


Basic Medical English

刘丽娟 辛铜川 编著

基础医学 英语



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Preface

In the 15 years of teaching medical English I have frequently felt the pressing need for an appropriate textbook, either practical and effective in a classroom setting or helpful as a self-taught tool for a motivated student with little or no supervision. Sponsored two years ago by the Teaching Affairs Department of Jinan University, the textbook “Basic Medical English” has finally come into being, with its mission to provide the basics of medical language for medical students.

This book, developed from teaching experience, has several features that distinguish it from other textbooks in that a comprehensive introduction to the formation of medical terminology, and various examples and supporting exercises that are practical and helpful, are provided for both the instructor and the student.

Chapter One introduces briefly the etiology of English language and that of medical English. One of the characteristics of medical language “one word in three forms” is presented in this chapter.

Chapter Two and Three provide a foundation for the formation of medical terminology. It begins with the word parts or word elements: roots, prefixes, suffixes, combining vowels and combining forms, followed by a simple way of translating a medical term into English. The most commonly used word parts are listed within these two chapters.

Chapter Four through fifteen present special medical terms related to body systems. Each chapter begins with a short brief passage, acting as a platform for the entry of a certain body system, mainly the introduction to the structure and function of this body system. The word parts, the medical terms, surgical terms, and terms of disease and disorders, all of which are related to this body system, are arranged after the passage. The chapter ends with various exercises, enabling students to reinforce what they've learned in the preceding parts and thus easily recognize or even build medical terms themselves. Keys to exercises are provided for students to monitor their own learning.

In presenting this textbook, I wish that medical students, through a one-semester course, will not feel that recognizing medical terms is so difficult as they first appear, especially with those compound words consisting of joined Greek or Latin word roots, prefixes, suffixes and combining forms, and that by learning some simple ways of analyzing the language of medicine, they are sure to understand the meaning of medical terms, or perhaps become much interested in even trying to form their own medical terms.

I am grateful to many individuals who assisted me in such a frivolous undertaking as mine,

and I cannot miss this opportunity to thank them. My special thanks first go to Professor Xin Tongchuan, a co-compiler of this book, who has contributed a lot to this book with his teaching experience, enthusiasm, and generosity. I especially appreciate the contribution of Professor Fan Rongqiang, my beloved husband, who has helped me a lot with his wisdom and constructive suggestion. Thanks also to Professor Lin Keqi and her husband Robert J Costantino, and to Professor Gong Qi with his continuous help, and to Nadeem Anjum, an overseas student of mine from Pakistan, who reviewed the manuscript and gave his time and effort to finding out some suitable figures for the book. Last, but by no means least, I would like to express my gratitude to my students who, over the years, have followed my instruction and acquired the language of medicine through my immature, exploratory hands-out, the embryonic form of this textbook.

刘丽娟

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Chapter One

A Brief Introduction to Medical Terminology

The English language of today reflects many centuries of development. It is difficult to say from which language or languages the English language evolved, yet Anglo-Saxon, the language spoken by the three Germanic tribes, the Angles, Saxons, and Jutes, who invaded the British Isles and made their settlement there in the fifth and sixth centuries, has undoubtedly exerted great influence on English language. The language brought with the invaders developed into what we know as Old English, the core of English language. Today we feel that this ancient language is still with us from some of the medical terms denoting anatomic structures, organs, substances, and basic concepts of human activities—**hand, foot, arm, heart, eye, bone, liver, lung, neck, breath, mind**, etc. While these ancient medical terms are far less in number than those compounds derived from Greek and Latin, these one-syllable words are of high frequency in use as basis of medical terminology. What is more, they are well understood and much easier memorized.

When talking about medical terminology, two languages—Greek and Latin, which are of paramount importance in contributing to the establishment of modern medical terminology, cannot but be mentioned. In Europe, Greek culture has a longer history than that of Latin and a great many Latin terms came from Greek. In ancient Greece, to be exact, in Hippocrates (460 BC – 377 BC) time, medical practitioners already had some knowledge on anatomy and human body; while their understanding of the anatomic structures of human body was not comprehensive and without all-side view, what they founded as medical terminology—concise, consistent, and clear was conveyed to the outside world and finally accepted by many nations. Soon after the Renaissance in Europe, many Greek elements were Englished and borrowed to form a great quantity of medical combining words, which resulted in the most productive of medical terminology; **colon, diagnosis, paralysis, pneumonia, psychology**, to name only a few.

The earlier influence of Latin language on medical English may date back to the Roman Empire appeared in the third century BC. Latin was the official language of Roman government. It was said that the Romans were quite skillful in medicine and that many of them knew both Greek and Latin, which explains why *medical literature is far richer in Latin and Greek elements than any other branches of learning*. With the expansion, the Romans brought their language to other parts of the world. Norman Conquest was another important event that exerted greater influence,

passing on to us more words like **acute**, **aorta**, **cell**, **medicine**, **muscle**, **tumor**, etc.

For some historical reasons, medical terminology, derived from different origins, has the elements of multiple-nation, including English, Greek, Latin, French and other languages, among which both Latin and Greek are used as sources for word bases, and the ease of word formation have resulted in a significant number of duplicate forms that are sometimes called **Competing Forms**. One characteristic of medical language called Duplication thus occurs. With three languages competing (English, Latin, Greek), it is quite common in medical terminology to use different terms to refer to the same thing. For example, English has the word **heart**, but later **core** and **cardia** entered the language as alternatives. More examples: **lingual** / **glossal**, both mean pertaining to the tongue; **dentist** / **odontologist** both denote specialist in the treatment of tooth diseases; **or** / **al**: pertaining to the mouth; **stomat** / **o** / **pathy**: diseased condition of the mouth. The following is a list of duplication or overlapping in reference:

| Chinese | English | Latin | Greek |
|---------|---------|-------------|----------|
| 体 | body | corpus | soma |
| 手 | hand | manus | cheir |
| 树 | tree | arbor | dendron |
| 金 | gold | aurum | chrysos |
| 肾 | kidney | renes | nephros |
| 脐 | navel | umbilicus | omphalos |
| 心 | heart | cor | cardia |
| 肠 | bowel | intestin | enteron |
| 光 | light | lumen | phos |
| 红 | red | rubrum | erythros |
| 血管 | vessel | vas | angeion |
| 呼吸 | breath | respiration | pneuma |
| 女性 | woman | female | gyne |
| 皮肤 | skin | derma | cutis |
| 细胞 | cell | corpuscle | cytos |
| 血液 | blood | sanquis | haima |

Chapter Two

Formation of Medical Terminology (I)

Medicine has a language of its own, or we may say that medical terminology is a sort of language, so it can be analyzed and studied like any other languages. As we mentioned in the previous chapter, medical vocabulary mainly includes terms built from Greek and Latin word parts, some of which are discarded, the meanings of others are altered, and new words are added with the advancement of medical and scientific knowledge. Still the majority of medical terms in current use are composed of Greek and Latin word parts. So to learn word parts and how they fit together to form medical terms is one of the two ways existed to learn medical terms. Memorization, though monotonous, is another way to learn some medical terms that are not built from word parts, such as **Paget's disease** or **Roentgen**. Most medical terms built from word parts consisting of some or all of the following components:

1. word roots (base)
2. prefixes
3. suffixes
4. combining vowels

1. Word Roots

The root of a medical word is the core of a word and it is capable of combining with another root or a suffix to form a medical word that has meaning. All medical terms have one or more roots. Examples:

mod / i / fy: in this word, mod is the word root.

play / er: in this word, play is the word root.

lingu / ist: in this word, lingu (which means tongue) is the word root.

labi / o / dent / al: in this word, both labi (which means lip) and dent (which means tooth) are word roots.

2. Prefixes

The prefix is a word part placed before the beginning of a word to modify the meaning of it. Many medical terms have a prefix. Examples:

re / play: in this word, re- (which means again) is the prefix, thus replay means play again.

sub / cutane / ous: in this word, sub- (which means under) is the prefix; cutane (which means skin) is the word root; and -ous (which means pertaining to) is the suffix; thus subcutaneous means beneath the skin.

hyper / glyc / emia: in this word, hyper- (which means above or excessive) is the prefix; glyc (which means sugar) is the word root; -emia (which means blood condition) is a suffix; thus hyperglycemia means excessive sugar in the blood.

hypo / tension: in this word, hypo- (which means beneath or less than normal) is the prefix; tension means pressure; thus **hypotension** means low blood pressure.

Here is a table of the most commonly used prefixes.

| Prefixes | Meaning | Examples |
|------------|---------------------|--|
| a-/an- | without; not | aphasia; the inability to understand written or spoken words or to speak meaningfully |
| ab- | away from | abortion; expulsion from the uterus |
| ad- | to; toward; near | adnasal; near the nose |
| acro- | a point or tip | acrophobia; morbid fear of heights |
| alb- | white | albino; a person lacking normal pigmentation |
| amb-/ambi- | both | ambisexual or bisexual; (person) who is sexually attracted to both males and females |
| amphi- | both; both sides | amphicentric; beginning and ending in the same vessel |
| ana- | up; back again | anabolism; process of building up complex chemical substances on the basis of simpler ones |
| angio- | a blood vessel | angioma; benign tumor formed of blood vessels |
| ante- | before | antenatal; during the period between conception and childbirth |
| anti- | against | antidepressant; (drug) used to treat depression |
| audi- | hearing; sound | audiometry; science of testing hearing |
| auto- | self | autoantibody; antibody formed to attack the body's own cells |
| bi- | two; twice | bicellular; two cells |
| bio- | living organisms | biochemistry; chemistry of living tissues |
| brady- | slow | bradycardia; slow rate of heart contraction, shown by a slow pulse rate |
| carcin- | carcinoma or cancer | carcinogen; a cancer-causing substance |
| cardi- | the heart | cardiopathy; any kind of heart disease |

| | | |
|------------|---|---|
| cata- | downwards; under; against; along with | cataract; condition where the lens of the eye gradually becomes hard and opaque |
| centi- | one hundredth | centimeter; unit of measurement of length (= one hundredth of a meter) |
| co(n)- | with or together | consanguineous; blood relationship |
| contra- | against | contraception; prevention of pregnancy by using devices or drugs |
| de- | removal or loss | decaffeinated; (coffee) with the caffeine removed |
| deca- | ten | decagram; ten grams |
| deci- | tenth | deciliter; unit of measurement of liquid (= one tenth of a litre) |
| di- | two | diglossia; a double tongue |
| dia- | through; between; apart; across completely | diathermy; process of (treating) through heat |
| dis- | reversal or separate | disintegrate; to come to pieces |
| dys- | bad; difficult; dis- ordered | dysarthrosis; deformity or malformation of a joint |
| echo- | sound | echocardiography; ultrasonography of the heart |
| ect-/ecto- | outside or outer | ectocardia; congenital displacement of the heart |
| en- | in; within | enostosis; benign growth inside a bone |
| endo- | inside | endocardium; membrane which lines the heart |
| epi- | on; over | epidermis; outer layer of skin, including the dead skin on the surface |
| ery- | red | erythrocyte; mature non-nucleated red blood cell |
| eso- | inward; within | esotropia; turning inward of the eye |
| eu- | good | eugenics; study of how to improve the human race by genetic selection |
| ex-/exo- | out of | exhale; to breathe out |
| extra- | outside | extracapsular; outside a capsule |
| hemi- | half | hemiplegia; severe paralysis affecting one side of the body |
| hydro- | water | hydrocele; collection of watery liquid found in a cavity such as the scrotum |
| hyper- | higher or too much | hyperglyc (a) emia; excess of glucose in the blood |
| hypo- | less or too little | hypokal (a) emia; deficiency of potassium in the blood |

| | | |
|-------------------|---------------------------------------|---|
| in- | in or into | inbreeding; breeding between a closely related male and female |
| in- | not | incoherent; not able to speak in a way which makes sense |
| infra- | below or beneath | infrapatellar; below or beneath the patella |
| inter- | between | interlobular; between lobules |
| intra- | inside | intramedullary; inside the bone marrow or spinal cord |
| intro- | into | introvert; person who thinks only about himself and his own mental state |
| mal- | bad or abnormal | malfuction; abnormal working of an organ |
| meta- | to change | metaplasia; change of one tissue to another |
| micro- | very small | microcyte; abnormally small red blood cell |
| mid- | middle | midcarpal; between the two rows of carpal bones |
| milli- | one thousandth | milligram; unit of measurement of weight |
| mis- | error or wrong | miscarriage; spontaneous abortion |
| multi- | many | multigravida; a woman who is pregnant and has been pregnant at least twice before |
| noct- | at night | nocturia; passing abnormally large quantity of urine when asleep in bed at night |
| nona- | nine or the ninth | nonagon; flat shape which has nine sides |
| octa- | eight | octan; every eight days |
| odont- | teeth | odontology; study of teeth and associated structures, and their disorders |
| onco- | tumors | oncology; scientific study of new growths |
| oro- | mouth | orolingual; pertaining to the mouth and tongue |
| pachy- | thickening | pachysomia; condition where soft tissues of the body become abnormally thick |
| pali-/palin- | against; pathologic repetition | palindromic; (disease) which recurs |
| pan-/pant-/panto- | all | pancytopenia; abnormal depression of all the cellular elements of the blood |
| para- | similar to or near; changed or beyond | paralyse or paralyze; to weaken (muscles) so that they cannot function |
| pen-/penta- | five | pentosuria; excretion of pentoses in the urine |
| per- | through | percutaneous; done or administered through the skin |
| peri- | around | pericystitis; inflammation of tissue around the bladder |
| pero- | deformed or defective | peromelia; congenital deformity of the limbs |

| | | |
|----------------|---------------------------------------|---|
| pharmaco- | drugs | pharmacology: study of drugs or medicines, and their action, properties and characteristics |
| pleo-/pleio- | too many | pleokaryocyte: condition where a greater than normal number of cells in cerebrospinal fluid |
| pluri- | more | pluriglandular: pertaining to or affecting several glands |
| pneum-/pneumo- | air or the lungs; breathing | pneumonia: inflammation of a lung |
| poly- | many or much; touching many organs | polyphagia: condition where a patient eats too much; morbid desire for every kind of food |
| post- | after or later | postprandial: after a meal |
| pre- | before or in front of | premature: early or before the normal time |
| presby- | old age | presbyopia: an old person's sight fails gradually |
| pro- | before or in front of | prognosis: prediction of the outcome of a disease |
| quadri- | four | quadruplet or quad: one of four babies born to a mother at the same time |
| radio- | ray or radiation | radiotherapy: treating a disease by exposing the affected part to radioactive rays |
| semi- | half | semiptosis: the downward sagging of half or part of an organ |
| sub- | under | submucous: under the mucous membrane |
| super- | above; extremely | superalbuminosis: abnormal increase of albumin |
| supra- | above; over | suprarenal: (situated) above a kidney |
| syn- | with; joint | syndesmosis: joint where the bones are tightly linked by ligaments |
| tachy- | fast | tachycardia: rapid beating of the heart |
| tetra- | four | tetracycline: antibiotic used to treat a wide range of bacterial diseases |
| trans- | across; through; beyond | transmission: the transfer, as of a disease, from one person to another |
| tri- | three | tricephalus: a fetus with three heads |
| ultra- | beyond; excess | ultrasonics: the science dealing with ultrasonic sound waves |
| uni- | one | uniglandular: affecting only one gland |
| xen (o)- | strange; foreign | xenograft: a graft of tissue transplanted between animals of different species |

Exercises

I. Match the prefixes in Column A with the definitions in Column B.

| Column A | Column B |
|-------------------|-------------------------------|
| _____ 1. a-/an- | A. toward |
| _____ 2. ab- | B. living organisms |
| _____ 3. ad- | C. between |
| _____ 4. ana- | D. at night |
| _____ 5. alb- | E. away from |
| _____ 6. ante- | F. before |
| _____ 7. dia- | G. white |
| _____ 8. endo- | H. bad; abnormal |
| _____ 9. meta- | I. inside |
| _____ 10. de- | J. removal; loss |
| _____ 11. poly- | K. ten |
| _____ 12. bio- | L. through; across completely |
| _____ 13. auto- | M. on; over |
| _____ 14. contra- | N. up; back again |
| _____ 15. mal- | O. without; not |
| _____ 16. inter- | P. against |
| _____ 17. octa- | Q. many; much |
| _____ 18. epi- | R. self |
| _____ 19. noct- | S. changes |
| _____ 20. deca- | T. eight |

II. Give the meanings of the following prefixes.

| | |
|------------------|------------------|
| 1. audi- _____ | 2. anti- _____ |
| 3. bi- _____ | 4. bio- _____ |
| 5. brady- _____ | 6. centi- _____ |
| 7. dys- _____ | 8. endo- _____ |
| 9. epi- _____ | 10. eu- _____ |
| 11. extra- _____ | 12. hemi- _____ |
| 13. hydro _____ | 14. hyper- _____ |
| 15. hypo- _____ | 16. multi- _____ |
| 17. para- _____ | 18. syn- _____ |
| 19. tachy- _____ | 20. trans- _____ |

Answers to Exercises

I.

1. O 2. E 3. A 4. N 5. G 6. F 7. L 8. I 9. S 10. J
11. Q 12. B 13. R 14. P 15. H 16. C 17. T 18. M 19. D 20. K

II.

- | | | | |
|-------------------|----------------------|----------------------|---------------------|
| 1. hearing; sound | 2. against | 3. two; twice | 4. living organisms |
| 5. slow | 6. one hundredth | 7. bad; difficult | 8. inside |
| 9. on; over | 10. good | 11. outside | 12. half |
| 13. water | 14. higher; too much | 15. less; too little | 16. many |
| 17. similar to | 18. with; joint | 19. fast | 20. across; through |

Chapter Three

Formation of Medical Terminology (II)

1. Suffix

The suffix is the ending of a word and it is attached to the end of a word root to modify its meaning. Suffixes not only alter the meaning of a word, but they also determine the various word functions, such as part of speech or whether the word is singular or plural. Most medical terms have a suffix. Examples:

mod / i / fy: in this word, -fy (the ending of the word determines that modify is a verb) is the suffix.

play / er: in this word, -er (a very active and productive suffix in modern English) is the suffix.

hepat / ic: in this word, -ic (which means pertaining to) is the suffix.

endo / crin / o / logy: in this word, -logy (which means the process of studying) is the suffix.

Medical language has two types of suffixes: simple and compound. Simple suffixes are those that have nothing added to them. For example: -er, -ic, -fy in the above examples are simple suffixes. Compound suffixes, on the other hand, are usually formed by joining a word root or base and a simple suffix. Examples:

-logy is formed by combining the word root log (study) and the simple suffix -y (condition, act, process). Hence -logy means the process of studying.

append / ectomy: -ectomy is a compound suffix. -ectomy: the prefix ec- (out), the word root tom (to cut), and the simple suffix -y (act, process). Hence -ectomy means the surgical removal, the process of cutting out, or excision.

Here is a list of commonly used simple suffixes.

| Suffixes | Meaning | Examples |
|----------|---------------|----------------------------------|
| -ac | pertaining to | cardiac: pertaining to the heart |
| -al | pertaining to | medical: pertaining to medicine |

| | | |
|----------|---|--|
| -ar | pertaining to | molecular; pertaining to a molecule |
| -ary | pertaining to; belonging to | ciliary; pertaining to the cilia |
| -ase | enzyme | amylase; any enzyme that converts starch to sugar |
| -cle | smallness | follicle; a small bodily cavity or sac |
| -e | an instrument | auriscope; an instrument for examining the ear |
| -eal | pertaining to | laryngeal; pertaining to the larynx |
| -ia | condition; quality | phobia; abnormal fear |
| -ic | pertaining to | toxic; pertaining to toxin |
| -ics | study of; name of a science | paediatrics; study of children, their development and diseases |
| -ine/-in | substance | insulin; substance (hormone) produced by the islets of Langerhans in the pancreas |
| -ism | process or condition | alcoholism; excessive drinking of alcohol which becomes addictive |
| -ist | one who specializes in | pharmacologist; a doctor who specializes in the study of drugs |
| -itis | inflammation | rhinitis; inflammation of the nasal passages |
| -(i) um | refers to a part in relation to a whole; related to | endometrium; inner lining of the uterus |
| -ive | characterized by | antitussive; a drug that suppresses coughing |
| -let | tiny; small | droplet; a tiny drop |
| -ment | the result or product of an action | development; thing which develops or is being developed; action of becoming mature |
| -oid | resembling; like | mucoïd; resembling mucus |
| -ole | little; small | centriole; the small dense structure in the middle of the centrosome |
| -oma | tumor; swelling | dermatofibroma; fibrous tumor of the skin |
| -or/-er | refers to a doer, either a person or thing | receptor; a sensory nerve ending that responds to various stimuli |
| -ory | characterized by; pertaining to | suspensory; which is hanging down |
| -ose | sugar | fructose; fruit sugar found in honey and some fruits |
| -osis | abnormal condition | onychocryptosis; abnormal condition of a hidden nail |
| -ous | pertaining to | poisonous; pertaining to poison, also containing poison |
| -somes | bodies | ribosome; the body of nucleic acid |

| | | |
|-----|--------------------------------|---|
| -um | structure; thing; substance | magnesium: a white metallic chemical substance |
| -y | condition; act; process | dystrophy: disorder caused by defective nutrition or metabolism |

The following is a list of the most commonly used compound suffixes.

| Suffixes | Meaning | Examples |
|-----------------------|---|--|
| -algia | pain; painful condition | arthralgia: pain in a joint |
| -blast | embryo | hemocytoblast: blast cell |
| -carcinoma | malignant tumor developing from connective tissue | adenocarcinoma: malignant tumor developing from glandular tissue |
| -cele | protrusion; distention | esophagocele: abnormal distention of the esophagus |
| -centesis | surgical puncture | paracentesis: surgical puncture of a cavity for the aspiration of fluid |
| -capnia | carbon dioxide | acapnia: absence of carbon dioxide |
| -cide | kill | germicide: (substances) which can kill germs |
| -clast | to break | osteoclast: cell which destroys bone |
| -clysis | washing; irrigation | bronchoclysis: irrigation of the bronchus |
| -cyte | cell | phagocyte: cell, especially a white blood cell, which can surround and destroy other cells |
| -dynia | pain | glossodynia: pain in the tongue |
| -ectasia; -ectasis | expansion; dilation | nephrectasia: distention of the kidney atelectasis: incomplete expansion of the lungs at birth |
| -ectomy | surgical excision or removal of | gastrectomy: surgical removal of the stomach |
| -edema | excessive accumulation of serous fluid | myxoedema: condition caused when the thyroid gland does not produce enough thyroid hormone |
| -emia | blood condition | leukemia: any of several malignant diseases where an abnormal number of leucocytes form in the blood |
| -emesis | vomiting | hematemesis: the vomiting of blood |
| -gen | something that produced or produces | pathogen: a microorganism or agent capable of producing disease |