objectives: Upon completion of this chapter, you will be able to

1. Recognize the combining forms introduced in this chapter.
2. Correctly spell and pronounce medical terms and anatomical structures relating to body structure.
3. Discuss the organization of the body in terms of cells, tissues, organs, and systems.
4. Describe the common features of cells.
5. Define the four types of tissues.
6. List the major organs found in the 12 organ systems and their related medical specialties.
7. Describe the anatomical position.
8. Define the body planes.
9. Identify regions of the body.
10. List the body cavities and their contents.
11. Locate and describe the nine anatomical and four clinical divisions of the abdomen.
12. Define directional terms.
13. Build body organization and medical care terms from word parts.
14. Distinguish between the different aspects of medical care.
15. Interpret abbreviations associated with body organization and medical care.

PROFESSIONAL PROFILE

Medical Care

Medical care includes examining patients, diagnosing diseases, conditions or injuries, ordering or providing treatments, writing prescriptions, performing surgery, and educating patients on health issues.

Doctor of Medicine (MD)

- Oversees all aspects of patient care

Doctor of Osteopathy (DO)

- Practices medicine that emphasizes the role of the musculoskeletal system in health

Physician Assistant (PA)

- Performs many of the tasks of a doctor in conjunction with a physician

Certified Medical Assistant (CMA)

- Duties include record keeping, billing, preparing insurance forms, taking patients' vital signs, and stocking exam rooms

For more information regarding these health careers, visit the following websites:

- Association of American Medical Colleges: www.aamc.org
- American Association of Colleges of Osteopathic Medicine: www.aacom.org
- American Academy of Physician Assistants: www.aapa.org
- American Association of Medical Assistants: www.aama-ntl.org



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