

BOSTON REED  
PHLEBOTOMY TECHNICIAN TRAINING PROGRAM

Medical Terminology

Medical terminology is based on an understanding of a few basic elements primarily derived from Greek and Latin words that form the foundation of nearly all medical terms. These elements are word roots, prefixes, suffixes, combining vowels, and combining forms.

**WORD ROOTS**

The foundation of all medical terms is a **word root**. A word root establishes the basic meaning of the term and usually signifies a tissue, organ, or body system involved. An example is the Greek root *nephr*, meaning “kidney.” Sometimes there is both a Greek and Latin root with the same meaning. For example the Latin root *ren* means “kidney.” In a few cases, the same root will have very different meanings, such as the root *ped* which means both “foot” and “child.” In these cases, it is necessary to consider the context in which the word is used. Some medical terms have more than one word root. An example is the word *cardiopulmonary*, which is made up of two word roots: *cardi*, meaning “heart”, and *pulmo*, meaning “lung.”

***COMMON MEDICAL WORD ROOTS***

<i>Root</i>	<i>Meaning</i>	<i>Example</i>
aer	air	aerobic
angi	vessel	angiogram
arteri	artery	arteriosclerosis
arthr	joint	arthritis
bili	bile	bilirubin
bronch	bronchus	bronchitis
cardi	heart	electrocardiogram
cephal	head	cephalic
chondr	cartilage	osteochondritis
cry	cold	cryoglobulin
cyst	bladder	cystitis
cyt, cyte	cell	cytology
derm	skin	dermabrasion
encephal	brain	encephalitis
esophag	esophagus	esophagitis
gastr	stomach	gastrectomy
glyc	sugar	glycolysis
hem	blood	hematology
hepat	liver	hepatitis
lip	fat	liposuction
my	muscle	myalgia
nephr	kidney	nephritis

## ***COMMON MEDICAL WORD ROOTS (cont.)***

<i>Root</i>	<i>Meaning</i>	<i>Example</i>
onc	tumor	oncologist
oste	bone	osteochondritis
path	disease	pathogen
phleb	vein	phlebotomy
pulmon	lung	pulmonary
ren	kidney	renal
scler	hard	sclerotic
thromb	clot	thrombosis
thorac	chest	thoracic
tox	poison	toxicology
vas	vessel	vasectomy
ven	vein	venipuncture

## **PREFIXES**

A **prefix** precedes a word root and modifies its meaning. A term is never made up of a prefix alone.

<i>Example:</i>	A /	NUCLEAR
	prefix	root
	(without)	(nucleus)

The prefix “a” means “without.” The word root “nuclear” means nucleus. The word “anuclear” means “without a nucleus.”

## ***COMMON MEDICAL PREFIXES***

<i>Prefix</i>	<i>Meaning</i>	<i>Example</i>
a-, an-, ar-	without	arrhythmia
aniso-	unequal	anisocytosis
anti-	against	antiseptic
bi-	two	bicuspid
brady-	slow	bradycardia
cyan-	blue	cyanotic
dys-	difficult	dyspnea
endo-	in, within	endothelium
epi-	on, over	epidermis
erythr-	red	erythrocyte
extra-	outside	extravascular
hetero-	different	heterosexual
homo-	same	homogeneous
hyper-	too much, high	hypertension
hypo-	low, under	hypoactive
intra-	within	intramuscular
inter-	between	intercellular

## ***COMMON MEDICAL PREFIXES (cont.)***

<i>Prefix</i>	<i>Meaning</i>	<i>Example</i>
iso-	equal, same	isothermal
macro-	large, long	macrocyte
mal-	poor	malnutrition
micro-	small	microcyte
mono-	one	mononuclear
neo-	new	neonatal
poly-	many, much	polyuria
post-	after	postprandial
pre-	before	prenatal
per-	through	percutaneous
semi-	half	semilunar
tachy-	rapid	tachycardia
tri-	three	tricuspid

## **SUFFIXES**

A **suffix**, often referred to as a word ending, follows a word root and either changes or adds to the meaning of the word root. A word meaning is best determined by starting with the suffix. As with the prefix, a suffix never stands alone.

*Example:*

GASTR /	IC
root	suffix
(stomach)	(pertaining to)

The word root “gastr” means “stomach”. The suffix “ic” means “pertaining to”. The word gastric means “pertaining to the stomach.”

## ***COMMON MEDICAL SUFFIXES***

<i>Suffix</i>	<i>Meaning</i>	<i>Example</i>
ac, -al	pertaining to	cardiac, neural
-algia	pain	neuralgia
-ar, -ary	pertaining to	muscular, urinary
-centesis	surgical puncture to remove a fluid	thoracentesis
-emia	blood condition	anemia
-gram	recording, writing	electrocardiogram
-ic	pertaining to	thoracic
-ism	condition	hypothyroidism
-itis	inflammation	tonsillitis
-logist	specialist in the study of	cardiologist
-lysis	breakdown, separation	hemolysis
-megaly	enlargement	acromegaly
-meter	instrument that measures or counts	thermometer
-oma	tumor	hepatoma
-osis	condition	necrosis
-oxia	oxygen level	hypoxia

**COMMON MEDICAL SUFFIXES (cont.)**

<i>Suffix</i>	<i>Meaning</i>	<i>Example</i>
-pathy	disease	cardiomyopathy
-penia	deficiency	leucopenia
-pnea	breathing	dyspnea
-stasis	stopping, controlling	hemostasis
-tomy	cutting, incision	phlebotomy

**COMBINING VOWELS**

A **combining vowel** (usually an “o”) joins the word root to a suffix or another word root

A combining vowel eases pronunciation.

<i>Example:</i>	HEMAT	/ O /	LOGY
	root	combining vowel	suffix
	(blood)		(study of)

The word root “hemat,” meaning “blood,” is joined by the combining vowel “o” to “logy,” meaning “the study of.” Hematology thus means “the study of blood.”

The combining vowel is usually dropped when the suffix begins with a vowel.

<i>Example:</i>	PHLEBO /	ITIS
	root	suffix
	(vein)	(inflammation)

Because the suffix “itis” begins with a vowel, a combining vowel is not used after the word root “phleb.” Phlebitis means “inflammation of a vein.”

In terms made up of two word roots, the combining vowel is kept between the word roots, even if the second root begins with a vowel.

<i>Example:</i>	GASTR / O /	ENTER / O /	LOGY
	root	root	suffix
	(stomach)	(intestines)	(study of)

The combining vowel after “gastr” remains, even though the second root “enter” begins with a vowel. Gastroenterology means “study of the stomach and intestines.”

**COMBINING FORMS**

A word root along with a combining vowel is called a **combining form**. A combining form can be attached to a suffix or another word root.

<i>Example:</i>	LEUK	/ O /	CYTE
	root	combining form	root
	(white)	+ combining vowel	+ root (cell)

The word “leuk,” meaning “white,” combined with the word “cyte,” meaning “cell,” combines to form leukocyte, meaning “white cell,” or more commonly, “white blood cell.”

## **PLURAL ENDINGS**

Some medical terms have unique plural forms based on the ending of the word.

### ***UNIQUE PLURAL ENDINGS***

<i>Word Ending</i>	<i>Plural Ending</i>	<i>Singular Example</i>	<i>Plural Example</i>
-a	-ae	vena cave	vena cavae (ka've)
-en	-ina	lumen	lumina (lu'min-a)
-ex, -ix	-ices	appendix	appendices (a-pen'di-sez)
-is	-es	crisis	crises (kri'sez)
-nx	-nges	phalanx	phalanges (fa-lan'-jez)
-on	-a	protozoon	protozoa (pro''to-zo'a)
-um	-a	ovum	ova (o'va)
-us	-I	nucleus	nuclei (nu'kle-i)

### **MEDICAL TERMINOLOGY REMINDERS**

1. When defining a medical term, begin at the suffix and read back through the word to the beginning.
2. When a suffix starts with a vowel, drop the combining vowel before the suffix.
3. A combining vowel remains between word roots, even when the root begins with a vowel.

### **COMMON MEDICAL ABBREVIATIONS AND SYMBOLS**

ABGs	arterial blood gases
ABO	blood group system
a.c.	before meals
ACTH	adrenocorticotrophic hormone
ADH	antidiuretic hormone
ad lib	as desired
AIDS	acquired immunodeficiency syndrome
ALL	acute lymphocytic leukemia
ALT	alanine transaminase (see SGPT)
AML	acute myelocytic leukemia
aq	water (aqua)
AST	aspartate aminotransferase (see SGPT)
ASO	antistreptolysin O
b.i.d.	twice a day ( bis in die)
bili	bilirubin
BP	blood pressure
BUN	blood urea nitrogen
Bx	biopsy
̄	with (cum)
Ca	calcium
CAD	coronary artery disease

**COMMON MEDICAL ABBREVIATIONS AND SYMBOLS (cont.)**

CBC	complete blood count
cc	cubic centimeter
CCU	coronary care unit
Chemo	chemotherapy
CK	creatin kinase
cm	centimeter
CML	chronic myelogenous leukemia
CNS	central nervous system
CO <sub>2</sub>	carbon dioxide
COPD	chronic obstructive pulmonary disease
CPR	cardiopulmonary resuscitation
crit	hematocrit (see HCT)
C-section	cesarean section
CSF	cerebrospinal fluid
CT scan	computed tomography scan
CVA	cerebrovascular accident (stroke)
CXR	chest x-ray
DIC	disseminated intravascular coagulation
diff	differential count of white blood cells
dil	dilute
DNA	deoxyribonucleic acid
DOB	date of birth
Dx	diagnosis
EBV	Epstein-Barr virus
ECG	electrocardiogram
EEG	electroencephalogram
EKG	electrocardiogram
ENT	ear, nose, and throat
Eos	eosinophils
ER	emergency room
ESR	erythrocyte sedimentation rate (sed rate)
exc	excision
FBS	fasting blood sugar
Fe	iron
FSH	follicle stimulation hormone
FUO	fever of unknown origin
GI	gastrointestinal
Gm, gm, g	gram
GTT	glucose tolerance test
GYN	gynecology
h	hour
Hb, Hgb	hemoglobin
HbsAg	hepatitis B surface antigen
HCG	human chorionic gonadotropin
HCL	hydrochloric acid
Hct	hematocrit (see crit)
HDL	high density lipoprotein

**COMMON MEDICAL ABBREVIATIONS AND SYMBOLS (cont.)**

Hg	mercury
HIV	human immunodeficiency virus
h / o	history of
H <sub>2</sub> O	water
h.s.	at bedtime (hora somni)
hx	history
ICU	intensive care unit
IM	intramuscular
IV	intravenous
IVP	intravenous pyelogram
K <sup>+</sup>	potassium
Kg	kilogram
L	liter
L	left
Lat	lateral
LD / LDH	lactic dehydrogenase
LDL	low density lipoprotein
LE	lupus erythematosus (lupus)
lymphs	lymphocytes
lytes	electrolytes
m	meter
MCH	mean corpuscular hemoglobin
MCHC	mean corpuscular hemoglobin concentration
MCV	mean corpuscular volume
mets	metastases
mg	milligram
MG <sup>++</sup>	magnesium
MI	myocardial infarction
mL	milliliter
mm	millimeter
mono	monocyte
MRI	magnetic resonance imaging
MS	multiple sclerosis
Na <sup>+</sup>	sodium
neg	negative
NG	nasogastric
NPO	nothing by mouth (nulla per os)
O <sub>2</sub>	oxygen
OB	obstetrics
O&P	ova and parasite
OR	operating room
P	pulse;phosphorus
Path	pathology
p.c.	after meals
PCO <sub>2</sub>	pressure of carbon dioxide in the blood
Peds	pediatrics
pH	hydrogen ion concentration(measure of acidity or alkalinity)

**COMMON MEDICAL ABBREVIATIONS AND SYMBOLS (cont.)**

PKU	phenylketonuria
PMNs	polymorphonuclear leukocytes
PO <sub>2</sub>	pressure of oxygen in the blood
p / o	postoperative
p.o.	orally (per os)
polys	polymorphonuclear leukocytes
pos	positive
post-op	after operation
PP	after meals (postprandial)
pre-op	before operation
prep	prepare for
PRN, prn	as necessary (pro re nata)
PT	prothrombin time / protime
PTT	partial thromboplastin time
pt	patient
PVC	premature ventricular concentration
q.n.s.	quantity not sufficient
R	right
RA	rheumatoid arthritis
RBC	red blood cell (also rbc)
req	requisition
RIA	radioimmunoassay
R / O	rule out
RPR	rapid plasma regain
RT	respiratory therapy
RR	recovery room
Rx	treatment
̄	without
Sed rate	erythrocyte sedimentation rate (ESR)
segs	segmented white blood cells
SGOT	serum glutamic-oxaloacetic transaminase (see AST)
SGPT	serum glutamic-pyruvic transaminase (see ALT)
SLE	systemic lupus erythematosus
SMAC	sequential multiple analyzer computerized
sol	solution
Staph	staphylococcus
STAT, stat	immediately
Strep	streptococcus
Sx	symptoms
T	temperature
T <sub>3</sub>	triiodothyronine (a thyroid hormone)
T <sub>4</sub>	thyroxine (a thyroid hormone)
TB	tuberculosis
T cells	lymphocytes from the thymus
T & C	type and crossmatch (type & x)
TIBC	total iron binding capacity
TPN	total parenteral nutrition (intravenous feeding)

**COMMON MEDICAL ABBREVIATIONS AND SYMBOLS (cont.)**

TPR	temperature, pulse, and respiration
Trig	triglycerides
TSH	thyroid stimulating hormone
Tx	treatment
U	unit
UA, ua	urinalysis
URI	upper respiratory infection
UTI	urinary tract infection
UV	ultraviolet
VCU	voiding cystourethrogram
VD	venereal disease
VDRL	venereal disease research laboratory
W	water reactive
WBC, wbc	white blood cell
wd	wound
WT, wt	weight
y / o	years old