Introduction to Medical Terminology

Medical Term: fundamentals

- Most medical terms are derived from Greek and Latin language, which means that two different roots may have the same meaning, e.g. dermatos (Greek word) and the cutane (Latin word) both refer to the skin.

- A medical word consists of some or all of the following elements:
     - Medical roots
     - Combining Form
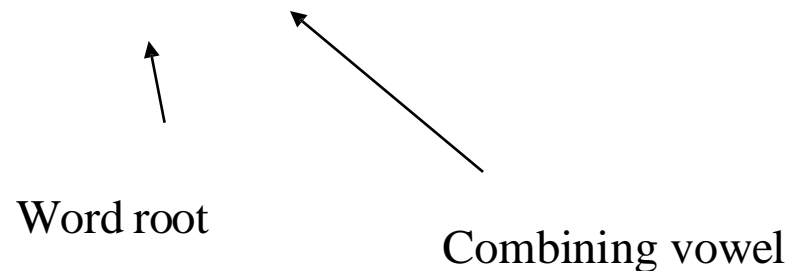   - Prefix
     - Suffix

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1-Term Root

- It is the main part of the medical term and which carries its primary meaning (**Greek roots** are used for building up the words that describe **a disease, condition, treatment, or diagnosis**, while, **Latin roots** are used to build up words that describe **anatomical structures**).

- It can appear at the beginning of a word, after a prefix, before a suffix, or between a prefix and a suffix.

- All terms have at least one word root.

- A word root may be used alone or combined with other elements to form a complete word.

- Examples of Medical roots

- "stomat" means mouth (Greek)   "or" means mouth (Latin)

- "dermat" means skin (Greek)   "cutane" means skin (Latin)

- "nephr" means kidney (Greek)   "ren" means kidney (Latin)

2- Combining Form

- A **combining form** is the combination of the word root and the combining vowel which could be an **o**, but sometimes it is an **i** to make the **word roots pronunciation easier**.
- The combining vowel **has no meaning of its own**, but **enables two word elements to be connected**.
- A combining form is presented as word root/vowel (such as gastr/o).
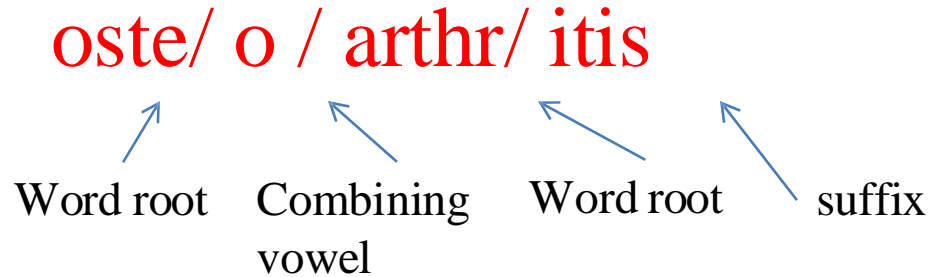
i.e.   gastr / o   pronounced   GASTRO.

Word root

Combining vowel

- When a word has more than one root, a combining vowel is used to link the root to each other.

i.e.   osteoarthritis

oste/ o / arthr/ itis

Word root   Combining   Word root   suffix
             vowel

Examples of Combining Forms

This table illustrates how word roots and vowels create combining forms. Learning combining forms rather than word roots makes pronunciation a little easier because of the terminal vowel. For example, in the table below, the word roots gastr and nephr are difficult to pronounce, whereas their combining forms gastr/o and nephr/o are easier to pronounce.

Word Root	+	Vowel	=	Combining Form	Meaning
erythr/	+	o	=	erythr/o	red
gastr/	+	o	=	gastr/o	stomach
hepat/	+	o	=	hepat/o	liver
immun/	+	o	=	immun/o	immune, immunity, safe
nephr/	+	o	=	nephr/o	kidney
oste/	+	o	=	oste/o	bone

3- Suffix

- A suffix (**derived from Greek or Latin words**) is composed of **one or more letters added to the END of a word root or combining form to modify its meaning**, it describes a **pathology** (**disease or abnormality**), **symptom, surgical or diagnostic procedure**, or part of speech.

Examples of Suffixes

This table lists examples of pathological suffixes as well as their phonetic pronunciations. Begin learning the pronunciations as you review the information below.

Combining Form	+	Suffix	=	Medical Word	Meaning
	+	-itis (inflammation)	=	gastritis găs-TRĪ-tĭs	inflammation of the stomach
gastr/o (stomach)	+	-megaly (enlargement)	=	gastromegaly găs-trō-MĔG-ă-lē	enlargement of the stomach
	+	-oma (tumor)	=	gastroma găs-TRŌ-mă	tumor of the stomach
	+	-itis (inflammation)	=	hepatitis hĕp-ă-TĪ-tĭs	inflammation of the liver
hepat/o (liver)	+	-megaly (enlargement)	=	hepatomegaly hĕp-ă-tō-MĔG-ă-lē	enlargement of the liver
	+	-oma (tumor)	=	hepatoma hĕp-ă-TŌ-mă	tumor of the liver

Building Medical Words

There are three basic rules for building medical words.

Rule I

A word root links a suffix that begins with a vowel.

Rule II

A combining form (root o) links a suffix that begins with a consonant.

Rule III

- A combining form links a root to another root to form a compound word.

- This rule holds true even if the next root begins with a vowel, as in osteoarthritis.

- Keep in mind that the rules for linking multiple roots to

    each other are slightly different from the rules for

    linking roots and combining forms to suffixes.

Rule 1

Word Root	+	Suffix	=	Medical Word	Meaning
hepat	+	-itis	=	hepatitis	inflammation of the liver
liver		inflammation		hĕp-ă-TĪ-tĭs	

Rule 2

Combining Form	+	Suffix	=	Medical Word	Meaning
hepat/o	+	-cyte	=	hepatocyte	liver cell
liver		cell		HĔP-ă-tō-sīt	

Rule 3

Combining Form	+	Word Root	+	Suffix	=	Medical Word	Meaning
oste/o (bone)	+	chondr cartilage	+	-itis inflammation	=	osteochondritis ŏs-tē-ō-kŏn-DRĪ-tĭs	inflammation of bone and cartilage
		arthr joint	+	-itis inflammation	=	osteoarthritis ŏs-tē-ō-ăr-THRĪ-tĭs	inflammation of bone and joint

Meanings of certain suffixes

- scope (instrument to view)   - rrhexis (rupture)

- rrhea   (excessive flow or discharge)   - toxic (poison)

 - stenosis (narrowing, stricture)   - pathy (disease)

All begin with a consonant, therefore a combining vowel must be
    used between the word root and the suffix.

- algia   (pain)   - edema (swelling)

- uria   (urine, urination)   - osis (abnormal condition)

- ectomy   (excision)

These suffixes begin with a vowel, therefore a combining vowel is
    NOT used between the word root and the suffix.

4- Prefix

- A prefix is a syllable or syllables attached to the beginning of a word or word root to alter its meaning or create a new word.

- Not all medical terms have a prefix.

- The prefix usually indicates a number, time, position, direction, or negation, absence). Many of the same prefixes used in medical terminology are also used in the English language.

Anti- (against)	Epi- (above)	Epi- (above)
Hyper- (excessive)	hemi- (half)	inter- (between)
Pre- (before)	bi- (two)	retro- (behind)
Post- (after)	tri- (three)	macro- (large)
Homo- (same)	mono- (one)	micro- (small)
Hetero- (different)	Hypo- (under)	multi- (much)
Eu- (normal)	para- (beside)	ab- (away from)
Dys- (painful)	Intra –(within)	ad –(within)
Brady- (slow	Endo- (within)	Endo- (toward)
	Ecto –(outside)	circum– (around)

Examples of Prefixes

This table lists examples of prefixes as well as their phonetic pronunciations. Begin learning the pronunciations as you review the information below.

Prefix	+	Word Root	+	Suffix	=	Medical Word	Meaning
an- (without, not)	+	esthes (feeling)	+	-ia (condition)	=	anesthesia ăn-ĕs-THĒ-zē-ă	condition of not feeling
hyper- (excessive, above normal)	+	therm (heat)	+	-ia (condition)	=	hyperthermia hī-pĕr-THĔR-mē-ă	condition of excessive heat
intra- (in, within)	+	muscul (muscle)	+	-ar (pertaining to)	=	intramuscular ĭn-tră-MŬS-kū-lăr	pertaining to within the muscle
para- (near, beside; beyond)	+	nas (nose)	+	-al (pertaining to)	=	paranasal păr-ă-NĀ-săl	pertaining to (area) near the nose
poly- many, much	+	ur (urine)	+	-ia (condition)	=	polyuria pŏl-ē-Ū-rē-ă	condition of much urine

Changing Prefixes and Meanings

In this table, each word has the same root, nat (birth) and suffix, -al (pertaining to). By substituting different prefixes, new words with different meanings are formed.

Prefix	+	Word Root	+	Suffix	=	Medical Word	Meaning
pre- (before)	+				=	prenatal prē-NĀ-tăl	pertaining to (the period) before birth
peri (around)	+	nat (birth	+	-al (pertaining to)	=	perinatal pĕr-ĭ-NĀ-tăl	pertaining to (the period) around birth
post (after)	+				=	postnatal pōst-NĀ-tăl	pertaining to (the period) after birth

Medical term Interpretation

It can be done by defining the term components (1- suffix, or last part of the word, 2- the first part of the word (which may be a word root, combining form, or prefix), 3- the middle parts of the word.

Examples:

Acrocyanosis

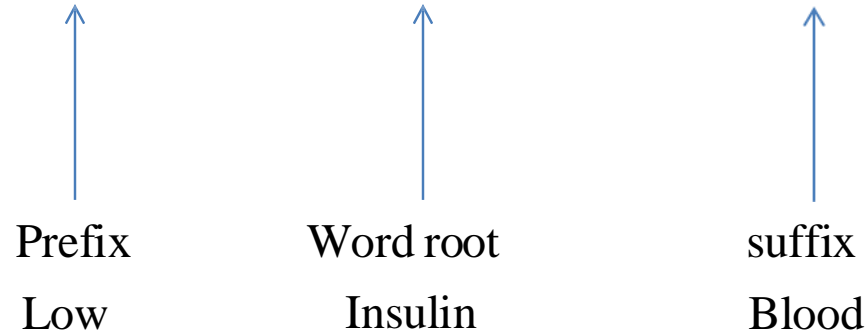Acr (word root = extremities)

cyan (word root = blue)

/ o / = combining vowel

- osis (suffix = condition)

So, Acrocyanosis = a condition characterized by blue extremities

Hypoinsulinemia

Hypo / insulin / emia

Prefix	Word root	suffix
Low	Insulin	Blood

In this example, there is no combining vowel in this word because the prefix ends with a vowel and the suffix begins with a vowel.

Plural words

Are formed by adding or substituting another vowel or syllable at the end of a word (i.e. suffix).

Examples

- macula – the plural is maculae

- adenoma – the plural is adenomata

- glomerulus – the plural is glomeruli

- ovum – the plural is ova

- spermatozoon – the plural is spermatozoa

Rules for Singular and Plural Suffixes

This table presents common singular suffixes, the rules for forming plurals, and examples of each.

Rule		Example	
Singular	Plural	Singular	Plural
–a	Retain *a* and add *e*.	pleur*a*	pleur*ae*
–ax	Drop *x* and add *ces*.	thor*ax*	thor*aces*
–en	Drop *en* and add *ina*.	lum*en*	lum*ina*
–is	Drop *is* and add *es*.	diagnos*is*	diagnos*es*
–ix	Drop *ix* and add *ices*.	append*ix*	append*ices*
–ex	Drop *ex* and add *ices*.	ap*ex*	ap*ices*
–ma	Retain *ma* and add *ta*.	carcino*ma*	carcino*mata*
–on	Drop *on* and add *a*.	gangli*on*	gangli*a*
–um	Drop *um* and add *a*.	bacteri*um*	bacteri*a*
–us	Drop *us* and add *i*.	bronch*us*	bronch*i*
–y	Drop *y* and add *ies*.	deformit*y*	deformit*ies*

Eponyms

Eponyms are medical terms derived from the name of a person. Many procedures and tests are also named after the person who invented or perfected them.

Examples of diseases;

- Addison's disease
- Alzheimer's disease
- Cushing's disease
- Parkinson's disease
- Stokes-Adam's syndrome

Examples of body parts;

- Bowman capsules
- Cowper's glands
- Wernicke's center or area

Examples of tools;

- Foleys catheter
- Hegar dilators

Acronyms

Acronyms are medical abbreviations. They are used very frequently in medicine. They boost efficiency as long as they are used intelligently.

Examples;

- ACE ------ angiotensin converting enzyme
- ACTH ----- adrenocorticotropic hormone
- AIDS ----- acquired immune deficiency syndrome
- HDL ----- high density lipoprotein
- Hx ----- history
- MI ----- myocardial infarction
- RBC ----- red blood cells
- RBBB ----- right bundle branch block
- TB ----- tuberculosis
- ADH ----- anti-diuretic hormone