



## Building a Medical Vocabulary: A Guide for Medical Students

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# Building a Medical Vocabulary: A Guide for Medical Students

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**Abstract:** Medical terminology consists of so many new words and terms that medical students often have a difficult time learning and understanding them. This paper outlines how medical words are constructed and offers a few simple rules for students to follow to enable them to acquire, understand and develop a high degree of proficiency in medical terminology.

**Key words:** medical terms, vocabulary building, medical language

## 1. Introduction

Medical language is a special language. It is made up of a vast pool of words and terms, labeled “medical terminology”, that have been made specifically for doctors to use in their work and especially for doctor-to-doctor communication. Medical students in particular are required to spend many years studying and remembering medical terminology and medical language as they progress through to graduation as doctors. Indeed, it has been estimated that students need to learn approximately 13,000 new words in their first year of medical study<sup>1</sup>. This is not an easy task, with an ever-expanding number of medical names and terms used to describe the human body and its various parts, symptoms, diseases, health problems, procedures, research and the development of new medical terms.

Many medical terms (e.g. hypotension, angiograph, myocardial infarction) are incomprehensible or barely so for many laypeople as these terms are outside their regular daily vocabulary, depending on their socio-economic background and life experience. Some medical vocabulary is used specifically to describe medical purposes and practices, and some add precision or solemnity to descriptions of a patient's condition. And although these terms are often beyond the comprehension of everyday people about whom these terms are used, medical terminology is indispensable to the study of medicine and so should be undertaken with both seriousness and due diligence.

This paper outlines how medical words are constructed and offers a few simple rules for students to follow to enable them to acquire, understand and develop a high degree of proficiency in medical terminology.

## **2. The roots of medical terminology**

Medical terminology is the special vocabulary developed over time for use by physicians to “accurately describe the human body and associated components, conditions, processes and procedures in a science-based manner.”<sup>2</sup> Medical terminology has also been defined as “the science which deals with the investigation, arrangement and construction of medical terms.”<sup>3</sup> It is this second definition that has developed the corpus described in the first definition, the roots of which can be found in the historical records of medical history. Although the history of medicine is quite long, virtually as long as human history itself, modern medical terminology rests primarily upon a Greek and Roman foundation. Indeed, early Greek physicians certainly learned and accumulated a great deal of medical knowledge from other civilizations, especially from ancient Egypt and India, but it was the Greeks who assimilated this knowledge and gave it names that spread to other lands, e.g. throughout the Roman Empire, that gave its use force and weight. This subsequent mixture of Greek and Latin medical terms and word formation is the basis for many of the currently used medical terms used today by medical professionals. For example, the word “diabetes” was derived from the Greek word meaning “a siphon.”; the 2nd-century A.D. Greek physician, Aretus the Cappadocian, named this condition “diabetes” after he observed that patients with this problem “passed water like a siphon.”<sup>4</sup> However, many more medical words are often cobbled together from two or more building blocks, also derived mainly from Greek or Latin origins, along with many prefixes and suffixes that form the components of many polysyllabic medical terms.

Fortunately, there are far fewer components (prefixes, roots, and suffixes) than there are words that combine these components, so memorizing the meaning of the components can reduce how much needs to be memorized, and can help in understanding words that are unfamiliar but are based on these components. Thus, if medical students can acquire some understanding of the linguistic structure and components that form the basis of common medical terms, they will find the task of acquiring them much easier. It should also be noted that numerous other languages have also contributed to the vast pool of medical terms now in common use, as well as new terms derived from eponyms (named after those who make discoveries, e.g. Alzheimer’s disease); nevertheless, the foundations of most basic terms are Greek and Latin. This paper will now look at how some of the most commonly used terms are constructed and how this may facilitate the building of a wider medical vocabulary for medical students.

## **3. A systematic approach**

Medical students need to take a systematic approach to medical word building and term comprehension. In order to facilitate the building of this knowledge, students will first need to become familiar with the most common word roots, prefixes, and suffixes. In brief, a word root is a component derived from a source language such as Greek or Latin, and usually describes a body part. A prefix is a segment that can

be added to the front of a term to modify a word root by giving additional information about the location of an organ, the number of parts, or time involved. Suffixes are segments attached to the end of a word root to add meaning such as condition, disease process, or procedure. If students can learn and understand the origins of medical terms and realize that complex words are just an assembly of smaller components, then building a medical vocabulary becomes much easier.

In the tables below, I have arranged information into a simple format (segment, root, example) and in small-sized chunks for easier acquisition. I suggest medical students study each table in turn, employing whatever learning strategies work best for them, and endeavor to make more word associations with each primary root, prefix or suffix to anchor these most common segments in their memories. Later, when coming across new medical terms, students should first de-construct the term and examine it's various parts for the segments they are familiar with and attempt to formulate a meaning; of course, when time permits, they should also check an appropriate medical dictionary for accuracy.

#### 4. Word roots

A good place to start is with root words for major parts of the human body and for descriptors. The following tables contain sets of common terms<sup>5</sup> for body parts and color. It is important that students pay particular attention to how the Greek or Latin root is used in the formation of the example medical term shown at the end of each row; in these examples, the root word is used as the head of the medical term with a suffix added to indicate a particular function, event or disease.

##### 4.1 Root words for body parts #1

Body element	Greek root	Latin root	Examples
abdomen	lapar(o)-	abodomin-	Laparoscopy
artery	arteri(o)-	—	Arteriosclerosis
blood	hemat-, haemat- (haem-, hem-)	sangui-, sanguine-	Hemorrhage
blood clot	thromb(o)-	—	Thromboembolism
bone	osteo-	—	Osteoarthritis
brain	encephal(o)-	cerebr(o)-	Encephalitis
breast	mast(o)-	mamm(o)-	Mastectomy
chest	steth(o)-	thorac(i)-, thorac(o)-	Thoracotomy
ear	ot(o)-	aur-	Otitis
eye	ophthalm(o)-	ocul(o)-	Ophthalmoscopy
heart	cardi(o)-	cordi-	Cardiograph
intestine	enter(o)-	—	Enterotoxins

**4.2 Root words for body parts #2**

Body element	Greek root	Latin root	Examples
kidney	nephr(o)-	ren-	Nephrology, renal
liver	hepat- (hepatic-)	—	Hepatitis
lungs	pneumon-	pulmon(i)- (pulmo-)	Pneumonia
mind	psych-	—	Psychology
neck	trachel(o)-	cervic-	Tracheotomy,
nerve; the nervous system	neur(o)-	nerv-	Neurology
nose	rhin(o)-	nas-	Rhinitis, nasal
skin	dermat- (derm-)	cut-, cuticul-	Dermatitis
skull	crani(o)-	—	Cranium
stomach	gastr(o)-	ventr(o)-	Gastritis

**4.3 Root words for body parts #3**

Body element	Greek root	Latin root	Examples
throat (upper throat cavity)	pharyng(o)-	—	Pharyngitis
throat (lower throat cavity/voice box)]	laryng(o)-	—	Laryngitis
tooth	odont(o)-	dent-	Dentist
tongue	gloss-, glott-	lingu(a)-	Glossitis
tumor	cel-	—	Celotomy
urine, urinary System	ur(o)-	urin(o)-	Urologist, urinalysis
vein, the veins	phleb(o)-	ven-	Phlebitis, venous

**4.4 Colors**

Body element	Greek root	Latin root	Examples
black	melano-	—	Melanoma
blue	cyano-	—	Cyanosis
gray, grey	polio-	—	Poliomyelitis
green	chlor-	—	Chlorine
red	erythr(o)-, rhod(o)-	rub-, rubr-	Erythrocyte, ruby
red-yellow	cirr(h)o-	—	Cirrhosis
white	leuc-, leuk-	alb-	Leukemia, albino
yellow	xanth(o)-	—	Xanthoma

## 5. Medical prefixes

A large number of medical terms have been constructed by adding a prefix to the front of another medical word to modify the root word to give it additional information about the location of an organ, the number of parts, or time involved. Examples<sup>6</sup> of prefixes used in medicine are shown in the following tables.

### 5.1 Directional prefixes

Prefix	Meaning	Examples
Circum-	around	Circumcise (cut around)
Peri-	around	Perianal (around the anus)
Retro-	behind (behind the breastbone)	Retrosternal
Sub-	below	Subclavian (below collar bone)
Trans-	through	Transfusion, transplant
Epi-	upon, on top	Epidermis
Endo-	within, inside of	Endoscopy (to inspect an internal organ or body cavity )
Intra-	within	Intravenous (inside the veins, e.g. IV fluids)
Inter-	in between	Intercostal muscles (between the ribs)

### 5.2 General prefixes

Prefix	Meaning	Examples
A- (an-)	Not, without, -less	Anemia (less blood)
Ab-	Away, from	Abnormal (away from normal)
Ad-	To, towards	Adrenal (toward the kidney)
Ante-	Before	Ante-position
Anti-	Against, opposed to	Antibody, antibiotic
Contra-	Against, opposed	Contraceptive
Dia-	Through, throughout, completely	Diagnosis, dialysis
Dys-	Bad, not, ill, abnormal	Dysfunction, dysentery
Extra-	Outside of, beyond, in addition	Extraordinary
Homeo-	Similar, same	Homeostasis
Hyper	Over, above, excessive	Hypercalcemia
Hypo-	Lack, deficiency	Hyposensitivity
Macro-	Large, long	Macrocyte (large cell)
Mega-	Great	Megacardia (too large heart)
Micro-	Small	Microscope

Prefix	Meaning	Examples
Neo-	New	Neonatal, neoplasm
Patho-	Suffering, disease	Pathogen, pathology
Photo-	Light	Photonic
Post-	After, behind	Post-natal
Pro-	Forward,	Prothrombin
Re-	Back, again	Relapse
Tox- , toxi-	Poison	Toxic

### 5.3 Numbering prefixes

Prefix	Meaning	Examples
Bi- , bis-	Two, twice	Bilateral
Demi-, semi-	Half	Semicoma
Di-	Two, double	Diplegia
Hemi-	One-half	Hemisphere
Pan-	Total	Pancytopenia
Poly-	Many	Polycystic
Uni-	One	Union

## 6. Suffixes

Suffixes, segments attached to the end of a word root to add meaning, used in medical terminology can be divided into three basic groups:

1. suffixes used for diagnostic terms,
2. suffixes used for operative terms, and
3. suffixes used for symptomatology.

Again, with regard to the linguistic origins of the word blocks, the convention is that Greek suffixes are used with Greek terms and Latin suffixes are used with Latin terms. And as a general rule of thumb, diagnostic and surgical terms usually have a Greek origin, and terms for anatomy usually have Latin origins. The following tables list common medical suffixes, along with their meaning, word origin and root, and English examples.

### 6.1 Suffixes used for diagnostic terms

Suffix	Suffix Meaning	Origin; Etymology	Examples
-cyte	A hollow, a cell	Greek; hollow	Leukocyte
-emia	Blood condition	Greek; blood illness	Leukemia
-ia	Diseased condition	Greek; sickness	Insomnia
-osis	State or condition of	Greek; condition	Prognosis
-itis	Inflammation	Greek; flaring	Bronchitis
-oma	Indicating a morbid condition, often a tumor	Latin (crab); cancer	Carcinoma
-pathy	Denotes a disease or disorder (with a negative sense)	Greek; disease	Sociopathy, neuropathy
-trophy	Relating to nourishment	Greek; nourish	Dystrophy

### 6.2 Suffixes used for operative terms

Suffix	Suffix Meaning	Origin; Etymology	Examples
-ectomy	A surgical operation or removal of a body part	Greek; excision	Mastectomy
-plasty	Denotes surgical repair	Greek; repair	Rhinoplasty
-tomy	Denotes a surgical operation or removal of a body part; incision, cutting	Greek; remove	Appendectomy
-lysis	Denoting loosening or freeing up	Greek; freeing	Dialysis

### 6.3 Suffixes used for symptomatology

Suffix	Suffix Meaning	Origin; Etymology	Examples
-algia	Pain	Greek; hurt	Neuralgia
-itis	Inflammation	Greek; flaring	Laryngitis
-penia	Denotes a deficiency or lack	Greek; without	Lymphopenia
-pepsia	Denotes something relating to digestion, or the digestive tract.	Greek; to digest	Dyspepsia
-phagia	Denoting conditions relating to eating or ingestion	Greek; to eat	Polyphagia
-rhea	Flowing through	Greek; breakout	Diarrhea

## 7. Examples

Students should first learn to examine the whole medical word and then break it down into its various parts. For example, the term “pancytopenia” should first be broken down into its component parts - “Pan-cyto-penia” - and then the meaning can be determined. In this example, “pan” means all or total, “cyto” refers to cells, and “penia” indicates a deficiency. So the definition of pancytopenia is a deficiency of all



blood cells.

For another example, “lipodystrophy” can be broken down into “lipo” referring to fat, “trophy” is about growth or development, and “dys” here means an abnormality. Therefore, lipodystrophy can now be understood as an abnormal development of fat.

Another approach involves breaking down the medical term by evaluating the meaning of the suffix first, then prefix, and finally the word root. This will generally produce a reasonable understanding of the term’s meaning. Of course, when in doubt, the result should be verified by a medical terminology dictionary.

Finally, students need to be aware of another general rule of medical terminology. That is, when more than one body part is used in the formation of a medical term, the individual word roots are joined together by using the combining form using the letter “o” to indicate the joining together of various body parts. For example, an inflammation of the stomach and intestines would be written as *gastro* and *enter* plus *itis* to form the term “gastroenteritis”. In this example, the “o” signals the joining together of the two body parts.

## 8. Conclusion

Being able to decoding medical term is an important skill that medical students need to master early in their studies. Once students gain experience in the process of examining and decoding medical terminology, the process begins to make sense and becomes easier. Although the process of learning medical terminology is challenging, as with any new language, it is an attainable goal once the basic rules are learned and put into practice.

## Notes

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