

TERMINOLOGY

PREFIXES + ROOTS + SUFFIXES

➤ PREFIXES

1. Prefixes denoting Quantity or Number

Prefix	Meaning	Example
a- an-	without	anemia
bi-	two, double	bifurcation
di-	two, twice	diatomic (having two atoms)
hemi-	half	hemisection
cent-	hundred	centimeter
deca(i)-	ten	decibel
holo-	all	holistic
mon/o-	one	monomer
multi-	many	multicellular (consisting of many cells)
poly-	many	polymerization
prim-/i-	first	primary
quad-/quat-	four	quadrant
semi-	half	semiluminal
tri-	three	trigeminal
uni-	one	unilateral

Exercise 1

Underline the prefixes used in the following words and specify what number or amount each represents:

- | | |
|---|---|
| <p>1. anaerobic _____ oxygen/s</p> <p>2. hemisphere _____ sphere/s</p> <p>3. quaternary _____ element/s</p> <p>4. primordial _____ form/s</p> <p>5. anesthesia _____ feeling/s</p> <p>6. monocular _____ eyepiece/s</p> <p>7. anemia _____ hemoglobin/s</p> <p>8. bicuspid _____ cusp/s</p> | <p>9. tripod _____ foot/feet</p> <p>10. polypnea _____ breath/s</p> <p>11. unilateral _____ side/s</p> <p>12. trifurcation _____ division/s</p> <p>13. semicoma _____ coma/s</p> <p>14. decimeter _____ meter/s</p> <p>15. monocell _____ cell/s</p> |
|---|---|

2. Prefixes denoting Color

Prefix	Color	Example
albus-	white	albumen
chlor-/o-	green	chlorophyll

cyan-/o-	blue	cyanosis (bluish discoloration of the skin due to lack of oxygen)
erythr-/o-	red	erythrocyte (red blood cell)
leuk-/o-	white	leukoplakia leukemia (cancer of white blood cells)
melan-/o-	black	melanoma
xanth-/o-	yellow	xanthoma (yellow growth on the skin)

A root occasionally has more than one prefix with the same meaning. One meaning may stem from Latin and another may be a Greek or French version. For example, **alba**, from the Latin word **albus**, refers to **white**, such as in **albumen** and **albino**. **Leuko** is a Greek prefix meaning **white** and is used in **leukoplakia** (a white, precancerous patch found inside the cheek). Although **leuko** may be more popular, both prefixes are correct.

Exercise 2

Match each prefix in Column A with the color it represents in Column B. (An answer in Column B may be used more than once.)

Column A	Column B
_____ melan-/o-	A. white
_____ cyan-/o-	B. yellow
_____ chlor-/o-	C. violet
_____ erythr-/o-	D. blue
_____ leuk-/o-	E. black
_____ alba-	F. red
_____ xanth-/o-	G. green

3. Prefixes denoting Size or Degree

Some prefixes are used to qualify the size or degree of development of the root term.

Prefix	Meaning	Example
hyper-	over, excess, abnormally high, increased	hypertrophy hyperthermia (high body temperature)
hypo-	under, below, abnormally low, decreased	hypoplasia hyposecretion (underproduction of a substance)
iso-	equal, same	isograft isocellular (composed of similar cells)
macro-	large, abnormally large	macrodonia
micro-	small, minute	microbe
normo-	normal	normovolemia (normal blood volume)

ortho-	straight, correct, upright	orthodontics (branch of dentistry concerned with correction and straightening of the teeth)
pan-	all around	panoramic pandemic (disease affecting an entire population)
pseudo-	false	pseudoplegia (false paralysis)
re-	again, back	reflux (backward flow)
ultra-	extreme, beyond	ultrasonic

Exercise 3

Give the meaning of the prefix underlined in the following words:

- 1- macroglossia= _____ tongue
 2- isocoria = _____ pupil size
 3- hyperglycemia= _____ blood sugar
 4- hypocementosis= _____ cementum
 5- micrognathia= _____ jaw
 6- panoramic = _____ view
 7- ultrasonic = _____ sounds

4. Prefixes denoting Location or Direction

Some prefixes are used to specify the location or the position of the root term and the involvement occurring, such as treatment occurring inside (**endo**) the tooth or treatment around (**peri**) the gingiva.

Prefix	Meaning	Example
ab-	away from	absent abduct (to move away from the midline)
ad-	toward/near	adjacent adduct (to move toward the midline)
ambi-	both sides	ambidextrous
ana-	apart	analysis
ante-	in front	anterior
de-	down from, without, removal, loss	dehydration decalcify (remove calcium from)
dexi- dextr/o-	right side	dexter dextrocardia (Condition in which the heart is displaced to the right)
dia-	complete, through	dialysis
ecto-	outside	ectopic
endo-	in, within	endodontic
epi-	upon/over	epidermis
ex/o-	out from, away from, outside	excretion
in-	into/in	incision
infra-	below	infraorbital
inter-	in midst of	interdental
im-	into/position	implant

mes-/o-	middle, among	mesioclusion
para-	near/beside	parenteral
peri-/o-	around	periodontal
post-	after/later	posterior
pre-/ante-	before	premolar
retro-	behind/back	retromolar
sub-	under, lesser	subdermal
supra-	above/over	supraorbital
syn-	together	synergism
trans-	through	transplant

Exercise 4

Using the prefix list given, choose the prefix that best describes the meaning of the term:

ab-, ad-, ambi-, ana-, de-, dext-, dia-, ecto-, endo-, ex-, in-, mes-, peri-, post-, pre-, retro-, sub-, supra-, syn-, trans-

- | | | |
|----------------------|------------------------|-----------------------|
| 1. around = _____ | 8. through = _____ | 15. into = _____ |
| 2. outside = _____ | 9. together = _____ | 16. away from = _____ |
| 3. behind = _____ | 10. down from = _____ | 17. out from = _____ |
| 4. under = _____ | 11. right = _____ | 18. within = _____ |
| 5. toward = _____ | 12. after = _____ | 19. above = _____ |
| 6. mid/among = _____ | 13. before = _____ | 20. complete = _____ |
| 7. apart = _____ | 14. both sides = _____ | |

5. Prefixes denoting Condition

Some prefixes are used to denote the condition of the root element. These prefixes may indicate that the condition is new (**neo**) or that the root term is not in effect, as in the word **infertile** (not fertile).

Prefix	Meaning	Example
a-, an-	not, without, lack of, absence	anodontia anhydrous (lacking water)
anti-	opposite to, against	antiseptic (agent used to prevent infection)
brady-	slow	bradycardia
con-	with	connective
contra-	against, opposite	contrangle
dis-	take away, absence, removal, separation	disinfectant
in-	not	insoluble
mal-	bad	malocclusion
malaco-	soft	malacosis

neo-	new	neoplasm
pachy-	thick	pachyderma
sclero-	hard	scleroma
tachy-	fast	tachycardia
un-	non/not	unerupted

Exercise 5

Match the prefix in Column A to the term it best describes in Column B:

Column A	Column B
1) neo-	a) soft
2) pachy-	b) bad
3) con-	c) without
4) sclero-	d) against
5) dis-	e) hard
6) a- or an-	f) fast
7) mal-	g) opposite to
8) anti-	h) not/non
9) un- or in-	i) new
10) tacky-	j) removal
11) contra-	k) with
12) malaco-	l) slow
13) brady-	m) thick

➤ **ROOT WORD**

Common Dental Root/Combining Forms			
Root Word	Sounds Like	Combo Form	Pertains To
alveolar	(al-VEE-oh-lar)	alveo	alveolus
apical	(AY-pih-kahl)	apic-/o-	apex of a root
axis	(ACK-sis)	ax-/o-	axis/midline
buccal	(BUCK-ahl)	bucc-/o-	cheek
cheilo	(key-LOH)	cheil-/o-	lip
coronal	(kor-OH-nal)	coron-/o-	crown
dens	(denz)	dent-/o-	tooth
distal	(DIS-tal)	dist-/o-	farthest from center
enamel	(ee-NAM-el)	ename-/o- or amel-/o-	tooth, enamel tissue
fluoride	(FLOOR-eyed)	fluor-/o-	chemical, fluoride
frenum	(FREE-num)	frene-	frenum
front	(front)	front-/o-	forehead

gingiva	(JIN -jih-vah)	gingiv-/o-	gingiva, gum tissue
glossa	(GLOSS -ah)	gloss-/o- or gloss/a	tongue
gnatho	(nah- TH -oh)	gnath-/o-	jaw, cheek
incisor	(in- SIGH -zore)	incis-/o-	incisor tooth
labia	(LAY -bee-ah)	labi-/o-	lip area
lingua	(LING -wa)	lingu-/o-	tongue
mandible	(MAN -dih-bull)	mandibu-/a-	lower jaw
maxilla	(MACK -sih-lah)	maxilla-/o-	upper jaw
mesial	(ME -zee-al)	mesi-/o-	middle, midplane
mucosa	(myou- KOH -sah)	muc-/o-	tissue lining an orifice
occlude	(oh- KLUDE)	occlus-/o-	occluding, jaw close
odont	(oh- DONT)	odont-/o-	tooth
orthos	(OR -thohs)	orth-/o-	straight, proper order
stoma	(STOW -mah)	stoma-	mouth
temporal	(TEM -pore-al)	tempor-/o-	temporal bone

Exercise 6

Place a root element for the given words in the blanks provided.

- | | |
|--------------------------|--------------------------------|
| 1. gum tissue _____ | 2. lip area _____ |
| 3. root apex _____ | 4. tongue _____ |
| 5. upper jaw _____ | 6. mouth opening _____ |
| 7. middle _____ | 8. orifice tissue lining _____ |
| 9. far from center _____ | 10. crown area _____ |

➤ SUFFIXES

Word endings can act as an adjective or indicate time and size, condition, agents, or specialists. Suffixes used as adjectives are word endings that describe or show a relationship. Suffixes have the ability to transform a noun or verb into an adjective, or verbs into nouns, by the addition of a word ending.

1. Suffixes in Adjective Use

The suffixes below are all adjective endings that mean “pertaining to,” “like,” or “resembling”. There are no rules for which ending to use for a given noun. Familiarity comes with practice.

Suffix	Shows Relation to the Root	Sounds Like
-ac	cardiac (heart)	(CAR -dee-ack)
-al	gingival (gum tissue)	(JIN -jah-val)
-ar	alveolar (alveolus)	(al- VEE -oh-lar)
-ary	maxillary (maxilla)	(MACK -sih- lair -ee)

-eal	pharyngeal (pharynx)	(fare- IN -gee-al)
-form	fusiform (spindle shape)	(FEW -zah-form)
-gram	radiogram (X-ray)	(RAY -dee-oh-gram)
-graphy	sialography (saliva measurement)	(sigh -ah- LOG -raph-fee)
-ic or tic	cariogenic (start of decay)	(CARE -ee-oh- jen -ick)
-ior	posterior (in the rear)	(pahs- TEE -ree-or)
-oid	coronoid (crown)	(KOR -oh-noyd)
-ous	venous (vein)	(VEE -nus)

Exercise 7

Underline the suffix indicating relationship in each given word, and write it in the blank next to the word.

- | | |
|--------------------|----------------------------|
| 1. filliform _____ | 7. vascular _____ |
| 2. chronic _____ | 8. squamous _____ |
| 3. kilogram _____ | 9. apical _____ |
| 4. condyloid _____ | 10. cardiac _____ |
| 5. endosteal _____ | 11. xenograph _____ |
| 6. posterior _____ | 12. intraligamentary _____ |

2. Suffixes indicating Condition

A suffix added to a root may indicate the condition of the root foundation. It may denote that disease (*pathy*) or inflammation (*itis*) occurs, or it may merely indicate that the condition exists (*tion*).

Suffix	Condition of Root Foundation	Sounds Like
-ant	etchant (etching)	(ET -chent)
-cle	vesicle (small blister)	(VES -ee-kal)
-ule	molecule (small bit of matter)	(MALL -ah-cule)
-ia	anesthesia (without feeling) dementia (loss of 'de-' intellectual function/ from L. mentis: mind)	(an -es- THEE -zee-ah) (de- MEN -she-ah)
-ible, -ile	reversible (change to or fro)	(re- VERSE -able)
-id	cuspid (cusp shape)	(CUSS -pid)
-ion	occlusion (bite)	(oh- CLUE -shun)
-ism	bruxism (tooth grinding)	(BRUCKS -ism)
-itis	arthritis (joint inflammation)	(ar- THRI -tis)
-ity	acidity (acid)	(ah- SID -a-tee)
-ium	bacterium (germ)	(back- TIER -ee-um)
-olus	alveolus (air sac)	(al- VEE -oh-lus)
-oma	lipoma (fat tumor)	(la- POE -mah)

-pathy	myopathy (muscle disease)	(MY-oh-path-ee)
-sion	incision (surgical cut)	(in-SIZH-un)
-sis	thrombosis (having a blood clot 'thrombus' in a vessel)	(throm-BO-sis)
-tic	necrotic (dead tissue)	(neh-KRAH-tic)
-tion	mastication (chewing)	(mass-tah-KAY-shun)
-y	slurry (plaster water mix) atony (lack 'a-' of muscle tone)	(SLUR-ee) (AT-o-ne)

Exercise 8

Insert the correct suffix to complete the root element.

- 1) condition of being acid = acid_____
- 2) surgical cut = inci_____
- 3) term for a germ = bacter____
- 4) fatty tumor = lip _____
- 5) act of chewing = mastica__
- 6) dead tissue = necro_____
- 7) muscle damage disease = myo_____
- 8) small bit of matter = a mole____
- 9) tooth grinding = brux_____
- 10) air sac = alve_____

3. Suffixes denoting Agent or Person concerned

Some suffixes are added to the root element to indicate an agent or a person concerned with or trained in that specialty.

Suffix	Agent or Person
-ee	trainee, employee, leasee
-ent	patient, recipient, resident
-eon	surgeon
-er	subscriber, examiner, practitioner
-ician	physician
-ist	dentist, orthodontist
-or	doctor, donor

4. Suffixes expressing Medical Terms, Processes, Uses

Some suffixes are added to root elements to show processes, uses, or healing. When analyzing a long dental word, starting at the suffix may indicate something happening to the root element, such as *ectomy* (surgical removal) or *trophy* (development). Other suffixes are added to indicate pain (*algia*) or bleeding (*rrhage*) and so on.

Suffix	Meaning	Sample Words
-algia	pain	odontalgia, neuralgia, myalgia
-ate, -ize	use/action	vaccinate, luxate, palpate, visualize
-cide	kill	germicide, homicide
-cyte	cell	leukocyte, osteocyte
-ectomy	surgical removal	apicoectomy, appendectomy
-gnosis	knowledge	prognosis, diagnosis
-ology	study of	histology, biology
-oma	tumor	carcinoma
-opsy	view	biopsy, autopsy
-phobia	dread fear	claustrophobia
-plasty	surgical repair	gingivoplasty
-plegia	paralysis	paraplegia
-rrhea	discharge	hemorrhage, sialorrhage
-scope	instrument	microscope (micro), laryngoscope (larynx)
-tomy	incision	myotomy (muscle)
-trophy	development	osteotrophy (bone development)

Exercise 9

Examine the boldfaced words in each sentence, and circle the suffix denoting a medical procedure, use, or condition of the root element. Then write the meaning of the word.

- 1) A **gingivoplasty** may be the correct treatment for an infected third molar area.
- 2) The patient's health history included drugs for her **fibromyalgia** condition.
- 3) The assistant prepares the **germicide** according to the manufacturer's instructions.
- 4) A **stethoscope** is used to determine blood flow sounds in a blood pressure examination.
- 5) Tissue **hemorrhage** may be an indicator of a serious blood disease.
- 6) The dentist will **cauterize** the patient's gingiva during the surgical procedure.
- 7) Jimmy will need a **frenectomy** before the central incisors can be moved into the area.
- 8) The patient was referred to an oral surgeon for the **apicoectomy**.
- 9) To avoid bone and tooth damage, the dentist will **rotate** the tooth before removal.
- 10) Some patients claim to suffer **claustrophobia** when visiting the dental office.
- 11) A complete dental exam includes inspection for oral **carcinoma** symptoms.
- 12) The patient was anxious to hear a good **prognosis** from the dentist.
- 13) The assistant prepared the **biopsy** slide for shipment to the laboratory.
- 14) An infection could be the cause of an elevated **leukocyte** count.
- 15) **Histology** is the study of microscopic structure of tissue.

5. Plurals

Because much of the medical terminology originates from Latin and Greek, the rules for changing terms from singular to plural are predetermined by the conventions of those languages. Occasionally, we find English plural terms and, whenever possible, encourage the use of these endings. The standard method to understand plural forms of words is to learn the basic rules for

changing word endings, bearing in mind that a few terms will not conform to these rules. Look terms up in a dictionary or reference book to verify spelling on any terms in question.

Guideline for Plural Forms			
Word Endings	Change To	Singular	Plural
a	<i>ae</i> (add <i>e</i> to end)	gingiva	gingivae
ex, ix	<i>ices</i> (drop <i>x</i> , add <i>ices</i>)	apex	apices
ax	<i>aces</i> (drop <i>x</i> , add <i>aces</i>)	thorax	thoraces
en	<i>ina</i> (change <i>en</i> to <i>ina</i>)	lumen	lumina
itis	<i>ides</i> (drop <i>s</i> , add <i>des</i>)	pulpitis	pulpitides
is	<i>es</i> (change <i>is</i> to <i>es</i>)	cementosis	cementoses
nx	<i>nges</i> (change <i>nx</i> to <i>nges</i>)	larynx	larynges
on	<i>a</i> (change <i>on</i> to <i>a</i>)	ganglion	ganglia
ma	<i>mata</i> (add <i>ta</i> to the end) <i>mas</i> (add <i>s</i> to the end)	dentinoma	dentinomata dentinomas
um	<i>a</i> (change <i>um</i> to <i>a</i>)	frenum	frena
us	<i>i</i> (change <i>us</i> to <i>i</i>)	sulcus	sulci
y	<i>ies</i> (drop <i>y</i> , add <i>ies</i>)	biopsy	biopsies

Exercise 10

Provide the plural form for each singular word listed here:

- | | | | | |
|-----------|-------------|--------------|------------|-----------|
| 1. matrix | 2. mamelon | 3. frenum | 4. radius | 5. sulcus |
| 6. iris | 7. axillary | 8. diagnosis | 9. gingiva | 10. stoma |

REMEMBER...

- Root:** The foundation of the term.
- Prefix:** The word beginning.
- Suffix:** The word ending.
- Combining vowel:** A vowel that links the root word to the suffix or to other root words.
- Combining form:** A combination of the root word(s) and the combining vowel.

➤ The rules for building medical words from these elements are:

- A prefix is always placed at the beginning of the word.
- A suffix is always placed at the end of the word.
- When more than one root word is used, it is a compound word and requires the use of a combining vowel to separate the words, even if the root word begins with a vowel:

Osteoarthritis

Root 1: Oste/o = Bone

Root 2: Arthr/o = Joint

Suffix: -itis = Inflammation

Combining Vowel: "o" used between Oste- and Arthr-

Definition: Inflammation of the bones and joints.

Combining vowel "o" is retained for ease of pronunciation.

4. When defining medical terms, begin with the suffix and read backward:

Cardiomegaly

Suffix: -megaly = Enlargement

Root Word: Cardio = Heart

Definition: Enlargement of the heart.

5. If the word also contains a prefix, define the suffix first, prefix second, and root word(s) last:

Tachycardia

Suffix: -ia = Condition

Prefix: Tachy- = Fast

Root Word: Card = Heart

Definition: A condition of a fast heartbeat.

6. When using compound words that relate to parts of the body, anatomic position determines which root word comes first:

Gastroenteritis

Root 1: Gastr/o = Stomach

Root 2: Enter/o = Intestine

Suffix: -itis = Inflammation

Definition: Inflammation of the stomach and intestines.

The stomach is anatomically above (superior to) the intestines, so gastr- comes first.