

Medical Terminology for Medical Assistants Part I: Introduction to Medical Terminology

Objectives

At the end of this module, the learner will be able to:

- Identify the four types of word parts and their roles for the formation of medical terms
- Apply word part knowledge to new medical terms
- Define prefixes, suffixes, word roots, and combining forms
- Define, pronounce, spell, and identify the key medical terms for this module
- Identify and describe process for locating medical terms in a dictionary

Start With the Word Parts

Medical terms are formed with one or all of the word parts: prefixes, suffixes, word roots, and combining forms.

Prefixes often indicate the location, time, number, or status of the term. A prefix is always at the beginning of the word.

Suffixes often indicate the condition, procedure, disease, or disorder. A suffix always comes at the end of a word.

Word roots contain the basis from which medical terms are formed and usually indicate the body part.

Combining forms involve the word roots with a vowel at the end in order to add a suffix which begins with a consonant.

Prefixes	Meaning	Example
a-	without	asepsis [ā-SĔP-sĭs], without living organisms
ab-, abs-	away from (opposite of ad)	abduct [ăb-DŪKT], to draw away from a position
ad-	toward, to (opposite of ab)	adduct [ă-DŪKT], to draw toward the body, as a limb
ambi-	both, around	ambidextrous [ăm-bē-DEKS-trŭs], having ability on both the right and left sides (said of the hands)
ante-	before	antemortem [ĂN-tē-mŏr-tēm], before death

Prefixes	Meaning	Example
anti-	against	antibacterial [ǺN-tē-bāk-TĒR-ē-ǻ], preventing the growth of bacteria
dys-	abnormal; difficult (opposite of eu)	dysfunctional [dĭs-FŪNK-shŭn-ǻ], functioning abnormally
end-	within	endoabdominal [ĒN-dō-ǻb-DŌM-ĭ-nǻ], within the abdomen
epi-	over	epicondyle [ĕp-ĭ-KŌn-dĭl], projection over or near the condyle
eu-	well, good, normal (opposite of dys)	eupepsia [yŭ-PĒP-sē-ǻ], normal digestion
ex-	out of, away from	exhale [ĔXS-hāl], breath out
exo-	external, on the outside	exogenous [ĕks-ŌJ-ĕ-nŭs], produced outside of the organism
hemi-	half	hemiplegia [hĕm-ĭ-PLĒ-jē-ǻ], paralysis on one side of the body
hyper-	above normal; overly (opposite hypo)	hyperactive [hĭ-pĕr-ĀK-tĭv], abnormally restless and inattentive
hypo-	below normal (opposite of hyper)	hypoglycemia [hĭ-pō-glĭ-Sē-mē-ǻ], low blood sugar
inter-	between (don't confuse with intra)	interdental [ĭn-tĕr-DĒN-tǻ], between the teeth
intra-	within (don't confuse with inter)	intramuscular [ĭN-trǻ-MŪS-kyŭ-lār], within the substance of the muscles
iso-	equal, same	isometric [i-sō-MĒT-rĭk], of the same dimensions
mal-	bad; inadequate	malabsorption [mǻ-ǻb-SŌRP-shŭn], inadequate absorption
meg(a)-, megal(o)	large	megacephaly [mĕg-ǻ-SĒF-ǻ-lē], abnormal enlargement of the head

Prefixes	Meaning	Example
mes-	middle, median	mesoderm [MĚS-ō-dĕrm], the middle layer of skin
meta-	after	metacarpus [MĚT-ă-ĀR-pŭs], bones attached to the carpus
micr(o)-	small, microscopic	microplasia [Mī-krō-PLĀ-zhĕ-ă], stunted growth, as in dwarfism
mon(o)-	single	monomania [mŏn-ō-MĀ-nĕ-ă], obsession with a single thought or idea
multi-	many	multiarticular [MŪL-tĕ-ăr-TĪK-yŭ-lăr], involving many joints
pan-, pant(o)-	all, entire	panarthritis [păn-ăr-THRĪ-tĭs], arthritis involving all joints
per-	through, intensely	peraxillary [pĕr-ĀK-sĭ-lăr-ĕ], through the axilla
peri-	around, about, near	periappendicitis [PĚR-ĕ-a-pĕn-dĭ-SĪ-tĭs], inflammation of the tissue surrounding the appendix
poly-	many	polyarteritis [pŏl-ĕ-ăr-tĕr-Ī-tĭs], inflammation of a number of arteries
post-	after, following	postmortem [pŏst-MŌR-tĕm], after death
pre-	before	prenatal [prĕ-NĀ-tăl], before birth
pro-	before, forward	prodrome [PRŌ-drŏm], a symptom or group of symptoms that occurs before a disease shows up
sub-	less than, under, inferior (opposite of super)	subcutaneous [sŭb-kyŭ-TĀ-nĕ-ŭs]; beneath the skin
super-	more than, above, superior (opposite of sub)	superacute [sŭ-pĕr-ă-KYŪT], more acute

Prefixes	Meaning	Example
supra-	above, over	supramaxillary [sŭ-pră-MĂK-sì-lăr-ē], above the maxilla
tachy-	fast	tachycardia [TĂK-i-KAR-de-a], rapid heartbeat

Suffixes	Meaning	Example
-ad	toward	cephalad [SĚF-ā-lād], toward the head
-algia	pain	neuralgia [nūr-ās-THĚ-ně-ā], condition with vague symptoms, such as weakness
-crine	secreting	endocrine [ĚN-dō-krīn], gland that secretes hormones into the bloodstream
-cyte	cell	Thrombocyte [THRŌM-bō-sīt], blood platelet
-cytosis	condition of cells	Erythrocytosis [ě-RĪTH-rō-sī-tō-sīs], condition with an abnormal number of red blood cells in the blood
-derma	condition of cells	scleroderma [sklē-r-ō-DĚR-mā], hardening of the skin
-dynia	pain	neurodynia [nūr-ō-DĪN-ā], nerve pain
-ectasia	expansion, dilation	neurectasia [nūr-ěk-TĀ-zhē-ā], operation with dilation of a nerve
-ectomy	removal of	appendectomy [āp-ěn-DĚK-tō-mē], removal of obstructed lymph nodes
-edema	swelling	lymphedema [līm-f-ěDĚ-mā], swelling as a result of obstructed lymph nodes
-ema	condition	empyema [ěm-pī-Ě-mā], pus in a body cavity
-emesis	vomiting	Hematemesis [hē-mā-TEM-ě-sīs], vomiting of blood
-emia	blood	uremia [yū-RĚ-mē-ā], excess urea in the blood
-emic	relating to blood	uremic [yū-RĚ-mīk], having excess urea in the blood
-gram	a recording	encephalogram [ěn-SĚF-ā-lō-grām], brain scan

Suffixes	Meaning	Example
-graph	recording instrument	encephalograph [ěn-SĚF-ă-lō-grăf], instrument for measuring brain activity
-graphy	process of recording	echocardiography [ĚK-ō-kăr-dĕ-ŮG-ră-fĕ], use of ultrasound to examine the heart
-ic	pertaining to	gastric [GĀS-trĭk], relating to the stomach
-itis (pl.,-itides)	inflammation	nephritis [ně-FRĪ-tĭs], kidney inflammation; neuritides [nū-RĪT-ĭ-dĕz], inflammations of nerves
-kinesis	movement	hyperkinesis [hĭ-pĕr-kĭ-NĚ-sĭs], excessive muscular movement
-logist	one who practices	dermatologist [dĕr-mă-TŎL-ō-jĭst], one who practices dermatology
-logy	study, practice	dermatology [dĕr-mă-TŎL-ō-jĕ], study and treatment of skin disorders
-megaly	enlargement	cephalomegaly [SĚF-ă-lō-MĚG-ă-lĕ], abnormal enlargement of the head
-meter	measuring device	ophthalmometer [ŏf-thăl-ŮM-ĕ-tĕr], device for measuring cornea curvature
-metry	measurement	optometry [ŏp-TŎM-ĕ-trĕ], specialty concerned with measurement of eye function
-opsy	view of	biopsy [BĪ-ŏp-sĕ], cutting from living tissue to be viewed
-ostomy	opening	colostomy [kō-LŎS-tō-mĕ], surgical opening in the colon
-pathy	disease	osteopathy [ŏs-tĕ-ŮP-ă-thĕ], bone disease
-pepsia	digestion	dyspepsia [dĭs-PĚP-sĕ-ă], impaired digestion
-pexy	fixation, usually done surgically	nephropexy [NĚF-rō-pĕk-sĕ], surgical fixation of a floating kidney

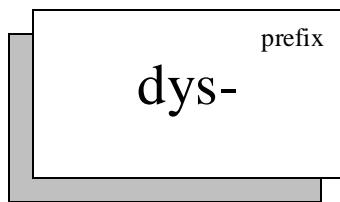
Suffixes	Meaning	Example
-phobia	fear	acrophobia [āk-rō-FŌ-bē-ă], fear of heights
-plasty	surgical repair	rhinoplasty [RĪ-nō-plās-tē], plastic surgery of the nose
-plegia	paralysis	quadriplegia [KWĀH-drī-PLĒ-jē-ă], paralysis of all four limbs
-rrhage	discharging heavily	hemorrhage [HĒM-ō-răj], to bleed profusely
-rrhagia	heavy discharge	tracheorrhagia [trā-kē-ō-RĀ-jē-ă], hemorrhage from the trachea
-rrhaphy	surgical suturing	herniorrhaphy [HĒR-ně-ŌR-ă-fē], surgical repair of a hernia
-rrhea	a flowing, a flux	dysmenorrheal [dīs-měn-ŌR-ē-ă], difficult menstrual flow
-rrhexis	rupture	cardiorrhexis [kār-dě-ō-RĒK-sīs], rupture of the heart wall
-scope	instrument (especially one used for observing or measuring)	microscope [MĪ-krō-skōp], instrument for viewing small objects
-scopy	use of an instrument for observing	microscopy [mī-KRŌS-kō-pē], use of microscopes
-stenosis	narrowing	stenostenosis [STĒN-ō-stě-NŌ-sīs], narrowing of the parotid duct
-stomy	opening	colostomy [kō-LŌS-tō-mē], surgical opening in the colon
-tomy	cutting operation	laparotomy [LĀP-ă-RŌT-ō-mē], incision in the abdomen

HOMEWORK

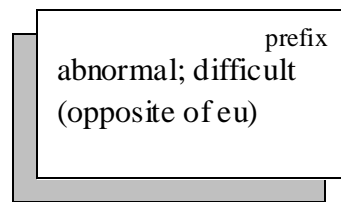
Make Flash cards

Take 3" x 5" index cards and write the Prefix on one side and the meaning on the other to aid you in memorizing these important word parts.
Repeat the above process for Suffixes.

See sample Flash Card below:



front



back

Study the following chart of med terms for in-class bingo:

Medical Word Part Bingo Caller's List

- | | |
|---|---|
| <input type="checkbox"/> -AL = pertaining to | <input type="checkbox"/> MY/O = muscle |
| <input type="checkbox"/> -ALGIA = pain and suffering | <input type="checkbox"/> -NECROSIS = the death of tissue |
| <input type="checkbox"/> APPENDIC/O = appendix | <input type="checkbox"/> NEPHR/O = kidney |
| <input type="checkbox"/> ARTERI/O = artery | <input type="checkbox"/> NEUR/O = nerve |
| <input type="checkbox"/> ARTHRO/O = joint | <input type="checkbox"/> -OLOGIST = specialist |
| <input type="checkbox"/> ATHER/O = plaque or fatty substance | <input type="checkbox"/> -OLOGY = study of |
| <input type="checkbox"/> CARDIO = heart | <input type="checkbox"/> -OSIS = a disease or abnormal condition |
| <input type="checkbox"/> CHONDR/O = cartilage | <input type="checkbox"/> OSTE/O = bone |
| <input type="checkbox"/> COL/O = colon | <input type="checkbox"/> OT/O = ear |
| <input type="checkbox"/> -DYNIA = pain | <input type="checkbox"/> -OTOMY = a surgical incision |
| <input type="checkbox"/> DYS- = difficult, painful or bad | <input type="checkbox"/> -PATHY = disease |
| <input type="checkbox"/> -ECTOMY = surgical removal | <input type="checkbox"/> PERI- = surrounding |
| <input type="checkbox"/> ENTER/O = small intestine | <input type="checkbox"/> -PLASTY = surgical repair |
| <input type="checkbox"/> GASTR/O = stomach | <input type="checkbox"/> POLY- = many |
| <input type="checkbox"/> -GRAPHY = recording a picture | <input type="checkbox"/> PY/O = pus |
| <input type="checkbox"/> HEM/O = relating to blood | <input type="checkbox"/> RHIN/O = nose |
| <input type="checkbox"/> HYPHER- = over, above, or increased | <input type="checkbox"/> -RRHAGE = abnormal or excessive flow |
| <input type="checkbox"/> HYPHO- = below, under, or decreased | <input type="checkbox"/> -RRHAPHY = to suture or stitch |
| <input type="checkbox"/> -IC = pertaining to | <input type="checkbox"/> -RRHEA = flow or discharge |
| <input type="checkbox"/> -ITIS = inflammation | <input type="checkbox"/> -RRHEXIS = rupture |
| <input type="checkbox"/> LARYNG/O = larynx | <input type="checkbox"/> -SCLEROSIS = abnormal hardening |
| <input type="checkbox"/> -MALACIA = abnormal softening | <input type="checkbox"/> -SCOPY = visual examination |
| <input type="checkbox"/> -MEGALY = large or enlargement | <input type="checkbox"/> -STENOSIS = abnormal narrowing |
| <input type="checkbox"/> MYC/O = fungus | <input type="checkbox"/> SUB- = under, less, or below |
| <input type="checkbox"/> MYEL/O = spinal cord or bone marrow | <input type="checkbox"/> SUPRA- = above, excessive, or beyond |

Combining Forms and Suffixes to Create Medical Terms

Remember that vowels are added to combining forms when the suffix begins with a consonant.

Let's take **arteri/o** (which means artery) and combine with different suffixes to form a variety of medical terms, all related to the conditions of the arteries.

arteri/o (artery) + **malachia** (which means abnormal softening)

arteriomalachia (ar-tee-ree-oh-mah-LAY-shee-ah), the abnormal softening of the walls of an artery or arteries

arteri/o (artery) + **sclerosis** (abnormal hardening)

arteriosclerosis (ar-tee-ree-oh-skleh-ROH-sis), the abnormal hardening of the walls of an artery or arteries

arteri/o (artery) + **stenosis** (abnormal narrowing)

arteriosclerosis (ar-tee-ree-oh-skleh-ROH-sis), the abnormal narrowing of an artery or arteries

arteri/o (artery) + **necrosis** (tissue death)

arterionecrosis (ar-tee-ree-oh-neh-KROH-sis), the tissue death of an artery or arteries

Now let's take **gastr/o** (which means stomach) and combine with different suffixes to form a variety of medical terms, all related to the conditions of the stomach.

gastr/o (stomach) + **osis** (which means abnormal condition)

gastrosis (gas-TROH-sis), abnormal condition or disease of the stomach

gastr/o (stomach) + **algia** (pain and suffering)

gastralgia (gas-TRAL-jee-ah), pain in the stomach

gastr/o (stomach) + **dynia** (which also means pain)

gastrodynia (gas-troh-DIN-ee-ah), pain in the stomach

gastr/o (stomach) + **itis** (inflammation)

gastritis (gas-TRY-tis), inflammation of the stomach

Some Easily Confused Terms

myc/o, myel/o, and my/o

myc/o (fungus) + **-osis** (abnormal condition)

mycosis (my-**KOH**-sis), any disease caused by a fungus

mye/o (bone marrow or spinal cord), + **-pathy** (disease)

myelopathy (my-eh-**LOP**-ah-thee), pathological change or disease in spinal cord or bone marrow

my/o (muscle) + **-pathy** (disease)

myopathy (my-**OP**-ah-thee), pathological change or disease of muscle tissue

A **laceration** (**lass**-er-**AY**-shun) is a torn, ragged wound.

A **lesion** (**LEE**-zhun) is a pathologic change of the tissues due to disease or injury.

palpation (pal-**PAY**-shun) is an examination technique in which the examiner's hands are used to feel the texture, size, consistency, and location of certain body parts

palpitation (pal-pih-**TAY**-shun) is a pounding or racing of the heart.

prostate (**PROS**-tayt) refers to a male gland that lies under the urinary bladder and surrounds the urethra.

prostrate (**PROS**-trayt) means to collapse and be lying flat, facing downward, or to be overcome with exhaustion.

pyel/o, py/o, and pyr/o

pyel/o means renal pelvis (which is part of the kidney). **Pyelitis** (**pye**-eh-**LYE**-tis) is an inflammation of the renal pelvis (**pyel** means renal pelvis and **-itis** means inflammation).

py/o means pus. **Pyoderma** (**pye**-oh-**DER**-mah) is any acute, inflammatory, pus-forming bacterial skin infection such as impetigo (**py/o** means pus and **-derma** means skin).

pyr/o means fever or fire. **Pyrosis** (pye-**ROH**-sis), also known as **heartburn**, is discomfort due to the regurgitation of stomach acid upward into the esophagus (**pyr** means fever or fire and **-osis** means abnormal condition).

ABBREVIATIONS

Alzheimer's disease = AD

appendectomy or appendicitis = AP

barium enema, below elbow = BE

chronic fatigue syndrome = CFS

cyanosis = C

diagnosis = DG, Dg, Diag, diag, DX, Dx

different diagnosis = D/D, DD, DDx, diaf, diag

endoscopy = EN

gastroenteritis = GE

hemorrhage = HE

inflammation = Inflam, Inflamm

intramuscular = IM

pathology = PA, Pa, path

postnatal = PN

prognosis = prog, prong, Prx, Px

tonsillectomy = TE

venereal disease = VD

“When in doubt, write it out.”

It is important to learn abbreviations, it is most important to **communicate clearly and accurately**; so when in doubt, write it out!

Linking Word Sounds with Spelling

If you are unclear on the spelling of a term that you have heard and experience trouble looking up the term in the dictionary, consider the following guide:

If it sounds like	It may begin with	Example
F	F	flatus (FLAY-tus)
	PH	phlegm (FLEM)
J	G	gingivitis (jin-jih-VYE-tis)
	J	jaundice (JAWN-dis)
K	C	crepitus (KREP-ih-tus)
	CH	chole ra (KOL-er-ah)
	K	kyphosis (kye-FOH-sis)
	QU	quadriplegia (kwad-rih- PLEE-jee-ah)
S	C	cytology (sigh-TOL-oh- jee)
	PS	psychologist (sigh-KOL-oh-jist)
	S	serology (seh-ROL-oh- jee)
Z	X	xeroderma (zee-roh-DER- mah)
	Z	zygote (ZYE-goht)

HOMEWORK

Test your new skills in word parts of medical terminology!
Perform the following exercises the best you can without looking at the course material (preferred). If you need to refer to the course text—do so! If you need to consult your dictionary—do so! Note the terms or word parts you have trouble with to review later.
Good luck!

Matching Word Parts 1

Write the correct answer in the middle column.

	Definition	Correct Answer	Possible Answers
1.1	bad, difficult, painful	_____	-algia
1.2	excessive, increased	_____	dys-
1.3	liver	_____	-ectomy
1.4	painful, suffering	_____	hepat/o
1.5	surgical removal	_____	hyper-

Matching Word Parts 2

Write the correct answer in the middle column.

	Definition	Correct Answer	Possible Answers
1.6	abnormal condition	_____	hypo-
1.7	abnormal softening	_____	-itis
1.8	deficient, decreased	_____	-malacia
1.9	inflammation	_____	-necrosis
1.10	tissue death	_____	-osis

Matching Word Parts 3

Write the correct answer in the middle column.

Definition	Correct Answer	Possible Answers
1.11 bleeding, bursting forth	_____	-ostomy
1.12 surgical creation of an opening	_____	-otomy
1.13 surgical incision	_____	-plasty
1.14 surgical repair	_____	-rrhage
1.15 surgical suturing	_____	-rrhaphy

Matching Word Parts 4

Write the correct answer in the middle column.

Definition	Correct Answer	Possible Answers
1.16 visual examination	_____	-rrhea
1.17 rupture	_____	-rrhexis
1.18 abnormal narrowing	_____	-sclerosis
1.19 abnormal hardening	_____	-scopy
1.20 flow or discharge	_____	-stenosis

Matching Terms and Definitions

Write the correct answer in the middle column.

Definition	Correct Answer	Possible Answers
1.21 examination procedure	_____	laceration
1.22 male gland	_____	lesion
1.23 pathologic tissue change	_____	palpitation
1.24 pounding heart	_____	palpation
1.25 torn, ragged wound	_____	prostate

Matching Terms

Write the correct answer in the middle column.

	Definition	Correct Answer	Possible Answers
1.26	abnormal stomach condition	_____	cardiac
1.27	pertaining to the heart	_____	gastralgia
1.28	rupture of a muscle	_____	gastrosis
1.29	stomach pain	_____	myoplasty
1.30	surgical muscle repair	_____	myorrhexis

Word Building Exercise

These terms are not found in this module; however, they are made up of the following word parts. You may want to use your medical dictionary to check your answers.

neo- = new

arteri/o = artery

-algia = pain and suffering

arthr/o = joint

-itis = inflammation

cardi/o = heart

-ologist = specialist

nat/o = birth

-otomy = a surgical incision

neur/o = nerve

-rrhea = flow or discharge

rhin/o = nose

-scopy = visual examination

1.31 A medical specialist concerned with the diagnosis and treatment of heart disease is a/an _____.

1.32 The term meaning a runny nose is _____.

1.33 The term meaning the inflammation of a joint is _____.

1.34 A specialist in disorders of the newborn is called a/an _____.

1.35 The term meaning a surgical incision into a nerve is a/an _____.

1.36 The term meaning the visual examination of the internal structure of a joint is _____.

1.37 The term meaning an inflammation of an artery is _____.

1.38 The term meaning pain in a nerve or nerves is _____.

1.39 The term meaning a surgical incision into the heart is a/an _____.

1.40 The term meaning inflammation of the nose is _____.

Medical Terminology for Medical Assistants

Part II: The Human Body in Health and Disease

Objectives

At the end of this module, the learner will be able to:

- Define anatomy and physiology and use anatomic reference systems to identify the anatomic position, body planes, directions, and cavities.
- Recognize, define, spell and pronounce the terms related to the abdominal cavity and peritoneum.
- Recognize, define, spell and pronounce the terms related to the structure and function of the human body.
- Differentiate between genetic and congenital disorders and identify examples of each.
- Identify the body systems in terms of their major structures and functions.
- Recognize, define, spell, and pronounce the terms related to types of diseases and the modes of disease transmission.

Anatomic Reference Systems

Anatomic reference systems are used to describe the location and function of body parts, which include:

- Body planes
- Body directions
- Body cavities
- Structural units

Body parts can also be defined by their physiology, or function. Organs and tissues are grouped together into systems, such as the respiratory or circulatory system, because they work together to perform a single function.

- **Anatomy** (ah-NAT-oh-mee) is the study of the structures of the body.
- **Physiology** (fiz-ee-OL-oh-jee) is the study of the functions of these structures.

Body Directions

The relative location of sections of the body or of an organ can be described through the use of pairs of contrasting, or opposite, body direction terms.

Front & Back

Ventral (VEN-tral) refers to the front or belly side of the body or organ (ventr means belly side of the body and –al means pertaining to).

Dorsal (DOR-sal) refers to the back of the body or organ (dors means back of the body and –al means pertaining to).

Anterior (an-TEER-ee-or) means situated in the front. It also means on the forward part of an organ (anter means front or before and –ior means pertaining to).

Posterior (pos-TEER-ee-or) means situated in the back. It also means on the back part of an organ (poster means back or after and –ior means pertaining to).

For example, the stomach is located anterior to (in front of) the pancreas. Anterior is also used in reference to the ventral surface of the body.

For example, the pancreas is located posterior to (behind) the stomach. Posterior is also used in reference to the dorsal surface of the body.

Upper and Lower

Superior means uppermost, above, or toward the head.

Inferior means lowermost, below, or toward the feet.

For example, the lungs are located superior to (above) the diaphragm.

For example the stomach is located inferior to (below) the diaphragm.

Cephalic (seh-FAL-ick) means toward the head (cephal means head and –ic means pertaining to).

Caudal (KAW-dal) means toward the lower part of the body (caud means tail or lower part of the body and –al means pertaining to).

In The Middle

Proximal (PROCK-sih-mal) means situated nearest the midline or beginning of a body structure.

Distal (DIS-tal) means situated farthest from the midline or beginning of a body structure.

For example, the proximal end of the humerus (the bone of the upper arm) forms part of the shoulder.

For example, the distal end of the humerus forms part of the elbow.

Medial (ME-dee-yal) means the direction toward or nearer the midline.
For example, the medial ligament of the knee is near the inner surface of the leg.

Lateral (LA-te-ral) means the direction toward or nearer the side and away from the midline.

For example, the lateral ligament of the knee is near the side of the leg. **Bilateral** means relating to, or having, two sides.

Major Body Cavities

A **body cavity** is a space within the body that contains and protects the internal organs.

The Dorsal Cavity

The dorsal cavity, located in the skull and within the spinal column, is divided into two parts. *Dorsal* means pertaining to the back. They both protect the structures of the nervous system:

- The **cranial cavity**, which is located within the skull, protects the brain.
- The **spinal cavity**, which is located within the spinal column, protects the spinal cord.

The Ventral Cavity

The ventral cavity is located in the front of the body. It is divided into three parts and contains many of the body organs that maintain homeostasis. **Homeostasis** (**hoh-mee-oh-STAY-sis**) means maintaining a constant internal environment (**home/o** means constant and **-stasis** means control).

- The **thoracic cavity** (**thoh-RAS-ick**), also known as the **chest cavity** or **thorax**, protects the heart and the lungs. The **diaphragm** is a muscle that separates the thoracic and abdominal cavities.
- The **abdominal cavity** (**ab-DOM-ih-nal**), which contains primarily the major organs of digestion, is frequently referred to simply as the **abdomen** (**ab-DOH-men** or **AB-doh-men**). Note that abdomen is spelled *-en*, but the adjective abnormal is spelled *-inal*.
- The **pelvic cavity** (**PEL-vick**) is the space formed by the pelvic (hip) bones. It contains primarily the organs of the reproductive and excretory systems.
- There is no physical division between the abdominal and pelvic cavities. Together, they are referred to as the **abdominopelvic** (**ab-dom-ih-noh-PEL-vick**) **cavity** (**abdomin/o** means abdomen, **pelv**, means pelvis, and **-ic** means pertaining to).

Quadrants of the Abdomen

Describing where an abdominal organ or pain is located is made easier by dividing the abdomen into four imaginary quadrants. The term **quadrant** means divided into four.

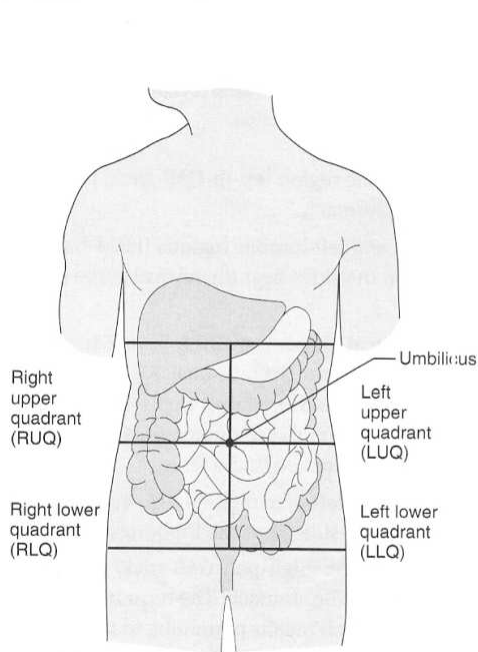


FIGURE 2.6 Division of the abdomen into quadrants.

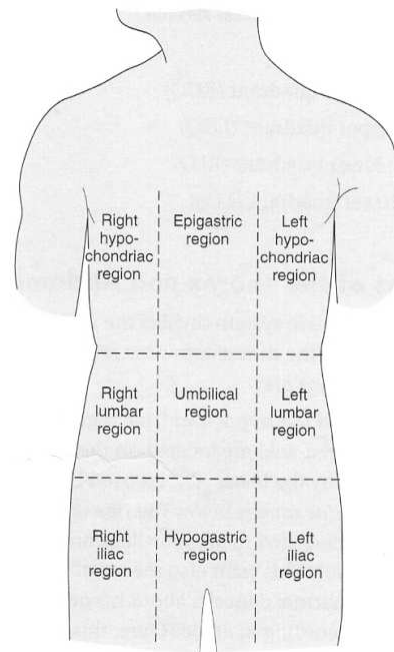


FIGURE 2.7 Regions of the thorax and abdomen.

Regions of the Thorax and Abdomen

Another descriptive system divides the abdomen and lower portions of the thorax into nine regions. These regions are:

- The **right and left hypochondriac regions** (**high-poh-KON-dree-ack**) are located on the sides and are covered by the lower ribs. As used here, *hypochondriac* means below the ribs (**hypo-** means below and **chondr/i-** means cartilage and **-ac** means pertaining to). This term also means an individual with an abnormal concern about his or her health because, according to ancient lore, this region below the ribs was the seat of hypochondria.
- The **epigastric region** (**ep-ih-GAS-trick**) is located above the stomach.
- The **right and left lumbar regions** (**LUM-bar**) are located on the sides near the inward curve of the spine.
- The **umbilical region** (**um-BILL-ih-kal**) surrounds the **umbilicus** (**um-BILL-ih-kus**). Also known as the **belly button** or **navel**, this pit in the center of the abdominal wall marks the point where the umbilical cord was attached to the fetus.
- The **right and left iliac regions** (**ILL-ee-ack**) are located on the sides over the hipbones.
- The **hypogastric** (**high-poh-GAS-trick**) **region** is located below the stomach. The term **inguinal** (**ING-gwih-nal**), which means pertaining to the **groin**, refers to the entire lower portion of the abdomen.

Peritoneum

The **peritoneum** (**pehr**-ih-toh-**NEE**-um) is a multilayered membrane that protects and holds the organs in place within the abdominal cavity. A *membrane* is a thin layer of tissue that covers a surface, lines a cavity, or divides a space or organ.

- The **parietal peritoneum** (**pah-RYE**-eh-tal **pehr**-ih-toh-**NEE**-um) is the outer layer of the peritoneum, and it lines the abdominal wall. Parietal means cavity wall.
- The **visceral peritoneum** (**VIS**-er-al **pehr**-ih-toh-**NEE**-um) is the inner layer of the peritoneum, and it surrounds the organs of the abdominal cavity. *Visceral* means relating to the internal organs.
- The **mesentery** (**MESS**-en-**terr**-ee) is a fused double layer of the parietal peritoneum that attaches parts of the intestine to the interior abdominal wall.
- The term **retroperitoneal** (**ret**-roh-**pehr**-ih-toh-**NEE**-al) means located behind the peritoneum, (**retro**- means behind, **periton** means peritoneum, and **-eal** means pertaining to).
- Peritonitis (**pehr**-ih-toh-**NIGH**-tis) is inflammation of the peritoneum (**periton** means peritoneum and **-itis** means inflammation).

Tissue: Cells Working Together

A tissue is a group or layer of similarly specialized cells that join together to perform certain specific functions.

- **Histology** (**hiss-TOL**-oh-jee) is the study of the structure, composition, and function of tissues (**hist** means tissue and **-ology** means a study of).
- A **histologist** (**hiss-TOL**-oh-jist) is a specialist in the study the organization of tissues at all levels (**hist** means tissue and **-ologist** means specialist).

Types of Tissue

The four main types of tissue are epithelial, connective, muscle, and nerve.

Epithelial Tissues

- **Epithelial tissues** (**ep**-ih-**THEE**-lee-al) form a protective covering for all of the internal and external surfaces of the body.
- **Epithelium** (**ep**-ih-**THEE**-lee-um) is the specialized epithelial tissue that forms the epidermis of the skin and the surface layer of mucous membranes.

HOMEWORK

Look up the following in your medical dictionary and complete the following definitions:

Pathology of Tissue Formation

Anaplasia (an-ah-PLAY-zee-ah)

Is a change in the structure of cells and in their orientation to each other. These abnormal cells are characteristic of malignancies, which are discussed further in the lymphatic and immune system module.

ana- means excessive

-plasia means formation

Aplasia (ah-PLAY-zee-ah)

a-

-plasia

Dysplasia (dis-PLAY-see-ah)

dys-

-plasia

Hypertroplasia (high-per-PLAY-zee-ah)

hyper-

-plasia

Hypertrophy (high-PER-troh-fee)

hyper-

-plasia

Hypoplasia (**high**-poh-**PLAY**-zee-ah)

hypo-

-plasia

Glands

A gland is a group of specialized epithelial cells that form secretions. A secretion is the substance produced by a gland. The two types of glands are exocrine and endocrine glands.

Exocrine glands (**ECK**-soh-krin)

such as sweat glands, secrete their chemical substances into ducts that lead either to other organs or out of the body.

exo- means out of

-crine means to secrete

Endocrine glands (**EN**-doh-krin)

endo-

-crine

Pathology and Procedures of the Glands

Adenectomy (ad-eh-**NECK**-toh-mee)

is the surgical removal of a gland

aden means gland

-ectomy means surgical removal

Adenitis (ad-eh-**NIGH**-tis)

aden

-itis

Adenoma (ad-eh-**NOH**-mah)

aden

-oma

Adenomalacia (ad-eh-noh-mah-**LAY**-shee-ah)

aden/o

-malacia

Adenosclerosis (ad-eh-noh-skleh-**ROH**-sis)

aden/o

-sclerosis

Adenosis (ad-eh-**NOH**-sis)

aden

-osis

Organs and Body Systems

An organ is a somewhat independent part of the body that performs a special function or functions. The tissues and organs of the body are organized into systems that perform specialized functions:

Body System	Major Structures	Major Functions
Skeletal System	bones joints cartilage ligaments	Supports and shapes the body. Protects the internal organs. Forms some blood cells and stores minerals.
Cardiovascular System	heart arteries veins blood	Blood circulates throughout the body to transport oxygen and nutrients to cells, and to carry waste products to the kidneys where the waste is removed by filtration.
Lymphatic and Immune Systems	lymph, lymph vessels and lymph nodes tonsils spleen thymus specialized blood cells	Protects the body from harmful substances. Brings oxygen and nutrients to cells. Removes waste from the cells.
Respiratory System	nose pharynx trachea larynx lungs	Brings oxygen into the body for transportation to the cells. Removes carbon dioxide and some water waste from the body.
Digestive System	mouth esophagus small intestines large intestines liver pancreas	Digests ingested food so it can be absorbed into the bloodstream. Eliminates solid wastes.
Urinary System	kidneys ureters urinary bladder urethra	Filters blood to remove waste. Maintains the electrolyte and fluid balance within the body.
Nervous System	nerves brain spinal cord	Coordinates the reception of stimuli. Transmits messages throughout the body.
Special Senses	eyes ears	Receive visual and auditory information and transmit it to the brain.
Integumentary System	skin sebaceous glands sweat glands	Protects the body against invasion by bacteria. Regulates the body temperature and water content.

Body System	Major Structures	Major Functions
Endocrine System	adrenals gonads pancreas parathyroids thymus pineal pituitary thyroid	Integrates all body functions.
Reproductive System	<p>Male: penis testicles</p> <p>Female: vagina ovaries uterus</p>	Produces new life.

Pathology

Pathology (pah-THOL-oh-jee) is the study of structural and functional changes caused by disease (**path/o** and **-pathy** mean disease; however, they also mean suffering, feeling and emotion). Pathology also means a condition caused by disease.

- A **pathologist** (pah-THOL-oh-jist) specializes in the laboratory analysis of tissue samples to confirm or establish a diagnosis (**path** means disease and **-ologist** means specialist). These tissue specimens may be removed as biopsies, during operations, or postmortem examinations. *Postmortem* means after death and a postmortem examination is also known as an autopsy (AW-top-see).
- **Etiology** (ee-tee-OL-oh-jee) is the study of the causes of diseases (**eti-** means cause and **-ology** means study of).

Disease Transmission

- A **communicable disease** (kuh-MEW-nih-kuh-bul), also known as a **contagious disease**, is any disease transmitted from one person to another either by direct contact or indirectly by contact with contaminated objects. *Contaminated* means a pathogen is possibly present. Contamination may occur through a lack of proper hygiene standards, such as hand washing, or by failure to take appropriate precautions.
- **Bloodborne transmission** is through contact with blood or body fluids that are contaminated with blood. Examples of bloodborne transmission are human immunodeficiency virus (HIV), hepatitis B, and most sexually transmitted diseases (STDs).

HOMEWORK

Look up the following in your medical dictionary and complete the following definitions:

Outbreaks of Diseases

Epidemiologist (ep-ih-dee-mee-OL-oh-jist)

Endemic (en-DEM-ick)

Epidemic (ep-ih-DEM-ick)

Pandemic (pan-DEM-ick)

Abbreviations Related to the Human Body in Health and Disease

anterior =	A
abdomen =	Abd, Abdo
anatomy =	anat
cephalic =	CEPH
communicable disease =	CD
chromosome =	CH, chr
cystic fibrosis =	CF
cytology, cytoplasm =	cyt
deoxyribonucleic acid =	DNA
dorsal =	D
Down syndrome =	DS
epidemic =	epid
etiology =	E
fetal alcohol syndrome =	FAS
hemophilia =	HEM, hemo
histology =	HIS, Histo, histol
Huntington's disease =	HD
muscular dystrophy =	MD
phenylketonuria =	PKU
physiology, posterior =	P
sickle cell anemia =	SCA
Tay-Sachs disease =	TSD
umbilical =	umb
ventral =	V, vent, ventr

HOMEWORK

Matching Word Parts 1

Write the correct answer in the middle column.

Definition	Correct Answer	Possible Answers
2.1. crown, coronary	_____	adip/o
2.2. fat	_____	aden/o
2.3. gland	_____	home/o
2.4. constant	_____	cephal/o
2.5. relating to the head	_____	coron/o

Matching Word Parts 2

Write the correct answer in the middle column.

Definition	Correct Answer	Possible Answers
2.6. within	_____	cyt/o
2.7. above	_____	epi-
2.8. cell	_____	hist/o
2.9. out of	_____	exo-
2.10. tissue	_____	endo-

Matching Word Parts 3

Write the correct answer in the middle column.

Definition	Correct Answer	Possible Answers
2.11 pertaining to	_____	path/o
2.12. control	_____	retro-
2.13. disease, suffering, and emotion	_____	-plasm

- 2.14. formative material of _____ -ac
 cells
- 2.15. behind _____ -stasis

Matching Regions of the Thorax and Abdomen

Write the correct answer in the middle column.

Definition	Correct Answer	Possible Answers
2.16. above the stomach	_____	epigastric
2.17. belly button	_____	hypochondriac
2.18. below the ribs	_____	hypogastric
2.19. below the stomach	_____	iliac
2.20. hipbone	_____	umbilicus

Term Selection

Select the correct answer and write it on the line provided.

2.21. The term meaning situated nearest the midline or beginning of a body structure is _____.

- distal lateral medial proximal

2.22. The term meaning situated in the back is _____.

- anterior posterior superior ventral

2.23. The body is divided into front and back portions by the _____ plane.

- coronal horizontal sagittal transverse

2.24. The body is divided vertically into equal left and right halves by the _____ plane.

- frontal midsagittal sagittal transverse

2.25. Part of the elbow is formed by the _____ end of the humerus.

- distal lateral medial proximal

Challenge Word Building

This group of exercises provides an opportunity to work with the word parts you have learned thus far. To answer the question, combine the appropriate parts. While doing this, pay attention to the combining vowels! You may want to look in the textbook glossary or use a medical dictionary to check your answers.

gastr/o = stomach

-algia = pain

laryng/o = larynx

-ectomy = surgical removal

my/o = muscle

-itis = inflammation

nephro/o = kidney

-osis = abnormal condition

neur/o = nerve

-plasty = surgical repair

2.26. The term meaning the surgical repair of a muscle is _____.

2.27. The term meaning pain in a nerve is _____.

2.28. The term meaning an abnormal condition of the stomach is _____.

2.29. The term meaning inflammation of the larynx is _____.

2.30. The term meaning the surgical removal of part of a muscle is a/an _____.

2.31. The term meaning pain in the stomach is _____.

2.32. The term meaning surgical removal of the larynx is _____.

2.33. The term meaning an abnormal condition of the kidney is _____.

2.34. The medical term meaning surgical repair of a nerve is _____.

2.35. The term meaning inflammation of the kidney is _____.

Medical Terminology for Medical Assistants
Part II A: Word Part Review

In the first two parts of this self-study medical terminology course, you were introduced to many word parts. As you study the body system chapters, you will learn even more word parts as they relate to each system. Your study of the body systems will be much easier if you have mastered at least the word parts in section.

The 50 question Word Part Practice Session gives you additional word part practice, as well as opportunities to use combining vowels correctly and build unfamiliar terms based on familiar word parts.

WORD PART PRACTICE SESSION

Matching Word Parts 1

Write the correct answer in the middle column.

Definition	Correct Answer	Possible Answers
WP.1. bad, difficult, painful	_____	intra-
WP.2. between, among	_____	hyper-
WP.3. deficient, decreased	_____	inter-
WP.4. excessive, increased	_____	hypo-
WP.5. within, inside	_____	dys-

Matching Word Parts 2

Write the correct answer in the middle column.

Definition	Correct Answer	Possible Answers
WP.6. above, excessive	_____	pre-
WP.7. before	_____	peri-
WP.8. many	_____	poly-
WP.9. surrounding	_____	sub-
WP.10. under, less, below	_____	supra-

Matching Word Parts 3

Write the correct answer in the middle column.

Definition	Correct Answer	Possible Answers
WP.11. inflammation	_____	-algia
WP.12. pain, suffering	_____	-centesis
WP.13. the process of producing a picture or record	_____	-ectomy
WP.14. surgical puncture to remove fluid	_____	-itis
WP.15. surgical removal	_____	-graphy

Matching Word Parts 4

Write the correct answer in the middle column.

Definition	Correct Answer	Possible Answers
WP.16. surgical repair	_____	-dynia
WP.17. abnormal softening	_____	-malacia
WP.18. pain	_____	-necrosis
WP.19. tissue death	_____	-oma
WP.20. tumor or neoplasm	_____	-plasty

Matching Word Parts 5

Write the correct answer in the middle column.

Definition	Correct Answer	Possible Answers
WP.21. abnormal condition disease	_____	-ac
WP.22. abnormal hardening	_____	-ostomy
WP.23. cutting, surgical incision	_____	-osis

- WP.24. pertaining to _____ -otomy
- WP.25. surgical creation _____ -sclerosis
of an opening

Matching Word Parts 6

Write the correct answer in the middle column.

Definition	Correct Answer	Possible Answers
WP.26. abnormal flow, discharge	_____	-rrhagia
WP.27. abnormal tightening or narrowing	_____	-rrhaphy
WP.28. bleeding	_____	-rrhea
WP.29. rupture	_____	-rrhexis
WP.30. to suture	_____	-stenosis

True/ False

If the statement is true, write T on the line. If the statement is false, write F on the line.

- WP.31. _____ **myc/o** means mucous.
- WP.32. _____ **peri-** means surrounding.
- WP.33. _____ **hyper-** means below, under, decreased.
- WP.34. _____ **ather/o** means plaque or fatty substance.
- WP.35. _____ **-gram** means an instrument for recording.
- WP.36. _____ **arthr/o** means joint.
- WP.37. _____ **-ologist** means study of.
- WP.38. _____ **-megaly** means enlargement.
- WP.39. _____ **-centesis** means to see or a visual examination.

Word Building

Write the word you created on the line provided.

- WP.40. The medical term meaning an abnormal flow commonly known as a runny nose is _____. (**rhin/o** means nose.)
- WP.41. The term meaning the surgical removal of a kidney is a/an _____. (**nephr/o** means kidney.)
- WP.42. The term meaning inflammation of the ear is _____. (**ot/o** means ear.)
- WP.43. The term meaning an enlarged heart is _____. (**cardi/o** means heart.)
- WP.44. The term meaning inflammation of the liver is _____. (**hepat/o** means liver.)
- WP.45. The term meaning the visual examination of the interior of a joint is _____. (**arthr/o** means joint.)
- WP.46. A specialist in disorders of the urinary system is known as a/an _____. (**ur/o** means urine.)
- WP.47. The study of disorders of the blood is known as _____. (**hemat/o** means blood.)
- WP.48. The medical term meaning a surgical incision into the colon is a/an _____. (**col/o** means colon.)
- WP.49. The medical term meaning inflammation of a vein is _____. (**phleb/o** means vein.)
- WP.50. The term meaning a record of the electrical activity of the heart is an ECG or a/an _____. (**electr/o** means electric and **cardi/o** means heart.)