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A GUIDE TO MEDICAL TERMINOLOGY

STUDY GUIDE

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This study guide is targeted for students at the second (Master) training level majoring in the specialties that fall within the 22 “Healthcare” branch of knowledge. It focuses on splitting medical terms into their component parts, spelling and pronouncing medical terms, as well as learning the meanings of medical terms of Greek and Latin origins. Its main objectives are to: lay the students’ foundation in medical terminology and language; master students’ understanding and exploiting of essential anatomical and clinical terminology; and prepare students for taking the English Language Proficiency Test as a component of the first stage of the Unified State Qualification Examination. The study guide is organized into three units and six appendices that altogether present basic components of medical terms, elucidate language rules according to which medical terms are constructed and function, contain review exercises and flashcards that can be used to check and consequently improve learners’ knowledge and mastery of anatomical and clinical medical terminology. The study guide contains materials for classroom work as well as for self-study and self-control.

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CONTENTS

PREFACE	5
LIST OF ABBREVIATIONS	8
UNIT 1. INTRODUCTION TO MEDICAL TERMINOLOGY	9
1.1. WHAT IS MEDICAL TERMINOLOGY?	9
1.2. ETYMOLOGY: THE ORIGINS OF MEDICAL TERMINOLOGY	9
1.3. HOW IS MEDICAL TERMINOLOGY CONSTRUCTED?	10
1.4. SPELLING OF MEDICAL TERMS	17
1.5. PRONUNCIATION OF MEDICAL TERMS	20
UNIT 1. REVIEW	24
UNIT 2. SUFFIXES IN MEDICAL TERMINOLOGY	30
2.1. COMMON SURGICAL SUFFIXES	31
2.2. DIAGNOSTIC, PATHOLOGICAL, AND RELATED SUFFIXES	35
2.3. GRAMMATICAL SUFFIXES	42
2.4. PLURAL SUFFIXES	47
UNIT 2. REVIEW	50
UNIT 3. PREFIXES IN MEDICAL TERMINOLOGY	56
3.1. PREFIXES OF POSITION	56
3.2. PREFIXES OF NUMBER AND MEASUREMENT	60
3.3. PREFIXES OF DIRECTION.....	63
3.4. NEGATIVE PREFIXES	66
3.5. OTHER COMMON PREFIXES	69
UNIT 3. REVIEW	74
APPENDICES	79
APPENDIX A. ALPHABETICAL LIST OF COMMON MEDICAL EPONYMS	80

APPENDIX B. ALPHABETICAL LIST OF COMMON MEDICAL WORD	
ROOTS & COMBINING FORMS	85
APPENDIX C. ALPHABETICAL LIST OF COMMON MEDICAL SUFFIXES	101
APPENDIX D. ALPHABETICAL LIST OF COMMON MEDICAL PREFIXES	107
APPENDIX E. ALPHABETICAL LIST OF COMMON GREEK AND LATIN	
MEDICAL NOUNS IN SINGULAR AND PLURAL FORMS	112
APPENDIX F. FLASHCARDS	123
REFERENCES	165

PREFACE

The constant intensification of globalization processes in the modern world naturally leads to the spread of the English language, not only as a lingua franca but also as an essential tool for the exchange and integration of professional knowledge. Accordingly, the successful performance of professional tasks by students mastering in medicine and related fields, as well as medical practitioners and medical scientists, depends not solely on their professional knowledge, abilities, and skills but also on the level of their foreign language, particularly English, competency. Medical terminology serves as the universal language and the backbone of healthcare communication, promoting accuracy, safety, and efficiency while facilitating global collaboration and advancing medical science.

Hence, this study aid has been generated in response to an increasing demand for career-specific language skills training in healthcare. The book is directed at the level of English for Specific Purposes and assumes the learner will have at least an intermediate level of English language competency and skills. “A Guide to Medical Terminology” has primarily been designed for those students in health studies programs or health professionals who are of non-English-speaking backgrounds. It is chiefly intended for international students of medical specialties at higher educational institutions who use English as a medium of instruction.

In accordance with Resolution of the Cabinet of Ministers of Ukraine No. 334, “On approval of the procedure for the Unified State Qualification Examination for applicants for a master’s degree in healthcare”, dated March 28, 2018, the exam in English is a component of the first stage of the Unified State Qualification Examination. The objective of the English Language Proficiency Test (as a component of the Unified State Qualification Exam for the students enrolled in Master’s degree programs and majoring in the specialties that fall within the 22 “Healthcare” branch of knowledge) is to assess students’ occupational proficiency in English for Specific Purposes. This study guide is an excellent companion resource for student success in medical English vocabulary in general and the English Language Proficiency Test in particular, since it summarizes the author’s practical experience of teaching essential medical terminology and preparing students for taking the English Language Proficiency Test.

The study guide has been compiled to do the following:

- build a foundation in medical terminology and language that is readily transferable to a variety of health situations and employment settings;
- provide opportunities for the study of new medical vocabulary, word building, and word-recognition skills;
- master understanding and exploiting essential anatomical and clinical terminology;
- prepare for taking the English Language Proficiency Test as a component of the first stage of the Unified State Qualification Examination.

At first glance, medical terminology can seem like a foreign language. But often, the key to understanding medical terms is concentrating on their components (prefixes, word roots, and suffixes). Knowing the meaning of a small number of components can help with the interpretation of a large number of medical terms. Therefore, this study guide focuses on building vocabulary for the purpose of communication in healthcare and health science settings by means of mastering components of medical terms and learning language rules according to which these word parts are put together in a term. Special attention is paid to the pronunciation and spelling of medical terminology. Spelling and pronouncing medical terms correctly is not only a matter of accuracy but also of credibility and respect. Moreover, misspellings and mispronunciations in a medical setting can result in life-threatening situations. A misspelled or misunderstood medical term for a medical procedure, drug name, or drug dosage can have very serious consequences.

Components that promote learning include the following:

- informative tables;
- clinical and medical examples that enhance learning;
- pronunciation and stressing hints for medical terms;

- a variety of exercises that require the immediate use of new terms and knowledge;
- exercises that require critical thinking about medical terms and their contexts;
- exercises that require reflection on what has been presented to draw meaning from it;
- unit review exercises;
- extensive supplementary materials (appendices).

The study guide is organized into three units and six appendices, which contain the following components: an alphabetical list of common medical eponyms; alphabetical lists of common medical word roots and combining forms, as well as suffixes and prefixes; an alphabetical list of common Greek and Latin medical nouns in singular and plural forms; and removable flashcards.

Each unit consists of theoretical and practical parts. The theoretical parts introduce the learner to the topics presented in the units; include language rules according to which medical terms are constructed and function; list common medical suffixes, prefixes, and word roots along with their meanings and term analyses. Practical components present practice activities that help you to master spelling, pronunciation, and usage of anatomical and clinical medical terminology, as well as include review sections at the ends of subsequent units, which are aimed at repetition and consolidation of covered material in context.

Unit 1, "Introduction to Medical Terminology", provides an explanation of the etymology of medical terminology, describes the main components of medical terms, and outlines language rules for building medical terms. It opens with a general introduction to medical terminology and is followed by an overview of the four component parts that medical terms are typically composed of. Careful attention is given to the rules of spelling and pronunciation of medical terms. This unit creates the foundation that enables you to master the rest of the study guide.

Unit 2, "Suffixes in Medical Terminology", considers common medical suffixes and provides a brief revision of the ways they can be combined with other essential components of medical terms. This unit also presents the classification of medical suffixes in the form of tables according to their purpose or function.

Unit 3, "Prefixes in Medical Terminology", deals with the meanings, usage, and classification of medical prefixes, as well as the rules for combining them with other word parts.

Appendix A contains an alphabetical list of common medical eponyms as well as their descriptions and brief information about their origins. In the fields of medicine and health services, many medications, diseases, medical devices, surgical procedures, treatments, etc. are labeled with eponyms, which make no sense to you unless you are familiar with them. Nevertheless, eponyms are widely used in oral and written medical communication, prompting brevity and laconism and having powerful associative and imaginative potential that contributes to better memorization. Thus, in order to gain a more profound understanding of medical texts and oral messages, it is absolutely necessary to know the meanings of the most widely used eponyms.

Appendices B, C, and D are convenient alphabetic references for medical word parts (word roots, combining forms, suffixes, and prefixes). When you do not recognize a word part or doubt which vowel to use with it, you can look it up here.

Appendix E is an extensive alphabetical list of commonly used Greek and Latin medical nouns in singular and plural forms, accompanied by their concise definitions. Most medical nouns are irregular plural nouns that do not follow the standard rule of adding an "-s" but make their plurals according to the rules of Greek and Latin with English pronunciation, and some even present specific exceptions that do not follow any of the above-mentioned rules of pluralization. However, accurate usage of plurals is of great significance in medical communication. Thus, when you cannot recall the plural form of a medical noun, you can look it up in this appendix.

Appendix F can be applied to improve your knowledge and test your mastery of anatomical and clinical medical terminology by using the flashcards containing common medical suffixes, prefixes, and their meanings. Flashcards are an effective study aid, even when you only have a small amount of time.

Given the current methodological trends in ESP teaching as well as the exclusive objectives of Medical English teaching, all materials contained in this study aid are aimed at:

- revealing subject-specific language use;
- developing students' target performance competencies;
- providing students with underlying competency (i.e., general conceptual healthcare content alongside language);
- developing the so-called students' strategic competence (i.e., the means that enable language knowledge and content knowledge to be used in communication);
- fostering students' critical awareness.

This study guide can also be used by medical students of specialized secondary and higher educational institutions who use Ukrainian as a medium of instruction in the process of studying English medical terminology and preparing for the first stage of the Unified State Qualification Examination, as well as by teachers who teach English for Medical Purposes.

The study guide is intended for classroom work as well as for self-study and self-control.

LIST OF ABBREVIATIONS

ESP – English for Specific Purposes

AmE – American English

BrE – British English

a.k.a. – also known as

c. – abbreviation of the Latin word “*circa*” which means “*around*”, or “*approximately*”

UNIT 1. INTRODUCTION TO MEDICAL TERMINOLOGY

1.1. WHAT IS MEDICAL TERMINOLOGY?

Medical terminology includes all of the specialized vocabulary that medical professionals use to identify human anatomy (structures) and physiology (functions), as well as words that indicate location, direction, planes of the body, medical status, and instructions for administering medication. Its main task is to build effective and accurate communication among health care professionals.

Medical terminology also includes *eponyms*, which will be important to learn in the health-care field. An eponym is a word that is generated from the name of a person. A medical eponym is created by naming a disease, a test, or another facet of medicine for the person who discovered it, suffered from it, or in some other way contributed to it by way of a legacy. For instance, *Alzheimer's disease* was named for Alois Alzheimer, a German psychiatrist and neurologist who identified this degenerative, terminal disease of the brain around the turn of the 20th century. This disease is part of the family of dementias, and it has retained Dr. Alzheimer's name to honor his contributions to science and medicine in its regard. A list of common medical eponyms is given in Appendix A.



1.2. ETYMOLOGY: THE ORIGINS OF MEDICAL TERMINOLOGY

The history of a word is called its etymology. Medical terms generally derive from the early Greek and Latin languages. Many current medical word elements originated as early as the 1st century B.C., when Hippocrates practiced medicine. They include word parts that are well recognized in health care in large parts of the world, particularly in countries or among people whose own languages had similar origins or were at one time (many hundreds of years ago) part of the Greek or Roman Empires. For example, these types of medical terms appear in the English, French, Spanish, Portuguese, and German languages. The countries in which these languages are spoken, in turn, influenced the languages of other nations when they, too, went through an age of empire; that's why you may very well hear a medical term that you recognize spoken in the Bangla language of Bangladesh or in Swahili in certain parts of Africa.

Take a look at Table 1.2.1 to see how influential the early Greek and Latin languages have been on the languages of the world.

Table 1.2.1	Common Word Parts Derived from Greek and Latin		
	Word Part	Origin	Examples
	hyper- A prefix meaning "over, above, or excessive"	From the Greek word " <i>hyper</i> "	hyperactive (English) hyperactive (French) hiperaktif (Turkish) hyperactief (Dutch)
	hydro- A prefix meaning "water"	From the Greek word " <i>hydor</i> "	hydraulic (English) hydraulisk (Danish) hidraulico (Spanish) hidrolik (Turkish)

	-ology A suffix meaning “study”	From the Greek suffix “ -ology ”	biology (English) biológiában (Hungarian) biologia (Italian) biolog‘ija (Latvian)
	contra- A prefix meaning “opposite or against”	From the Latin prefix “ contra- ”	contraindicated (English) contraindicat (Catalan) kontraindikováno (Czech) kontraindikasi (Indonesian)
	semi- A prefix meaning “half”	From the Latin prefix “ semi- ”	semicircle (English) semicircle (Icelandic) semicerchio (Italian) semicírculo (Portuguese)



1.3. HOW IS MEDICAL TERMINOLOGY CONSTRUCTED?

The medical vocabulary is vast, and learning it may seem like learning the entire vocabulary of a foreign language. Moreover, like the jargon that arises in all changing fields, it is always expanding. Think of the terms that have been added to our vocabulary with the development of computers, such as “software”, “megabyte”, “crowdfunding”, “e-mail”, “gadget”, “phishing”, “spammer”, etc. The task seems overwhelming, but there are methods that can aid in learning and remembering words and can even help in making informed guesses regarding the meanings of unfamiliar words.

Medical terminology is constructed systematically. Most medical terms can be divided into four component parts – **word roots**, **combining vowels**, **prefixes** and **suffixes** – that maintain the same meaning whenever they appear. Prefixes are commonly found at the beginning of words; roots – generally in the middle of words; and suffixes are at the end of words. Combining vowels are often needed to connect a medical root with a prefix or a suffix to form a medical term. Although not all medical terms are the result of combining Latin or Greek word parts, many are. Learning these word parts and acquiring the ability to combine them in meaningful ways will help you recognize and understand new combinations when you encounter them in the workplace.

To better understand the formation of medical terms, identifying marks will be used to separate their different elements:

- **slash (/)** – to separate word elements (e.g., *gastr/o*);
- **hyphen (-)** – in front of a suffix; (e.g., *-tomy*);
- **hyphen (-)** – after a prefix; (e.g., *poly-*).

Remember that the correct spelling of medical terminology is a must. If a term is misspelled, the meaning may change. For instance, “*ileum*” and “*ilium*” are pronounced the same way but have different meanings:

- *ileum* – the last division of the small intestine extending between the jejunum and large intestine;
- *ilium* – the broad, dorsal, upper, and largest of the three principal bones composing either half of the pelvis.

Word Roots*

A word root is the foundation of a medical term and contains its primary meaning. Most word roots are derived from the Greek or Latin languages. Thus, two different roots may have the same meaning. For example, the Greek word *dermatos* and the Latin word *cutane* both refer to *the skin*. As a general rule, Greek roots are used to build terms that describe a disease, condition, treatment,

or diagnosis. Latin roots are used to build terms that describe anatomical structures. Consequently, the Greek root *dermat* is used primarily in terms that describe a disease, condition, treatment, or diagnosis of the skin; the Latin root *cutane* is used primarily to describe an anatomical structure (see Table 1.3.1).

**Find an extended alphabetical list of common medical word roots in Appendix B.*

Table 1.3.1	Examples of Word Roots			
	This table lists examples of some of the most common word roots.			
	English Term	Greek or Latin Term*	Word Root	Word Analysis
	skin	dermatos (Gr)	dermat	dermat /itis (derma'titis): inflammation of the skin. A term that describes a skin disease.
		cutis (L)	cutane	cutane /ous (cu'taneous): pertaining to the skin. A term that describes an anatomical structure.
	kidney	nephros (Gr)	nephr	nephr /oma (ne'phroma): tumor of the kidney. A term that describes a kidney disease.
		renes (L)	ren	ren /al ('renal): pertaining to the kidney. A term that describes an anatomical structure.
	mouth	stomatos (Gr)	stomat	stomat /itis (stoma'titis): inflammation of the mouth. A term that describes any inflammatory condition of the mouth.
		oris (L)	or	or /al ('oral): pertaining to the mouth. A term that describes an anatomical structure.

**It is not important to know the origin of a medical term. This information is provided here to help avoid confusion and illustrate that there may be two different word roots for a single term.*

Combining Vowels & Combining Forms*

A combining form is created when a word root is combined with a vowel. The vowel, known as a combining vowel, is usually an "o", but sometimes it is an "e" or an "i". The combining vowel has no meaning of its own but enables two-word elements to be connected. Like the word root, the combining form is the basic foundation to which other word elements are added to build a complete medical term. In this textbook, a combining form will be listed as word root/vowel (such as *gastr/o*), as illustrated in Table 1.3.2.

**Find an extended alphabetical list of common combining forms in Appendix B.*

Table 1.3.2	Examples of Combining Forms						
	<i>This table illustrates how word roots and vowels create combining forms.</i>						
	Word Root	+	Vowel	=	Combining Form	Meaning	Medical Term
	gastr/	+	o	=	gastr/o	stomach	gastr/o/megaly
	chol/	+	e	=	chol/e	bile	chol/e/lith
	pelv/	+	i	=	pelv/i	pelvis	pelv/i/metry

Suffixes*

A suffix is a word element placed at the end of a word that changes the meaning of the word. In the terms *tonsillitis* and *tonsillectomy*, the suffixes are *-itis* (inflammation) and *-ectomy* (excision, removal). Changing the suffix changes the meaning of the word. In medical terminology, a suffix usually describes a pathology (disease or abnormality), symptom, surgical or diagnostic procedure, or part of speech. Many suffixes are derived from Greek or Latin words (see Table 1.3.3).

**Find an extended alphabetical list of common medical suffixes in Appendix C.*

Table 1.3.3	Examples of Suffixes					
	<i>This table lists examples of some pathological suffixes.</i>					
	Combining Form	+	Suffix	=	Medical Term	Meaning
	gastr/o (stomach)	+	-itis (inflammation)	=	gastritis (gas'tritis)	inflammation of the stomach
		+	-megaly (enlargement)	=	gastromegaly (gastro'megaly)	enlargement of the stomach
		+	-oma (tumor)	=	gastroma (gas'troma)	tumor of the stomach
	hepat/o (liver)	+	-itis (inflammation)	=	hepatitis (hepa'titis)	inflammation of the liver
		+	-megaly (enlargement)	=	hepatomegaly (hepato'megaly)	enlargement of the liver
		+	-oma (tumor)	=	hepatoma (hepa'toma)	tumor of the liver

Suffixes beginning with “rh”

When a suffix beginning with “rh” is added to a root, the “r” is doubled:

- **hem/o** (blood) + **-rhage** (bursting forth) = **hemorrhage** (a bursting forth of blood);
- **men/o** (menses) + **-rhea** (flow, discharge) = **menorrhea** (menstrual flow).

Prefixes*

A prefix is a word element attached to the beginning of a word or word root. However, not all medical terms have a prefix. Adding or changing a prefix changes the meaning of the word. Prefixes can be grouped according to their descriptive function. The prefix usually indicates a number, time, position, direction, or negation. Many of the same prefixes used in medical terminology are also used in general English (see Table 1.3.4).

**Find an extended alphabetical list of common medical prefixes in Appendix D.*

Table 1.3.4	Examples of Prefixes							
	This table lists examples of prefixes.							
	Prefix	+	Word Root	+	Suffix	=	Medical Term	Meaning
	an- (without, not)	+	esthes (feeling)	+	-ia (condition)	=	anesthesia (anes'thesia)	condition of not feeling
	hyper- (excessive, above normal)	+	therm (heat)	+	-ia (condition)	=	hyperthermia (hyper'thermia)	condition of excessive heat
	poly- (many, much)	+	ur (urine)	+	-ia (condition)	=	polyuria (poly'uria)	condition of much urine

In summary, the important elements of medical terms are the following:

1. **Root:** the foundation of the term.
2. **Combining vowel:** a vowel (usually "o") that links the root to the suffix or the root to another root*.
3. **Suffix:** word ending.
4. **Prefix:** word beginning.

** Combining form: combination of the root and the combining vowel.*

Language Rules for Building Medical Terms

Defining and building medical terms are crucial skills in mastering medical terminology. Following the basic guidelines for each will help you develop these skills.

1. When merging two combining forms, you keep the combining form vowel.
2. When combining a combining form with a suffix that begins with a consonant, you keep the combining vowel.

Example

Gastr/o/enter/o/logy – the study of the stomach and the intestines.

- Following **rule 1**, when we join the combining form *gastr/o* (meaning *stomach*) with the combining form *enter/o* (meaning *intestines*) we keep the combining vowel *o*.
- Following **rule 2**, when we join the combining form *enter/o* (meaning *intestines*) with the suffix *-logy* (that starts with a consonant and means *the study of*) we keep the combining vowel *o*.

3. When combining a combining form with a suffix that begins with a vowel, you drop the combining form vowel.
4. A prefix goes at the beginning of the word. When a prefix ends with a vowel, no combining vowel is used.

Example

Intra/ven/ous – pertaining to within the vein.

- Following **rule 3**, notice that when combining the combining form *ven/o* (meaning *vein*) with the suffix *-ous* (that starts with a vowel and means *pertaining to*) we drop the combining vowel *o*.
- Following **rule 4**, the prefix *intra-* (meaning *within*) ending with the vowel *a* is at the beginning of the medical term, so no combining vowel is used.

5. When defining a medical term, start with the suffix first and then work left to right, stating the word parts. You may need to add filler words. As long as the filler word does not change the meaning of the word, you may use it for the purpose of building a medical vocabulary. Once you start to apply the word in the context of a sentence, it will be easier to decide which filler word(s) to choose.

Example

Intra/ven/ous – pertaining to within the vein or pertaining to within a vein.

- Following **rule 5**, notice that we start with the suffix *-ous* (that means *pertaining to*) then we work left to right starting with the prefix *intra-* (meaning *within*) and the combining form *ven/o* (meaning *vein*).
- Notice that we have used two different definitions that mean the same thing.
- In these examples we do not have the context of a full sentence. For the purpose of building a medical terminology foundation either definition is accepted.

In summary, remember three general rules:

1. Read the meaning of medical terms from the suffix back to the beginning of the term and across.
2. Drop the combining vowel (usually “o”) before a suffix beginning with a vowel: ***gastritis***, not “gastroitis”.
3. Keep the combining vowel between two roots: ***gastroenterology***, not “gastreterology”.

Exercises (Defining Components of Medical Terms)

1. Fill in the following blanks to complete the sentences correctly.

- 1) The four elements used to form words are
- 2) When a word root is combined with a vowel, a(n) is created.
- 3) A word part that comes before a root is a(n)
- 4) A word element placed at the end of a word that changes the meaning of the word is a(n)
- 5) A root is the main part or foundation of a word. In the terms “cephalalgia”, “cephalometry” and “cephalemia” the root is

2. Identify the following statements as true or false. If false, rewrite the statement correctly on the line provided under the statement.

- | | | |
|--|------|-------|
| 1) A combining vowel is usually an “e”. | True | False |
| _____ | | |
| 2) A word root links a suffix that begins with a consonant. | True | False |
| _____ | | |
| 3) A combining form links multiple roots to each other. | True | False |
| _____ | | |
| 4) A combining form links a suffix that begins with a consonant. | True | False |
| _____ | | |
| 5) When a suffix beginning with “rh” is added to a root, the “r” is never doubled. | True | False |
| _____ | | |
| 6) No combining vowel is used after a prefix. | True | False |
| _____ | | |
| 7) To define a medical term, define the prefix first. | True | False |
| _____ | | |

8) In the term “intracranial”, “intra” is the prefix.	True	False
9) The term “rhinoplasty” is made up of two word roots.	True	False
10) The term “anesthesia” contains no suffix.	True	False

3. Identify the combining vowel in the italicized medical term, and then write it in the blank space provided.

- 1) The patellar tendon attaches the anterior *quadriceps* muscles to the tibia.
- 2) David has *hemophilia*.
- 3) Mr. Carter has to see the *urologist*.
- 4) Intrahepatic *cholestasis* of pregnancy (ICP) is a pregnancy-specific disorder.
- 5) Mrs. Wilson has severe eczema and wants to see a *dermatologist*.
- 6) Clinical *pelvimetry* can only be useful to qualitatively identify the general architectural features of the pelvis.
- 7) The primary goal of *audiovisual* instruction is learning.
- 8) Of all cranial *meningiomas*, about 20% of them are in the sphenoid wing.
- 9) In *meningocele*, the spinal cord develops normally but the meninges protrude through a spinal opening.
- 10) A retrograde *pyelogram* is done to locate the stone in the kidney.

4. a) Underline the word roots in the following medical terms.

Medical Term	Meaning
1) nephritis	inflammation of the kidneys
2) arthrodesis	fixation of a joint
3) dermatitis	inflammation of the skin
4) dentist	specialist in teeth
5) gastrectomy	excision of the stomach
6) chondritis	inflammation of cartilage
7) hepatoma	tumor of the liver
8) muscular	pertaining to muscles
9) gastritis	condition of the stomach
10) osteoma	tumor of the bone

b) Do any of the above listed terms contain combining vowels? If yes, identify the terms and the combining vowels contained in them.

5. a) Define elements of the medical terms listed below. Use Appendices B, C, and D to help you. The first one is done for you.

Medical Term	Prefix	Word Root	Suffix	Combining Vowel(s)
1) thrombolysis	–	<i>thromb</i>	<i>-lysis</i>	<i>o</i>
2) myorrhaphy				
3) hypertrophy				
4) cholelith				
5) aphasia				
6) neuroma				
7) thoracotomy				
8) endoscopy				
9) bradycardia				
10) pelvimetry				
11) postnasal				
12) osteomalacia				
13) urinary				
14) hypothermia				
15) pyelogram				
16) polysplenia				

b) What rules were used for building these medical terms?



1.4. SPELLING OF MEDICAL TERMS

Spelling differences between British and American English

Differences between British and American English spelling are often encountered both in general English and English medical terminology. As a rule, British English (BrE) retains the spelling of words it has borrowed from other languages, especially Greek (*disk/disc*, *sulphur/sulfur*, *ampoule/ampule*), Latin, French (*vigour/vigor*), and Old English, whereas American English (AmE) spellings are based mainly on the pronunciation of the word. The main spelling differences that exist between British and American English are listed below.

➤ Nouns ending in “-our” in British English are spelt with an “-or” in American English.

BrE	AmE
tumour	tumor

➤ In American English, the letter “z” is used in nouns ending in “-ization” (*specialization*), and verbs ending in “-ize” (*specialize*). A common misconception is that in British English, only the letter “s” is used to spell these endings. In fact, both the “-ise” and “-ize” spellings are valid in British English (*specialisation/specialization*, *specialise/specialize*).

BrE	AmE
Verb: stigmatise / stigmatize	Verb: stigmatize
Noun: stigmatisation / stigmatization	Noun: stigmatization

➤ Verbs ending in “-yse” in British English are spelt with “-yze” in American English.

BrE	AmE
analyse	analyze

➤ Nouns ending in “-re” in British English are spelt with the suffix “-er” in American English.

BrE	AmE
fibre	fiber

➤ American English tends to omit the silent letter “-e” at the end of nouns, especially those loaned from French. Often, in British English, the consonant before the silent “-e” is doubled.

BrE	AmE
programme	program
glycerine	glycerin

➤ Some nouns that end with “ogue” in British English end with either “g” or “ogue” in American English.

BrE	AmE
analogue	analog / analogue

➤ Medical terms containing diphthongs that derive from Greek and were transliterated to Latin and then English can have different spellings in British English and American English. These spelling differences are illustrated in the table given below.

Greek	Latin	BrE	AmE
ου	u	u (urine)	u (urine)
ευ	eu	eu (neuron)	eu (neuron)
οι	oe	oe (oesophagus)	e (esophagus)
αι	ae	ae (haematemesi)	e (hematemesis)
ει	ei	ei (leiomyoma) ei (cheiloplasty) i (angiogenesis)	ei (leiomyoma) i (chiloplasty) i (angiogenesis)

Exercises (Defining BrE & AmE Ways of Spelling Medical Terms)

1. Check the appropriate box to signify whether the spelling of the following terms is British, American or both.

Term	BrE	AmE	Both
1) thyroxine			
2) center			
3) labor			
4) dialogue			
5) colour			
6) paralyze			
7) hospitalize			
8) metre			
9) vigour			
10) organise			
11) crystallisation			
12) gram			
13) catalog			
14) specialize			
15) flavor			
16) breathalyse			

2. Complete the table with either the British English spelling or the American English spelling.

BrE	AmE
1) diarrhoea	
2)	feces
3) tumour	
4) litre	
5)	edema
6)	gonorrhea
7) caesarean	
8)	anemia
9) foetus	
10)	ton

11)	orthopedics
12) anaesthetic	
13)	estrogen
14) leukaemia	



1.5. PRONUNCIATION OF MEDICAL TERMS

Although the pronunciations of medical terms usually follow the same rules that govern the pronunciations of common English words, some medical terms may be difficult to pronounce when first encountered. Study the basic rules of pronunciation that apply to medical terms, especially those that have Greek origins. Frequently, there is a difference in pronunciation between British and American English.

Pronunciation of Consonants

Table 1.5.1. Pronunciation of consonants

Consonant	Pronunciation	Example
c (before a, o, u)	/k/	c ardiac, c onception, c ulture
c (before e, i, y, ae)	/s/	c ervix, c irculation, c ytology, ca ecum
g (before a, o, u)	/g/	g angrene, g onorrhea, g um
g (before e, i, y)	/dʒ/	g ene, g ingivitis, g yrus
cc (before a, o, u)	/k/	buccal , tobacco , coccus
cc (before e, i, y)	/ks/	a ccessory, vaccine , coccyx

Table 1.5.2. Letter combinations indicating Greek letters

English	Greek	Pronunciation	Example
ch	χ	/k/	ch romosome
ph	φ	/f/	ph arynx
rh, rrh	ρ	/r/	rh inoplasty, hemorrhage
th	θ	/θ/	th erapy
x	ξ (first letter of a term)	/z/	x iphoid

Table 1.5.3. Letter combinations in which the first letter becomes silent

English	Pronunciation	Example
pn	/n/	p neumonia
ps	/s/	p soriasis
pt	/t/	p tyosis
gn	/n/	g nathion
mn	/n/	m nemonics

Table 1.5.4. Letter combinations found at the end of a word with one letter silent

Letter combination	Pronunciation	Example
gn	/n/	benign
gm	/m/	diaphragm
mn	/m/	column

Pronunciation of Vowels

Table 1.5.5. Pronunciation of Greek vowel combinations

Diphthong	Transliteration	Pronunciation	Example
αι	ae/e	/i:/	haematology (BrE) hematology (AmE)
αι	ae	/e/	aesthetics
αε	ae	/eə/	aerobics
οι	oe	/ɪ/	oedema
οι	oe	/i:/	oestrogen (BrE)
οι	e	/e/	estrogen (AmE)
ευ	eu	/ju:/	euphoria
ευ	eu	/jʊə/	neuron
ει	i	/i:/	angioplasty

Exercises (Pronunciation of Medical Terms)

1. Identify the pronunciation guidelines as true or false. If false, rewrite the guideline correctly on the line provided below.

1) The combination “ch” is often pronounced like “k” (e.g., chemistry, tachycardic). True False

2) When “pn” is at the beginning of a medical term, it is pronounced only with the sound of “p” (e.g., pneumonia, pneumotoxin). True False

3) The diphthong “ae” is always pronounced like “i” (e.g., aesthetics, haemoglobin). True False

4) If “x” is the first letter of a term, it is pronounced like “z” (e.g., xanthiuria, xeroderma). True False

5) When “g” stands before “a” and “u”, it is pronounced like “g”; but when it stands before “o”, it is pronounced like “dʒ” (e.g., gangrenous, guts, gonocyte). True False

6) The combination “cc” is pronounced like “ks” in any position (e.g., vaccine, buccal). True False

7) The Greek diphthong “oi” can be spelled like “oe” or “e”, but the pronunciation is the same in both cases (e.g., estrogenic, oestrogenic). True False

8) In letter combinations beginning with “p” (“pn”, “ps”, “pt”), the first letter is always silent (e.g., pneumatic, pseudographia, ptialoceles). True False

9) The combination “gn” is pronounced like “n” both at the beginning and at the end of medical terms (e.g., gnosis, benign). True False

10) In the diphthongs “ae” and “oe”, only the first vowel is pronounced (e.g., aesculin, oesophagus). True False

2. Practice your pronunciation of the medical terms given below. Provide pronunciation rule(s) that you applied for pronouncing each of them correctly.

Term	Pronunciation Rule(s)
1) occipital	
2) phrenic	
3) gynaecology	
4) meningitis	
5) oxygen	
6) psychiatry	
7) acidosis	
8) bronchoscope	
9) xerophthalmia	
10) breath	
11) locus	
12) aetiology	
13) thyroid	
14) gonorrhoea	
15) gnathology	
16) cephalalgia	
17) coccus	
18) chemotherapy	
19) eucalyptus	
20) rhinitis	
21) diaphragm	
22) ptyalogenic	

UNIT 1. REVIEW

1. Look at the medical terms given below. Underline the terms which contain combining vowels and indicate combining vowels in each term.

thymectomy amblyopia femorotibial colitis
glycosuria embryology primigravida prenatal
meningioma adenoidectomy cephalic bursitis
physiology lobotomy lobectomy fibril
epiglottitis cholesterol vasodilation nyctalgalia
gynecomastia calcification gingivitis pleurisy
claviclectomy amenorrhea cranial homeostasis

2. a) Define elements of the medical terms listed below. (Be careful. You will see some compound terms made up of several word roots or suffixes that have been combined). Use Appendices B, C, and D to help you.

Medical Term	Prefix	Word Root	Suffix	Combining Vowel(s)
1) arthropneumography				
2) bacteriostasis				
3) biparental				
4) bronchomalacia				
5) cardiotherapy				
6) cervicolabial				
7) dacryocystocele				
8) diuretic				
9) dystonia				
10) electromyogram				
11) embryoid				
12) embryectomy				
13) embolomycotic				
14) endopyelotomy				
15) episcleral				
16) fibrocarcinoma				

17) fibrositis				
18) ganglioform				
19) gastrorrhea				
20) glossotrichia				
21) hemacyte				
22) hemihepatectomy				
23) humeroulnar				
24) hypoliposis				
25) ileocolitis				
26) infrainguinal				
27) karyogenesis				
28) keratoderma				
29) laryngocentesis				
30) leucinosi				
31) melanemia				
32) meningioma				
33) mononeuropathy				
34) myeloscope				
35) neurodynia				
36) oligotrophia				
37) ophtalmoplasty				
38) pancreatoenterostomy				
39) pericardiorrhaphy				
40) phlebometritis				
41) rectovaginal				
42) splenosis				
43) stomatologist				
44) supraventricular				
45) tracheogenic				
46) transseptal				
47) uniglandular				
48) uropathogen				
49) ventriculoencephalitis				
50) xanthopsia				

b) What rules were used for building these medical terms?

c) Use your medical background knowledge and available sources to explain meanings of the terms.

3. Complete the table with either the British English spelling or the American English spelling.

BrE	AmE
1)	etiology
2) caesarean	
3)	dyspnea
4)	estrogen
5) behaviour	
6) paralyse	
7)	centimeter
8)	labor
9) fibre	
10)	celiac
11)	tumor
12) orthopaedic	
13)	glycerin
14) haemoglobin	
15)	defecation
16)	maneuver
17) leucocyte	
18)	catalyze
19) programme	
20)	center
21) diarrhoea	

4. Check the appropriate box to signify whether the spelling of the following terms is British, American or both.

Term	BrE	AmE	Both
1) apnoea			
2) fetus			
3) discolor			

4) leiodystonia			
5) center			
6) stigmatization			
7) psychoanalyse			
8) hemostasis			
9) euphoria			
10) analogue			

5. Practice your pronunciation of the medical terms given below. Provide pronunciation rule(s) that you applied for pronouncing each of them correctly.

Term	Pronunciation Rule(s)
1) amenorrhea	
2) ptarmus	
3) coccyx	
4) paediatric	
5) gnathoplasty	
6) genitalia	
7) thermalgesia	
8) anaesthetic	
9) rhexis	
10) phlegm	
11) oesophagus	
12) xerodermatic	
13) gonorrhea	
14) pseudoarthrosis	
15) multicolumn	
16) defaecation	
17) choriangioma	
18) phalangitis	
19) leukemia	
20) calciuria	
21) eukaryotic	
22) etiology	
23) mnemonic	

24) rheumatologist	
25) pneumonocyte	
26) chiropractor	

CASE STUDY: MULTIPLE HEALTH PROBLEMS SECONDARY TO INJURY

M.R., a 31-year-old woman, was treated for injuries sustained in a train derailment accident. During the course of her treatment, she was seen by several specialists. For pain in her knee and hip joints, she was referred to an orthopedist. For migraine headaches and blurry vision, she consulted a neurologist. For pain on urination and occasional bloody urine, she saw a urologist. Later, for a persistent dry cough and problems resulting from a fractured nose, she was referred to an otorhinolaryngologist. During her initial course of treatment, she had a CT scan of her abdomen and brain and an MRI of her hip and knee. Both imaging studies required her to lie motionless on her back for 45 minutes.

Several months after the accident, M.R. was still experiencing some discomfort, and she decided to investigate alternative therapies. She made an appointment with a naturist practitioner who specialized in homeopathy and herbal medicine. Before her appointment, she browsed in the Nutra-Medica Shop, which carried nutritional supplements, vitamin and mineral products, homeopathic remedies, and herbal formulas. She planned to ask the therapist about some of the products that she saw there, which included remedies with the trade names Pneumogen, Arthogesia-Plus, Renovite, Nephrostat, and Hematone.

CASE STUDY QUESTIONS

1. Multiple choice: Select the best answer and write the letter of your choice to the left of each number.

_____ 1) The “-logist” in the word “neurologist” is a:

- a. prefix
- b. root
- c. suffix
- d. combining form
- e. conjunction

_____ 2) “Endo-” in the term “endoscopic” is a:

- a. root
- b. suffix
- c. combining form
- d. prefix
- e. derivation

_____ 3) MRI stands for magnetic resonance imaging. This term represents a(n):

- a. combining form
- b. acronym
- c. prefix
- d. suffix
- e. abbreviation

_____ 4) M.R. needed plastic surgery on her nose to repair the postfracture deformity. This procedure is called a(n):

- a. septoscope
- b. rhinoplasty
- c. neurectomy
- d. cardioplasty
- e. rhinitis

_____ 5) Several of the radiological imaging studies required M.R. to lie on her back for 45 minutes. This position is referred to as:

- a. supine
- b. prone
- c. lateral recumbent
- d. lithotomy
- e. Trendelenburg

_____ 6) The products Renovite and Nephrostat are named for their action on the:

- a. lung
- b. nerves
- c. liver
- d. heart
- e. kidney

_____ 7) The “pn” in Pneumogen is pronounced as:

- a. /p/
- b. /pa/
- c. /n/
- d. /pn/

UNIT 2. SUFFIXES IN MEDICAL TERMINOLOGY

In medical terms, a suffix is added to the end of a medical root or a combining form to modify its meaning and change its part of speech. For example, the combining form *cardi/o* means *heart*. The suffix *-megaly* means *enlargement*, and *-itis* means *inflammation*. *Cardi/o/megaly* is an *enlargement of the heart*; *card/itis* is an *inflammation of the heart*. Whenever you change the suffix, you change the meaning of the term (see Table 2.1).

Suffixes can begin with consonants or vowels. Follow these rules when adding a suffix to a medical root or a combining form:

- when the suffix begins with a consonant and the root has a combining vowel, simply add the suffix (e.g., *splen/o* + *-tomy* = *splenotomy*);
- when the suffix begins with a vowel and the root has a combining vowel, drop the combining vowel of the root before adding the suffix (e.g., *splen/o* + *-ectomy* = *splenectomy*).

Words that contain more than one word root are known as *compound words*. Multiple word roots within a compound word are always changed to combining forms so that the roots are joined together with a combining vowel, regardless of whether the second word root begins with a vowel or a consonant. Notice that a combining vowel is used in Table 2.2 between *gastr* and *enter*, even though the second word root, *enter*, begins with a vowel. Keep in mind the rule for linking multiple roots is slightly different from the rules for linking word roots to suffixes. Remember that suffixes that begin with a vowel are linked with a word root; suffixes that begin with a consonant are linked with a combining form.

The tables contained in this unit represent some common medical suffixes that are organized by how they are most often used. These are just a few of the many suffixes that you will be using in your healthcare career. The tables demonstrate how suffixes are combined with medical roots or their combining forms to create different medical terms from the same roots.

Table 2.1	Word Roots and Combining Forms with Suffixes			
This table provides examples of word roots used to link a suffix that begins with a vowel. It also lists combining forms (root + o) used to link a suffix that begins with a consonant.				
	Element + Suffix = Medical Term			Meaning
	Word Roots			
	gastr (stomach)	-itis (inflammation)	gas´tritis	inflammation of the stomach
	hemat (blood)	-emesis (vomiting)	hemat´emesis	vomiting of blood
	arthr (joint)	-itis (inflammation)	ar´thritis	inflammation of a joint
	Combining Forms			
	gastr/o (stomach)	-dynia (pain)	gastro´dynia	pain in the stomach
	hemat/o (blood)	-logy (study of)	hema´tology	study of blood
	arthr/o (joint)	-centesis (surgical puncture)	arthrocen´tesis	surgical puncture of a joint

Table 2.2	Compound Words with Suffixes <i>This table shows examples of medical terms with more than one word root, and also suffixes linked together with word roots when the suffix begins with a vowel.</i>				
	Combining Form	+ Word Root	+ Suffix	= Medical Term	Meaning
	gastr/o (stomach)	enter (intestine)	-itis (inflammation)	gastroenter´itis	inflammation of stomach and intestine
	oste/o (bone)	arthr (joint)	-itis (inflammation)	osteoar´thritis	inflammation of bone and joint
	encephal/o (brain)	mening (meninges)	-itis (inflammation)	encephalomening´itis	inflammation of brain and meninges



TYPES OF SUFFIXES

Medical suffixes can be organized by their purpose or function. This type of organization is very helpful when you are trying to learn terms that are not common to your everyday word usage. By grouping the surgical, diagnostic, pathological, related, as well as grammatical and plural suffixes, they will be easier to remember.

2.1. COMMON SURGICAL SUFFIXES

Surgical suffixes describe a type of invasive procedure performed on a body part (see Table 2.1.1).

Table 2.1.1	Common Surgical Suffixes <i>This table lists commonly used surgical suffixes along with their meanings and word analyses.</i>		
	Suffix	Meaning	Term Analysis
	-centesis	surgical puncture	arthr/o/ centesis (arthrocen´tesis): puncture of a joint space with a needle and the withdrawal of fluid. <i>arthr/o: joint</i> Arthrocentesis may also be performed to obtain samples of synovial fluid for diagnostic purposes, instill medications, and remove fluid from joints to relieve pain.

-clasis	to break; surgical fracture	oste/o/ clasis (oste'oclasia): surgical fracture of a bone to correct a deformity. <i>oste/o: bone</i>
-desis	binding, fixation (of a bone or joint)	arthr/o/ desis (ar'throdesis): binding together of a joint. <i>arthr/o: joint</i> Arthrodesis is a surgical procedure to fuse bones across the joint.
-ectomy	excision, removal	append/ ectomy (appen'dectomy): excision of the appendix. <i>append: appendix</i>
-lysis	separation; destruction; loosening	thromb/o/ lysis (throm'bolysis): destruction of a blood clot. <i>thromb/o: blood clot</i> Drug therapy is usually used to dissolve a blood clot.
-pexy	fixation (of an organ)	mast/o/ pexy ('mastopexy): fixation of the breast(s). <i>mast/o: breast</i> Mastopexy, an elective surgery, is performed to affix sagging breasts in a more elevated position, commonly improving their shape.
-plasty	surgical repair	rhin/o/ plasty ('rhino/plasty): surgical repair of the nose. <i>rhin/o: nose</i> Plastic surgery to change the size or shape of the nose.
-rrhaphy	suture	my/o/ rrhaphy (my'orrhaphy): suture of a muscle. <i>my/o: muscle</i>
-stomy	forming an opening (mouth)	trache/o/ stomy (trache'ostomy): forming an opening into the trachea. <i>trache/o: trachea (windpipe)</i> A tracheostomy is an artificial opening performed to bypass an obstructed upper airway.
-tome	instrument to cut	oste/o/ tome ('osteotome): instrument to cut a bone. <i>oste/o: bone</i> An osteotome is a surgical chisel used to cut through a bone.
-tomy	incision	trache/o/ tomy (trache'otomy): incision (through the neck) into the trachea. <i>trache/o: trachea (windpipe)</i> Tracheotomy is performed to gain access to an airway below a blockage.
-tripsy	crushing	lith/o/ tripsy ('lithotripsy): crushing a stone. <i>lith/o: stone, calculus</i> Lithotripsy is a surgical procedure for eliminating a stone in the kidney, ureter, bladder, or gallbladder.

Exercises (Building Surgical Terms)

1. Use the meanings in the right column to complete the surgical terms in the left column. Think whether you need to use a combining vowel in each term. The first one is completed for you.

Incomplete Term	Meaning
1) episi/o/t o m y	incision of the perineum
2) col/o/	excision (of all or a part)* of the colon
3) arthr/o/	surgical puncture of a joint (to remove fluid)
4) splen/o/	excision of the spleen
5) col/o/	forming an opening (mouth) into the colon
6) oste/o/	instrument to cut a bone
7) tympan/o/	incision of the tympanic membrane
8) trache/o/	forming an opening (mouth) into the trachea
9) mast/o/	excision of a breast
10) lith/o/	incision to remove a stone or calculus
11) hemorrhoid/o/	excision of hemorrhoids
12) arthr/o/	fixation or binding of a joint
13) rhin/o/	surgical repair of the nose
14) ten/o/	surgical repair of tendons
15) my/o/	suture of a muscle
16) mast/o/	fixation of a (pendulous)* breast
17) cyst/o/	suture of the bladder
18) oste/o/	surgical fracture of a bone
19) lith/o/	crushing of a stone
20) enter/o/	separation of intestinal (adhesions)
21) neur/o/	crushing a nerve

**Information in parentheses is used to clarify the meaning of the word but not to build the medical term.*

2. Build a surgical term based on its meaning.

Meaning	Surgical Term
1) Forming an opening (mouth) into the colon:	
2) Excision of the colon:	
3) Instrument to cut a bone:	

4) Surgical puncture of a joint:	
5) Incision to remove a stone:	
6) Excision of a breast:	
7) Incision of the tympanic membrane:	
8) Forming an opening (mouth) into the trachea:	
9) Excision of the spleen:	
10) Surgical repair of the nose:	
11) Fixation of a joint:	
12) Suture of a muscle:	
13) Fixation of a (pendulous) breast:	
14) Suture of the bladder:	
15) Repair of tendons:	
16) Surgical fracture of a bone:	
17) Crushing stones:	
18) Separation of intestinal (adhesions):	
19) Crushing a nerve:	

3. Use the suffixes listed below to build surgical terms in the right column that reflect the meanings in the left column. Think whether you need to use a combining vowel in each term.

<i>-centesis</i>	<i>-ectomy</i>	<i>-plasty</i>	<i>-tome</i>
<i>-clasis</i>	<i>-lysis</i>	<i>-rrhaphy</i>	<i>-tomy</i>
<i>-desis</i>	<i>-pexy</i>	<i>-stomy</i>	<i>-tripsy</i>

Meaning	Incomplete Term
1) crushing of a stone:	lith/___/
2) puncture of a joint (to remove fluid)*:	arthr/___/
3) excision of the spleen:	splen/___/
4) forming an opening (mouth) into the colon:	col/___/
5) instrument to cut the skin:	derma/___/
6) forming an opening (mouth) into the trachea:	trache/___/
7) incision to remove a stone or calculus:	lith/___/
8) excision of a breast:	mast/___/
9) excision of hemorrhoids:	hemorrhoid/___/
10) incision of the trachea:	trache/___/
11) fixation of a breast:	mast/___/

12) excision of the colon:	col /__/
13) suture of the stomach (wall):	gastr/__/
14) fixation of the uterus:	hyster/__/
15) surgical repair of the nose:	rhin/__/
16) fixation or binding of a joint:	arthr/__/
17) to break or surgically fracture a bone:	oste/__/
18) loosening of nerve (tissue):	neur/__/
19) suture of a muscle:	my/__/
20) incision of the tympanic membrane:	tympan/__/

**Information in parentheses is used to clarify the meaning of the word but not to build the medical term.*



2.2. DIAGNOSTIC, PATHOLOGICAL, AND RELATED SUFFIXES

Diagnostic suffixes denote a procedure or test performed to identify the cause and nature of an illness. Pathological suffixes describe an abnormal condition or disease (see Table 2.2.1).

Table 2.2.1	Diagnostic, Pathological, and Related Suffixes		
	<i>This table lists commonly used diagnostic, pathological and related suffixes along with their meanings and term analyses.</i>		
	Suffix	Meaning	Term Analysis
	Diagnostic Suffixes		
	-gram	record, writing	electr/o/cardi/o/ gram (electro'cardiogram): record of the electrical activity of the heart. <i>electr/o: electricity</i> <i>cardi/o: heart</i>
	-graph	instrument for recording	cardi/o/ graph ('cardiograph): instrument for recording electrical activity of the heart. <i>cardi/o: heart</i>
	-graphy	process of recording	angi/o/ graphy (angi'ography): process of recording blood vessels. <i>angi/o: vessel (usually blood or lymph)</i> Angiography is the radiographic imaging of blood vessels after injection of a contrast medium.
	-meter	instrument for measuring	pelv/i/ meter * (pel'vimeter): instrument for measuring the pelvis. <i>pelv/i: pelvis</i>

-metry	act of measuring	pelv/i/ metry * (pel'vimetry): act or process of measuring the dimension of the pelvis. <i>pelv/i: pelvis</i>
-scope	instrument for examining	endo/ scope ('endoscope): instrument for examining within. <i>endo-: in, within</i> An endoscope is a flexible or rigid instrument consisting of a tube and optical system for observing the inside of a hollow organ or cavity.
-scopy	visual examination	endo/ scopy (en'doscopy): visual examination within. <i>endo-: in, within</i> Endoscopy is performed to visualize a body cavity or canal using a specialized lighted instrument called an endoscope.
Pathological and Related Suffixes		
-algia	pain	neur/ algia (neu'ralgia): pain of a nerve. <i>neur: nerve</i> The pain of neuralgia usually occurs along the path of a nerve.
-dynia		ot/o/ dynia (oto'dynia): pain in the ear; earache. <i>ot/o: ear</i>
-cele	hernia, swelling	hepat/o/ cele (he'patocele): hernia of the liver. <i>hepat/o: liver</i>
-ectasis	dilation, expansion	bronchi/ ectasis (bronchi'ectasis): dilation or expansion of one or more bronchi. <i>bronchi: bronchus (plural, bronchi)</i> Bronchiectasis is associated with various lung conditions and is commonly accompanied by chronic infection.
-edema	swelling	lymph/ edema (lymphe'dema): swelling and accumulation of tissue fluid. <i>lymph: lymph</i> Lymphedema may be caused by a blockage of the lymph vessels.
-emesis	vomiting	hyper/ emesis (hyper'emesis): excessive vomiting. <i>hyper-: excessive, above normal</i>
-emia	blood condition	an/ emia (a'nemia): blood condition caused by a decrease in red blood cells (erythrocytes). <i>an-: without, not</i>
-gen	forming, producing, origin	carcin/o/ gen (car'cinogen): forming, producing, or origin of cancer. <i>carcin/o: cancer</i> A carcinogen is a substance or agent, such as cigarettes, that causes the development or increases the incidence of cancer.
-genesis		carcin/o/ genesis (carcino'genesis): forming or producing cancer. <i>carcin/o: cancer</i>

			Carcinogenesis is the transformation of normal cells into cancer cells, commonly as a result of chemical, viral, or radioactive damage to genes.
-iasis	abnormal condition (produced by something specific)		chol/e/lith/ iasis * (choleli'thiasis): abnormal condition of gallstones. <i>chol/e: bile, gall</i> <i>lith: stone, calculus</i> Cholelithiasis is the presence or formation of gallstones in the gallbladder or common bile duct.
-itis	inflammation		gastr/ itis (gas'tritis): inflammation of the stomach. <i>gastr: stomach</i>
-lith	stone, calculus		chol/e/ lith * ('cholelith): gallstone. <i>chol/e: bile, gall</i>
-malacia	softening		chondr/o/ malacia (chondromal'acia): softening of the articular cartilage, usually involving the patella. <i>chondr/o: cartilage</i>
-megaly	enlargement		cardi/o/ megaly (cardio'megaly): enlargement of the heart. <i>cardi/o: heart</i>
-oma	tumor		neur/ oma (neu'roma): tumor composed of nerve tissue. <i>neur: nerve</i> A neuroma is a benign tumor composed chiefly of neurons and nerve fibers, usually arising from a nerve tissue. It may also be a swelling of a nerve that usually results from compression.
-osis	abnormal condition; increase (used primarily with blood cells)		cyan/ osis (cya'nosis): dark blue or purple discoloration of the skin and mucous membrane. <i>cyan: blue</i> Cyanosis indicates a deficiency of oxygen in the blood.
-pathy	disease		my/o/ pathy (my'opathy): disease of muscle. <i>my/o: muscle</i>
-penia	decrease, deficiency		erythr/o/ penia (erythro'penia): decrease in red blood cells. <i>erythr/o: red</i>
-phagia	eating, swallowing		dys/ phagia (dys'phagia): inability or difficulty in swallowing. <i>dys-: bad; painful; difficult</i>
-phasia	speech		a/ phasia (a'phasia): absence or impairment of speech. <i>a-: without, not</i>
-phobia	fear		hem/o/ phobia (hemo'phobia): fear of blood. <i>hem/o: blood</i>
-plasia	formation, growth		dys/ plasia (dys'plasia): abnormal formation or growth of cells, tissues, or organs. <i>dys-: bad; painful; difficult</i> Dysplasia is a general term for abnormal formation of an anatomic structure.

-plasm		neo/ plasm (ˈneoplasm): new formation or growth of tissue. <i>neo-: new</i> A neoplasm is an abnormal formation of new tissue, such as a tumor or growth.
-plegia	paralysis	hemi/ plegia (hemiˈplegia): paralysis of one side of the body. <i>hemi-: one half</i> Hemiplegia affects the right or left side of the body and is usually caused by a brain injury or stroke.
-ptosis	prolapse, downward displacement	blephar/o/ ptosis (blepharopˈtosis): drooping of the upper eyelid. <i>blephar/o: eyelid</i>
-rrhage	bursting forth (of)	hem/o/ rrhage (ˈhemorrhage): bursting forth (of) blood. <i>hem/o: blood</i> Hemorrhage refers to a loss of a large amount of blood within a short period, either externally or internally.
-rrhagia		men/o/ rrhagia (menoˈrrhagia): profuse discharge of blood during menstruation. <i>men/o: menses, menstruation</i>
-rrhea	discharge, flow	dia/ rrhea (diaˈrhea): abnormally frequent discharge or flow of fluid fecal matter from the bowel. <i>dia-: through, across</i>
-rrhexis	rupture	arteri/o/ rrhexis (arterioˈrrhexis): rupture of an artery. <i>arteri/o: artery</i>
-sclerosis	abnormal condition of hardening	arteri/o/ sclerosis (arterioscleˈrosis): abnormal condition of hardening of an artery. <i>arteri/o: artery</i>
-spasm	involuntary contraction, twitching	blephar/o/ spasm (ˈblepharospasm): twitching of the eyelid. <i>blephar/o: eyelid</i>
-stasis	stopping, controlling	hemo/ stasis (hemoˈstasis): arrest of bleeding. <i>hem/o: blood</i> Hemostasis is the normal bodily response to stop bleeding or hemorrhaging.
-stenosis	narrowing, stricture	arteri/o/ stenosis (arteriosteˈnosis): abnormal narrowing of an artery. <i>arteri/o: artery</i>
-toxic	poison	hepat/o/ toxic (ˈhepatotoxic): poisonous to the liver. <i>hepat/o: liver</i>
-trophy	nourishment, development	dys/ trophy (ˈdystrophy): bad nourishment. <i>dys-: bad; painful; difficult</i> Dystrophy is an abnormal condition caused by improper nutrition or altered metabolism.

*The *i* in *pelv/i/meter* and *pelv/i/metry* and the *e* in *chol/e/lithiasis* and *chol/e/lith* are exceptions to the rule of using the connecting vowel *o*.

Exercises (Building Pathological and Related Terms)

1. Write the suffix that means “condition of” in each of the following medical terms. Practice pronouncing the terms. The first one is completed for you.

Term	Suffix
1) Thrombosis (having a blood clot in a vessel)	-osis
2) Hypokalemia (deficiency of potassium in the bloodstream)	
3) Cystolithiasis (presence of a urinary calculus in the bladder)	
4) Sclerosis (hardening)	
5) Psoriasis (skin disease)	
6) Dermatosis (any noninflammatory disorder of the skin)	
7) Esophagostomiasis (parasitic intestinal infection)	
8) Coptosis (a state of perpetual fatigue)	
9) Dysemia (any abnormal condition or disease of the blood)	
10) Hypochondriasis (anxiety disorder)	
11) Cheilosis (swelling and fissuring of the lips)	
12) Craniosclerosis (abnormal calcification and thickening of the cranial bones)	

2. Use the suffixes in this list to build diagnostic, pathological, and related terms in the right column that reflect the meanings in the left column. Think whether you need to use a combining vowel in each term.

-algia	-graph	-metry	-penia	-rrhage
-cele	-iasis	-oma	-phagia	-rrhea
-ectasis	-malacia	-osis	-phasia	-rrhexis
-emia	-megaly	-pathy	-plegia	-spasm
-genesis				

Meaning	Incomplete Term
1) Tumor of the liver:	hepat/___/
2) Pain (along the course) of a nerve:	neur/___/
3) Dilation of a bronchus:	bronchi/___/
4) Producing or forming cancer:	carcin/___/

5) Abnormal condition of the skin:	dermat/___/
6) Enlargement of the kidney:	nephr/___/
7) Discharge or flow from the ear:	ot/___/
8) Rupture of the uterus:	hyster/___/
9) Spasm or twitching of the eyelid:	blephar/___/
10) Herniation of the bladder:	cyst/___/
11) Bursting forth (of) blood:	hem/___/
12) Abnormal condition of a stone or calculus:	lith/___/
13) Paralysis affecting one side (of the body):	hemi/___/
14) Disease of muscle (tissue):	my/___/
15) Difficult or painful swallowing or eating:	dys/___/
16) Softening of the bones:	oste/___/
17) Without (or absence of) speech:	a/___/
18) White blood condition:	leuk/___/
19) Deficiency in red (blood) cells:	erythr/___/
20) Measuring the pelvis:	pelv/___/

3. Identify terms containing diagnostic suffixes based on their suggested meanings. Use Appendices B and D to help you look for appropriate word roots and prefixes present in the terms.

Meaning	Term
1) Measurement of the larynx:	
2) A lighted instrument that is used to examine the inside of the eye, including the retina and the optic nerve:	
3) A record or display obtained by ultrasonic scanning:	
4) A visual record of internal structures on specially sensitized film:	
5) A noninvasive device used to measure the acuity of hearing:	
6) The examination of the embryo at 9-10 weeks' gestation through the intact membranes by introducing an endoscope into the exocoelomic space transcervically or transabdominally:	
7) Measurement of tension or pressure, e.g., intraocular pressure:	
8) A diagnostic test that measures the electrical activity within muscle fibers in response to nerve stimulation:	

9) A complete detailed record of the findings from a blood examination:	
10) A medical instrument used in listening to sounds produced within the body, chiefly in the heart or lungs:	
11) A photoelectric device for determining the oxygen saturation of the blood:	
12) The graphic recording of the venous pulse:	
13) A surgical procedure that allows a surgeon to access the inside of the abdomen and pelvis without having to make large incisions in the skin:	
14) An instrument used to record many physiologic responses simultaneously; lie detector:	

4. Use the meanings in the right column to complete the pathological and related terms in the left column. Think whether you need to use a combining vowel in each term.

Incomplete Term	Meaning
1) bronchi/___/	dilation of a bronchus
2) chol/___/	gallstone
3) carcin/___/	forming or producing cancer
4) oste/___/	softening of a bone
5) hepat/___/	enlargement of the liver
6) cholelith/___/	abnormal condition of gallstones
7) hepat/___/	herniation of the liver
8) neur/___/	disease of the nerves
9) dermat/___/	abnormal condition of the skin
10) hemi/___/	paralysis of one half of the body
11) dys /___/	difficult swallowing
12) a/___/	without (or absence of) speech
13) cephal/___/	pain in the head; headache
14) blephar/___/	twitching of the eyelid
15) hyper/___/	excessive formation (of an organ or tissue)

5. Read the following sentences to yourself or a partner. Circle the medical suffixes in the words, then explain the meaning of each suffix and the meaning of the term which contains it.

- 1) People with diabetic neuropathy need to take special care of their feet.
- 2) Roger suffered from a sore, infected throat off and on over many years. Finally, at age 12, he had a tonsillectomy. Now, this health situation has been resolved.

- 3) Mrs. Henderson has just been diagnosed with anemia. According to the lab reports, her vitamin B 12 count is very low.
- 4) The College of Physicians and Surgeons can provide a list of oncologists who are registered in your state or province.
- 5) Achondroplasia occurs in all races and with equal frequency in males and females and affects about one in every 40,000 children.



2.3. GRAMMATICAL SUFFIXES

Grammatical suffixes are attached to word roots to form parts of speech, such as adjectives and nouns, or singular or plural forms of medical terms. They are also used to denote a diminutive form, or smaller version, of a term, for example, *tubule*, which means *a small tube*. Many of these suffixes are used in the English language (see Table 2.3.1).

Table 2.3.1	Adjective, Noun, and Diminutive Suffixes		
	<i>This table lists adjective, noun and diminutive suffixes along with their meanings and word analyses.</i>		
	Suffix	Meaning	Term Analysis
Adjective Suffixes			
	-ac	pertaining to	cardi/ ac ('cardiac): pertaining to the heart. <i>cardi: heart</i>
	-al		neur/ al ('neural): pertaining to a nerve. <i>neur: nerve</i>
	-ar		muscul/ ar ('muscular): pertaining to a muscle. <i>muscul: muscle</i>
	-ary		pulmon/ ary ('pulmonary): pertaining to the lungs. <i>pulmon: lung</i>
	-eal		esophag/ eal (esopha'geal): pertaining to the esophagus. <i>esophag: esophagus</i>
	-ic		thorac/ ic (tho'racic): pertaining to the chest. <i>thorac: chest</i>
	-ical*		path/o/log/ ical (patho'logical): pertaining to the study of a disease. <i>path/o: disease</i> <i>log: study of</i>
	-ile		pen/ ile ('penile): pertaining to the penis. <i>pen: penis</i>
	-ior		poster/ ior (pos'terior): pertaining to the back of the body. <i>poster: back (of body), behind, posterior</i>

-ory		audit/ ory (‘auditory): pertaining to the ear; pertaining to the sense of hearing. <i>audit: hearing</i>
-ous**		cutane/ ous (cu’taneous): pertaining to the skin. <i>cutane: skin</i>
-tic		acous/ tic (a’coustic): pertaining to hearing. <i>acous: hearing</i>
-form	resembling to	muci/ form (‘muciform): like or resembling mucus. <i>muci: mucus</i>
-oid		muc/ oid (mu’coid): resembling mucus. <i>muc: mucus</i>
Noun Suffixes		
-esis	condition	di/ur/ esis (diu’resis): abnormal secretion of large amounts of urine. <i>di-: double</i> <i>ur: urine</i>
-ia		pneumon/ ia (pneu’monia): infection of the lung usually caused by bacteria, viruses, or diseases. <i>pneumon: air; lung</i>
-ism		hyper/thyroid/ ism (hyper’thyroidism): condition characterized by overactivity of the thyroid gland. <i>hyper-: excessive, above normal</i> <i>thyroid: thyroid gland</i>
-iatry	medicine; treatment	pod/ iatry (po’diatry): specialty concerned with treatment and prevention of conditions of the feet. <i>pod: foot</i>
-ician	specialist	obstetr/ ician (obste’trician): physician who specializes in the branch of medicine concerned with pregnancy and childbirth. <i>obstetr: midwife</i>
-ist		dent/ ist (‘dentist): specialist who diagnoses and treats diseases and disorders of teeth. <i>dent: teeth</i>
-logist	specialist in the study of	hemat/o/log/ ist (hema’tologist): physician who specializes in the treatment of disorders of blood and blood-forming tissues. <i>hemat/o: blood</i> <i>log: study of</i>
-y	condition; process	neur/o/path/ y (neu’ropathy): disease condition of the nerves. <i>neur/o: nerve</i> <i>path: disease</i>
Diminutive Suffixes		
-icle	small, minute	ventr/ icle (‘ventricle): a small cavity, as of the brain or heart. <i>ventr: belly, belly side</i>

	-ole		arteri/ ole (ar'teriole): the smallest of the arteries; a minute artery. <i>arteri: artery</i> Arteries narrow to form arterioles (small arteries), which branch into capillaries (the smallest blood vessels).
	-ule		ven/ ule ('venule): a small vein continuous with a capillary. <i>ven: vein</i>

*The suffix *-ical* is a combination of *-ic* and *-al*.

**The suffix *-ous* also means *composed of or producing*.

Exercises (Selecting Adjective, Noun, and Diminutive Suffixes)

1. Identify the suffix meaning “pertaining to” or “resembling” in each of the following terms. The first one is completed for you.

Term	Suffix
1) Salivary (pertaining to saliva)	<i>-ary</i>
2) Pelvic (pertaining to the pelvis)	
3) Neurotic (pertaining to neurosis)	
4) Fibrous (pertaining to fibers)	
5) Epileptiform (resembling epilepsy)	
6) Ovoid (resembling an egg)	
7) Topical (pertaining to a surface)	
8) Virile (masculine)	
9) Vocal (pertaining to the voice)	
10) Surgical (pertaining to surgery)	
11) Nuclear (pertaining to a nucleus)	
12) Respiratory (pertaining to respiration)	
13) Dietary (pertaining to the diet)	
14) Anatomical (pertaining to anatomy)	
15) Muscular (pertaining to muscles)	

2. Use the adjective suffixes in the following list to create medical terms. The first one is completed for you.

<i>-ac</i>	<i>-ary</i>	<i>-ic</i>	<i>-tic</i>
<i>-al</i>	<i>-eal</i>	<i>-ous</i>	<i>-ical</i>
<i>-ile</i>	<i>-oid</i>	<i>-ar</i>	<i>-ior</i>
<i>-ory</i>	<i>-form</i>		

Element	Medical Term	Meaning
1) thorac/	<i>thoracic</i>	pertaining to the chest
2) gastr/		pertaining to the stomach
3) bacteri/		pertaining to bacteria
4) aqua/		pertaining to water
5) axill/		pertaining to the armpit
6) cardi/		pertaining to the heart
7) spin/		pertaining to the spine
8) ventricul/		pertaining to the ventricle
9) esophag/		pertaining to the esophagus
10) cephal/		relating to the head
11) membran/		pertaining to a membrane
12) duoden/		pertaining to the duodenum
13) excret/		pertaining to excretion
14) anter/		pertaining to the front
15) pulmon/		pertaining to the lungs
16) neurolog/		pertaining to the study of nerves
17) febr/		pertaining to fever
18) angi/		resembling blood vessels
19) puri/		resembling pus
20) cyan/		pertaining to blueness
21) sens/		relating to the senses or sensation

3. Use the noun suffixes in the following list to create medical terms.

<i>-esis</i>	<i>-ism</i>	<i>-iatry</i>	<i>-ia</i>
<i>-ist</i>	<i>-ician</i>	<i>-y</i>	

Element	Medical Term	Meaning
1) intern/		a specialist in internal medicine
2) leuk/em/		condition of “white” blood
3) sigmoid/o/scop/		visual examination of the sigmoid colon
4) alcohol/		condition of (excessive) alcohol
5) pod/		treatment of the feet
6) ophthalm/o/log/		a doctor who treats eye diseases
7) allerg/		a specialist in treating allergic disorders

8) man/		condition of madness
9) special/		a physician whose practice is limited to a particular branch of medicine or surgery
10) aden/		chronic inflammation and enlargement of a lymph gland
11) psych/		the study and treatment of mental illness, emotional disturbance, and abnormal behaviour
12) optic/		someone whose job is examining people's eyes and selling glasses or contact lenses to correct sight problems
13) di/ur/		excessive discharge of urine
14) dermat/o/log/		the branch of medicine concerned with the diagnosis and treatment of skin disorders

4. Use the diminutive suffixes in the following list to create medical terms.

<i>-icle</i>	<i>-ole</i>	<i>-ule</i>
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Element	Medical Term	Meaning
1) arteri/		minute artery
2) molec/		the simplest unit of a chemical substance, usually a group of two or more atoms
3) ventr/		small cavity
4) ven/		small vein
5) bronchi/		a minute thin-walled branch of a bronchus
6) pust/		a small blister or pimple on the skin containing pus
7) test/		either of the two oval organs that produce sperm in men and other male mammals, enclosed in the scrotum behind the penis
8) pap/		a small solid usually conical elevation of the skin
9) aur/		the projecting part of the ear lying outside the head
10) nod/		a small mass of rounded or irregular shape



2.4. PLURAL SUFFIXES

Many medical terms have Greek or Latin origins* and follow the rules of these languages in building singular and plural forms. Once you learn these rules, you will find that they are easy to apply. You will also find that some English endings have also been adopted for commonly used medical terms. When a word changes from a singular to a plural form, the suffix of the word is the part that changes (see Table 2.4.1).

**Find an alphabetized list of common Greek and Latin medical nouns in singular and plural forms in Appendix E.*

Table 2.4.1	Plural Suffixes			
	Singular Suffix	Plural Suffix	Singular Example	Plural Example
	a	ae	gingiva (gum)	gingiv ae
	ax	aces	thor ax (part of the human body enclosed by the ribs)	thorac es
	en	ina	foram en (opening)	foramin a
	ex, ix, yx	ices	append ix (something added)	appendic es
	ies	ietes	pari es (wall of an organ or bodily cavity)	pariet es
	is	es	diagnos is (identification of disease)	diagnos es
	ma	mata / mas	stig ma (mark or scar)	stig mata / stig mas
	nx (anx, inx, ynx)	nges	phalan nx (bone of finger or toe)	phalang es
	on	a	spermatozoo n (male reproductive cell)	spermatozoa
	um	a	ovo um (egg)	ova
	us	i	embolo us (abnormal particle circulating in the blood)	emboli
	BUT*: Apparatus – apparatus Arcus – arcus Corpus – corpora Iris – irides Sinus – sinuses Virus – viruses			

**Find more exceptions in Appendix E.*

Exercises (Selecting Plural Suffixes)

1. Write the plural form of each of the following terms, then explain their meanings.

Term in Singular	Term in Plural	Meaning of the Term
1) fornix		
2) vertebra		
3) iris		
4) keratosis		
5) sinus		
6) bronchus		
7) spermatozoon		
8) septum		
9) coccus		
10) ganglion		
11) meninx		
12) prognosis		
13) omentum		
14) thrombus		
15) appendix		
16) virus		
17) bacterium		
18) testis		
19) corpus		
20) nevus		
21) matrix		
22) serum		
23) focus		
24) pelvis		
25) adenoma		

2. Change the following sentences from plural to singular. Pay special attention to the terms in bold. Use Appendix E to help you.

- 1) They are situated precisely in those same ***lunulae*** in which you find the form of the gap, the rim.
- 2) Choroid ***plexi*** are found in each of the four brain ventricles.
- 3) ***Salpinges*** are trumpet-shaped tubes, as Fallopian or Eustachian tubes.

- 4) The investigated *phenomena* are not frequent.
- 5) *Fibromata* may be elevated or deep seated, and in some instances are pedunculated.
- 6) Food plants have to compete with weeds pests, *viruses* and *fungi*.
- 7) Tentorial dural arteriovenous *fistulae* are rare clinically.
- 8) The medial *crura* are supported by their elastic fibrous attachments to the caudal septum and the soft tissue interposed between their feet and the premaxillary area.
- 9) Does the child respond to auditory *stimuli*?
- 10) The *analyses* of the results did not prove his *hypotheses*.
- 11) Nuclear energy is produced using the heat generated by splitting the *nuclei* of atoms of certain elements.
- 12) What *criteria* did the scientists use?
- 13) These hemorrhages are referred to as *petechiae* when small; if large, they may become a large area of discoloration of the skin.
- 14) The *testes* are engorged and swell.
- 15) There are continuous *striae* crossing between the vulva and anus.
- 16) Invasion and *metastases* largely determine the clinical course of colorectal *carcinomas*.
- 17) Esophageal *varices* develop when normal blood flow to your liver is blocked.
- 18) This procedure takes cells from the *villi*, i.e., tiny fingerlike projections on the placenta.
- 19) These are called *rugae*, and enable the stomach to increase dramatically in size when it fills with food.
- 20) She projects her own *neuroses* onto her colleagues.

3. Revise the following sentences for subject-verb agreement by detecting errors the in plural/singular forms of nouns and correcting them. Use Appendix E to help you.

- 1) Many bacteriums are of very great importance in industry.
- 2) The fringelike fimbria transport ovulated eggs from the ovarian surface to the infundibulum.
- 3) Her hypotheses concerns the role of electromagnetic radiation.
- 4) Cervical papilla occur anteriorly in the esophageal region, and caudal papilla posteriorly at the tail.
- 5) It is difficult to explain all the phenomenon that exist in the natural world.
- 6) On detailed examination, the larva were observed on the bulbar conjunctiva and in fornices.
- 7) Analysis were conducted on the raw datas.
- 8) Stop the alveolus doing their job and a patient will suffocate.
- 9) Any pigment nevi that is chronically irritated should be excised.
- 10) The gingivae is a pink-colored mucous membrane that covers part of the teeth and the alveolar bone.
- 11) What were the criterion for the assessment of the project?
- 12) More sophisticated computer-designed prosthesis for joint replacements allow many more patients to benefit.
- 13) How does an ova differ from a zygote?
- 14) The itching is intense, and in consequence their apex are excoriated.
- 15) These foramen are confluent with the orbital fissure in many sharks.

UNIT 2. REVIEW

1. Look at the medical terms given below. Choose medical terms containing surgical suffixes and put them in the table. Then identify the suffix in each term and its meaning.

electromyography lithotripsy hepatomegaly
cholecystectomy pleurodesis vulvodynia
amniocentesis ovariorrhexis cordopexy
craniostenosis lymphadenotomy cranioclasia
appendicectomy osteorrhaphy thrombocytopenia
otoplasty nephroptosis tenolysis

Terms Containing Surgical Suffixes	Surgical Suffixes	Meanings of Surgical Suffixes
1)		
2)		
3)		
4)		
5)		
6)		
7)		
8)		
9)		
10)		

2. Underline suffixes in the following terms, then give the meaning of each term.

- 1) osteitis
- 2) psychosis
- 3) renal
- 4) osteotomy
- 5) nephrectomy
- 6) ophthalmoscopy
- 7) ophthalmoscope
- 8) sarcoma
- 9) hematologist
- 10) thoracentesis
- 11) pathogenesis
- 12) diaphoresis
- 13) urethrostenosis
- 14) puriform

- 15) thrombocytopenia
 16) necrotic
 17) gastrorrhagia
 18) rhinorrhea
 19) angiorrhesis
 20) lymphostasis

3. Identify the adjective suffix in each of the following terms that means “pertaining to” or “resembling”.

Term	Adjective Suffix
1) physiologic	
2) local	
3) cutaneous	
4) lymphoid	
5) circular	
6) cellular	
7) virile	
8) basic	
9) puriform	
10) salivary	
11) anatomical	
12) genetic	
13) oral	
14) exploratory	
15) rheumatoid	

4. Match the following medical terms with their meanings. Then identify the suffix and the category (type) it belongs to. The first is done for you.

Term	Meaning	Suffix	Suffix Type
1) obstetrician _a_	a) a physician who specializes in the branch of medicine concerned with pregnancy and childbirth	-ician	noun suffix
2) ventricle ____	b) an instrument for measuring the air entering and leaving the lungs		
3) cardiomyopathy ____	c) of, relating to, or caused by bacilli		
4) anorexia ____	d) a physician specializing in the eye		
5) spirometer ____	e) a chronic disease of the heart muscle		
6) bacillary ____	f) the swallowing of excess air		

7) metrorrhagia ____	g) situated above, or directed upward		
8) ophthalmologist ____	h) an X-ray of the kidneys and ureters		
9) lymphoid ____	i) a small cavity or chamber, as in the brain or heart		
10) pyelogram ____	j) any of the small terminal twigs of an artery that ends in capillaries		
11) enuresis ____	k) pain in one or more joints		
12) arteriole ____	l) the branch of medicine concerned with the study, diagnosis, and treatment of mental disorders		
13) atrophy ____	m) bleeding from the uterus not associated with menstruation		
14) aerophagia ____	n) decrease in size or wasting away of a body part or tissue		
15) psychiatry ____	o) of, relating to, or resembling lymph		
16) ureteroscopy ____	p) poisoning from a spider bite		
17) arthralgia ____	q) softening of the arteries		
18) arachnidism ____	r) examination of the interior of a ureter by means of a ureteroscope		
19) superior ____	s) loss of appetite especially when prolonged		
20) arteriomalacia ____	t) the involuntary discharge of urine; urinary incontinence		

5. Underline singular suffixes of the medical nouns in the table given below. Then write the plural form for each noun.

Singular Noun	Plural Noun
1) prognosis	
2) bacterium	
3) fibroma	
4) patella	
5) virus	
6) pharynx	
7) fungus	
8) protozoon	
9) foramen	
10) apex	
11) corpus	

6. Underline plural endings of the medical nouns in the table given below. Then write the singular form for each noun.

Plural Noun	Singular Noun
1) ganglia	
2) vertebrae	
3) indices	
4) septa	
5) villi	
6) meninges	
7) testes	
8) apparatus	
9) irides	
10) lumina	
11) blastomata	

7. Find errors in the plural/singular forms of nouns and correct them. Use Appendix E to help you.

- 1) Pathological anastomoses results from trauma or disease and may involve veins, arteries, or intestines.
- 2) As extensive controlled annotated corpus were not still available at the time of the experiments.
- 3) The lactic acid bacillus are given either in the form of tablets or milk soured by them, or cheese made from the sour milk.
- 4) Bursa are saclike cavities or potential cavities that contain synovial fluid located at tissue sites where friction occurs (e.g., where tendons or muscles pass over bony prominences).
- 5) Both virus cause fever and loss of appetite.
- 6) The lumina was kept constantly in view so that the position of the instrument did not change.
- 7) The viscus were examined for anisakis under a dissection microscope.
- 8) Enhanced computed tomography showed multiple nodules and lymphadenopathies in both axilla.
- 9) The bicipital aponeuroses originates from the distal insertion of the biceps brachii.
- 10) Larger pneumothorax are most commonly treated with chest tube thoracostomy or insertion of pigtail catheters with one-way valves.
- 11) Species of both genus are frequently found on gorgonians and corals.
- 12) The chorda tendineae are attached to papillary muscles that cause tension to better hold the valve.
- 13) Over half of these locus were successfully amplified in two congeneric species.
- 14) The circle of the eyes, the naked membrane of the beak, and the feet, are flesh-colored; the iris are orange.
- 15) The prognoses after the operation was for a full recovery.
- 16) Endoscopic stigma of recent hemorrhage allow the identification of lesions with a high risk of rebleeding.

CASE STUDY: HEALTH PROBLEMS ON RETURN FROM THE RAIN FOREST

A.P., a 44-year-old archaeologist and university professor, returned from a 6-month expedition in the rain forest of South America suffering from a combination of physical symptoms and conditions that would not subside on their own. He was fatigued, yet unable to sleep through the night. He also had a mild fever, night sweats, occasional dizziness, double vision, and mild crampy abdominal pain accompanied by intermittent diarrhea. In addition, he had a nonhealing wound on his ankle from an insect bite. He made an appointment with his family doctor, an internist.

On examination, A.P. was febrile (feverish) with a temperature of 101°F. His heart and lungs were normal, with a slightly elevated heart rate. His abdomen was tender to palpation (touch), and his bowel sounds were active and gurgling to auscultation (listening with a stethoscope). His skin was dry and warm. He had symmetrical areas of edema (swelling) around both knees and tenderness over both patellae (kneecaps). The ulceration on his left lateral ankle had a ring of necrosis (tissue death) surrounding an area of granulation tissue. There was a small amount of purulent (pus-containing) drainage.

A.P.'s doctor ordered a series of hematology lab studies and stool cultures for ova and parasites. The doctor suspected a viral disease, possibly carried by mosquitoes, indigenous to tropical rain forests. He also suspected a form of dysentery typically caused by protozoa. A.P. was also possibly anemic, dehydrated, and septic (infected). The doctor was confident that after definitive diagnosis and treatment, A.P. would gain relief from his insomnia, diplopia (double vision), and dizziness.

CASE STUDY QUESTIONS

1. Multiple choice. Select the best answer and write the letter of your choice to the left of each number.

- _____ 1) Diplopia, the condition of having double vision, has the suffix:
- a. lopia
 - b. opia
 - c. ia
 - d. pia
 - e. ploia

- _____ 2) The adjective "septic" is formed from the noun:
- a. sepsis
 - b. sepsosis
 - c. septemia
 - d. septy
 - e. anemia

- _____ 3) A.P. was suspected of having anemia (diminished hemoglobin). The adjective form of the noun anemia is _____, and the field of health science devoted to the study of blood is called _____.
- a. anemic; hematology
 - b. hematosia; hematism
 - c. dehemia; hematomegaly
 - d. anemic; parasitology
 - e. microhematic; hemacology

2. Write the suffix that means "condition of" in each of the following terms:

- 11) necrosis _____

- 12) dysentery _____
13) insomnia _____

3. Write the adjective ending of each of the following terms:

- 14) febrile _____
15) symmetrical _____
16) anemic _____

4. Write the singular form of each of the following terms:

- 17) patellae _____
18) ova _____
19) protozoa _____

5. Write a term from the case study that means each of the following:

- 20) The word virus used as an adjective _____
21) The noun form of the adjective necrotic _____
22) Expert in the field of archeology _____
23) Expert in the field of internal medicine _____
24) The noun abdomen used as an adjective _____

UNIT 3. PREFIXES IN MEDICAL TERMINOLOGY

Most medical terms contain a root or a combining form with a suffix. Some of them also contain prefixes. A prefix is a word element located at the beginning of a word. Substituting one prefix for another alters the meaning of the term. For example, in the term *macro/cyte*, *macro-* is a prefix meaning *large*; *-cyte* is a suffix meaning *cell*. A *macrocyte* is a *large cell*. By changing the prefix *macro-* to *micro-* (*small*), the meaning of the term changes. A *microcyte** is a *small cell*. See Table 3.1 for three other examples of how a prefix changes the meaning of a term.

*The suffix “-cyte” can also be broken down as a root “cyt” with a noun ending “e” (cyt/e).

Table 3.1	Changing Prefixes and Meanings				
	<i>In this table, each term has the same root, “nat” (“birth”) and suffix “-al” (“pertaining to”). By substituting different prefixes, new terms with different meanings are formed.</i>				
	Prefix	+ Word Root +	Suffix	= Medical Term	Meaning
	pre- (before)	nat (birth)	-al (pertaining to)	prenatal	pertaining to (the period) before birth
	peri- (around)	nat (birth)	-al (pertaining to)	perinatal	pertaining to (the period) around birth
	post- (after)	nat (birth)	-al (pertaining to)	postnatal	pertaining to (the period) after birth



TYPES OF PREFIXES

Learning the major types of prefixes, such as prefixes of position, number and measurement, direction, as well as some others, will help you master medical terminology.

3.1. PREFIXES OF POSITION*

Prefixes of position describe a place or location (see Table 3.1.1).

Table 3.1.1	Prefixes of Position		
	<i>This table lists commonly used prefixes of position along with their meanings and term analyses.</i>		
	Prefix	Meaning	Term Analysis
	epi-	above, upon	epi/gastr/ic (epi'gastric): pertaining to above the stomach. <i>gastr: stomach</i> <i>-ic: pertaining to</i>

hypo-	under, below, deficient	<p>hypo/derm/ic (hypo'dermic): pertaining to under the skin. <i>derm: skin</i> <i>-ic: pertaining to</i> Hypodermic injections are given under the skin.</p> <p>hypo/trophy (hy'potrophy): progressive degeneration of an organ or tissue caused by loss of cells. <i>-trophy: nourishment, development</i></p>
infra-	under, below	<p>infra/cost/al (infra'costal): below the ribs. <i>cost: ribs</i> <i>-al: pertaining to</i></p>
sub-		<p>sub/nas/al (sub'nasal): under the nose. <i>nas: nose</i> <i>-al: pertaining to</i></p>
inter-	between	<p>inter/cost/al (inter'costal): between the ribs. <i>cost: ribs</i> <i>-al: pertaining to</i></p>
post-	after, behind	<p>post/nas/al (post'nasal): relating to the posterior portion of the nasal cavity. <i>nas: nose</i> <i>-al: pertaining to</i></p> <p>post/nat/al (post'natal): pertaining to (the period) after birth. <i>nat: birth</i> <i>-al: pertaining to</i></p>
pre-	before, in front of	<p>pre/nat/al (pre'natal): pertaining to (the period) before birth. <i>nat: birth</i> <i>-al: pertaining to</i></p> <p>pre/cost/al (pre'costal): anterior to the ribs. <i>cost: rib</i> <i>-al: pertaining to</i></p>
pro-		<p>pro/gnosis (prog'nosis): knowing before. <i>-gnosis: knowing</i> Prognosis is the prediction of the course and end of a disease and the estimated chance of recovery.</p>
retro-	backward, behind	<p>retro/version (retro'version): turning backwards. <i>-version: turning</i> Retroversion refers to tipping backward of an organ (such as the uterus) from its normal position.</p> <p>retro/lent/al (retro'lental): situated or occurring behind the lens of the eye. <i>lent: lens</i> <i>-al: pertaining to</i></p>

ipsi-	same	ipsi/lateral (ipsi'lateral): situated or appearing on or affecting the same side of the body. <i>lateral: of or relating to the side</i>
dextr-	right	dextr/o/cardia (dextro'cardia): location of the heart in the right side of the chest. <i>cardi: heart</i>
sinistr-	left	sinistr/ad ('sinistrad): toward the left side. <i>-ad: in the direction of; toward</i>
ec-, ecto-	out; outside	ecto/derm ('ectoderm): outermost layer of the developing embryo. <i>derm: skin</i>
ex-	away from; outside	ex/o/derm ('exoderm): outermost layer of the developing embryo (another name for <i>ectoderm</i>). <i>derm: skin</i>
end-, end/o-	in; within	end/o/scope ('endoscope): a device for viewing the inside of a cavity or organ. <i>-scope: instrument for examining</i>
mes-	middle	mes/encephalon (mesen'cephalon): midbrain. <i>encephalon: brain</i>
syn-, sym- (used before b, m, p)	together	syn/aesthesia (synaes'thesia): a sensation experienced in a part of the body other than the part stimulated. <i>aesthesia: the ability to feel or perceive sensations</i>
tel-	end	tel/angion (tel'angion): a terminal vessel. <i>angi/o: vessel</i>

**Some prefixes of position may also indicate number and measurement, direction, etc.*

Exercises (Selecting Prefixes of Position)

1. Identify and define the prefix in each of the following terms.

Term	Prefix	Meaning of the Prefix
1) synthesis		
2) extract		
3) ectopic		
4) symbiosis		
5) endoplasm		
6) mesarteritis		
7) epicondyle		
8) retrobuccal		
9) telalgia		
10) sinistrocerebral		
11) preanesthetic		

12) interacinar		
13) postadolescence		
14) infraclavicular		
15) dextrogastrica		

2. Match the following terms with the definitions in the numbered list. Identify the prefix in each term.

<i>preanal</i>	<i>subabdominal</i>	<i>infracortical</i>	<i>sinistromanual</i>
<i>postpartum</i>	<i>endoceliac</i>	<i>epicardium</i>	<i>interarticular</i>
<i>infracerebral</i>	<i>dextromanual</i>	<i>retrocervical</i>	<i>symbiosis</i>
<i>postoperative</i>	<i>ectoderm</i>	<i>synapomorphy</i>	<i>endobronchitis</i>

Definition	Term	Prefix
1) Right-handed.		
2) Left-handed.		
3) Between articulating surfaces.		
4) Inflammation of the epithelial lining of the bronchi.		
5) Pertaining to that portion of the nervous system below the level of the cerebrum.		
6) After surgery.		
7) Beneath the cortex of any organ.		
8) The living together in more or less intimate association or close union of two dissimilar organisms.		
9) After childbirth.		
10) Anterior to the anus.		
11) The inner layer of the pericardium that is in actual contact with the surface of the heart.		
12) Within one of the body cavities.		
13) Behind the cervix.		
14) The outermost of the three primary germ layers of an embryo.		
15) Below the abdomen.		
16) The sharing of derived characters by different species.		

3. Write the opposite of each of the following terms. Explain the meanings of the terms.

Term	Meaning	Opposite Term	Meaning
1) exogenous			
2) sinistromanual			
3) endoderm			
4) prenatal			
5) subnasal			
6) endoplasm			
7) infracostal			
8) dextrogastrica			
9) prognosis			
10) epigastric			



3.2. PREFIXES OF NUMBER AND MEASUREMENT

Prefixes of number and measurement describe an amount, size, or degree of involvement (see Table 3.2.1).

Table 3.2.1	Prefixes of Number and Measurement		
	<i>This table lists commonly used prefixes of number and measurement along with their meanings and term analyses.</i>		
	Prefix	Meaning	Term Analysis
	bi-	two, twice	bi /later/al (bi'lateral): pertaining to two sides. <i>later: side</i> <i>-al: pertaining to</i>
	di-		di /dactyl/ism (didac'tylism): the presence of only two digits on a hand or foot. <i>dactyl: fingers; toes</i> <i>-ism: condition</i>
	dipl-	double	dipl /opia (dip'lopa): double vision. <i>-opia: vision</i>
	diplo-		diplo /bacteri/al (diplobac'terial): bacteria linked together in pairs. <i>bacteri: bacteria</i> <i>-al: pertaining to</i>
	hemi-	one half	hemi /plegia (hemi'plegia): paralysis of one half of the body. <i>-plegia: paralysis</i>

semi-	half; partial	semi /circular (semi'circular): forming a half circle or an incomplete circle. <i>circular: having the form of a circle</i>
hyper-	excessive, above normal	hyper /calc/emia (hypercal'cemia): excessive calcium in the blood. <i>calc: calcium</i> <i>-emia: blood condition</i>
hypo-	deficient	hypo /trophy (hy'potrophy): progressive degeneration of an organ or tissue caused by loss of cells. <i>-trophy: nourishment, development</i>
macro-	large	macro /cyte ('macrocyte): large cell. <i>-cyte: cell</i>
micro-	small	micro /scope ('microscope): instrument for examining small (objects). <i>-scope: instrument for examining</i> The microscope is an optical instrument that greatly magnifies minute objects.
mono-	one	mono /therapy (mono'therapy): one treatment. <i>-therapy: treatment</i> An example of monotherapy is treatment using only a single drug or a single treatment modality.
uni-		uni /nucle/ar (uni'nuclear): pertaining to one nucleus. <i>nucle: nucleus</i> <i>-ar: pertaining to</i>
multi-	many, much	multi /gravidia (multi'gravidia): woman who has been pregnant more than once. <i>-gravidia: pregnant woman</i>
poly-		poly /phobia (poly'phobia): fear of many things. <i>-phobia: fear</i>
nulli-	none	nulli /parous (nu'lliparous): of, relating to, or being a female that has not borne offspring. <i>parous: having given birth one or more times</i> A woman who hasn't given birth is referred to as nulliparous.
primi-	first	primi /gravidia (primi'gravidia): woman during her first pregnancy. <i>-gravidia: pregnant woman</i>
quadr-, quadri-	four	quadri /plegia (quadri'plegia): paralysis of four limbs. <i>-plegia: paralysis</i>
tetra-		tetra /paresis (tetrapa'resis): muscular weakness affecting all four extremities. <i>paresis: slight or partial paralysis</i>
tri-	three	tri /ceps ('triceps): three heads. <i>-ceps: head</i> Triceps describes a muscle arising by three heads with a single insertion.

Exercises (Selecting Prefixes of Number and Measurement)

1. Fill in the blanks in the sentences given below. The first is done for you as an example.

- 1) The term “primigravida” indicates a woman who is pregnant for the *first* time.
- 2) Monoclonal refers to a colony (clone) derived from cell(s).
- 3) The quadriceps muscle has part(s).
- 4) “To unify” means to make two or more parts into part(s).
- 5) The term “semilunar” means moon(s).
- 6) A dichotomy has part(s).
- 7) A multicellular organism has cell(s).
- 8) A tetralogy is composed of elements or factors.
- 9) A triangle has angle(s).
- 10) “Bipolar” means having pole(s).
- 11) The term “polyadenitis” refers to inflammation of gland(s).

2. Provide a prefix that is similar in meaning (synonymous) to each of the following listed below.

Prefix	Synonym
1) bi-	
2) poly-	
3) semi-	
4) mono-	
5) tetra-	

3. Provide a prefix that is opposite in meaning (antonymous) to each of the following listed below.

Prefix	Antonym
1) micro-	
2) hypo-	
3) multi-	

4. Match the following terms with the definitions in the numbered list. Identify the prefix in each term.

<i>uniceps</i>	<i>macroblepharia</i>	<i>quadriplegia</i>	<i>tricuspid</i>
<i>diptogenesis</i>	<i>dicheilia</i>	<i>primipara</i>	<i>hemiplegia</i>
<i>polyuria</i>	<i>hyperalgesia</i>	<i>tetraparesis</i>	<i>multiarticular</i>
<i>monoamniotic</i>	<i>microangiitis</i>	<i>semicoma</i>	<i>bifocal</i>

Definition	Term	Prefix
1) Excessive sensitivity to pain.		

2) Pertaining to or affecting many joints.		
3) Paralysis of four limbs.		
4) Paralysis of one half (side) of the body.		
5) Denoting two or more progeny of a multiple pregnancy that have shared a common amniotic sac.		
6) Having three points or cusps, as a valve of the heart.		
7) A partial or mild comatose state; a coma from which a person may be roused by various stimuli.		
8) Weakness of the muscles of all four limbs.		
9) A woman who has given birth to only one child.		
10) Abnormal largeness of the eyelid.		
11) A lip appearing to be double because of the presence of an abnormal fold of mucosa.		
12) Excessive excretion of urine resulting in profuse micturition.		
13) Having a single head or origin, as in muscles.		
14) The double production or formation of something that is normally single, such as a doubled part in a fetus or a double fetus.		
15) Having two focal lengths.		
16) An inflammation of very small blood vessels.		



3.3. PREFIXES OF DIRECTION

Prefixes of direction indicate a pathway or route (see Table 3.3.1).

Table 3.3.1	Prefixes of Direction		
	<i>This table lists commonly used prefixes of direction as well as their meanings and term analyses.</i>		
	Prefix	Meaning	Term Analysis
	ab-	from, away from	ab/duction (ab'duction): movement of a limb away from (an axis of) the body. <i>-duction: act of leading, bringing, conducting</i>
	ad-	toward	ad/duction (ad'duction): movement of a limb toward (an axis of) the body. <i>-duction: act of leading, bringing, conducting</i>

circum-	around	circum /ren/al (circum'renal): pertaining to around the kidney. <i>ren: kidney</i> <i>-al: pertaining to</i>
peri-		peri /odont/al (perio'dontal): pertaining to around a tooth. <i>odont: teeth</i> <i>-al: pertaining to</i>
dia-	through, across	dia /rrhea (dia'rrhea): flow through. <i>-rrhea: discharge, flow</i> Diarrhea is a condition of abnormally frequent discharge or flow of fluid fecal matter from the bowel.
trans-		trans /vagin/al (trans'vaginal): pertaining to across or through the vagina. <i>vagin: vagina</i> <i>-al: pertaining to</i>
per-	through	per /cutane/ous (percu'taneous): through the skin. <i>cutane: skin</i> <i>-ous: pertaining to</i>
ecto-	outside, outward	ecto /gen/ous (ec'togenous): forming outside the body or structure. <i>gen: forming, producing, origin</i> <i>-ous: pertaining to</i> An ectogenous infection is one that originates outside of the body.
exo-		exo /tropia (exo'tropia): turning outward (of one or both eyes). <i>-tropia: turning</i>
extra-		extra /crani/al (extra'cranial): outside the skull. <i>crani: cranium (skull)</i> <i>-al: pertaining to</i>
endo-	in, within	endo /crine ('endocrine): secrete within. <i>-crine: secrete</i> Endocrine describes a gland that secretes directly into the bloodstream.
intra-		intra /muscul/ar (intra'muscular): within the muscle. <i>muscul: muscle</i> <i>-ar: pertaining to</i>
para-*	near, beside; beyond	para /nas/al (para'nasal): beside the nose. <i>nas: nose</i> <i>-al: pertaining to</i>
super-	upper, above	super /ior (su'perior): pertaining to the upper part of a structure. <i>-ior: pertaining to</i>
supra-	above; excessive; superior	supra /ren/al (supra'renal): pertaining to above the kidney. <i>ren: kidney</i> <i>-al: pertaining to</i>

	ultra-	excess, beyond	ultra/son/ic (ultra'sonic): pertaining to sound beyond (that which can be heard by the human ear). <i>son: sound</i> <i>-ic: pertaining to</i>
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**Para- may also be used as a suffix meaning "to bear (offspring)".*

Exercises (Selecting Prefixes of Directions)

1. Identify and define the prefix in each of the following terms.

Term	Prefix	Meaning of the Prefix
1) adjacent		
2) abnormal		
3) transfer		
4) ultracautious		
5) parathyroid		
6) superciliary		
7) intracervical		
8) perspective		
9) diachronic		
10) supraorbital		
11) exoskeleton		
12) perioral		
13) circumference		
14) extracurricular		
15) endoscopy		

2. Provide a prefix that is similar in meaning (synonymous) to each of the following listed below.

Prefix	Synonym(s)
1) circum-	
2) intra-	
3) exo-	
4) dia-	

3. Provide a prefix that is opposite in meaning (antonymous) to each of the following listed below.

Prefix	Antonym(s)
1) ad-	
2) endo-	
3) extra-	



3.4. NEGATIVE PREFIXES

Negative prefixes carry a negative meaning “not”, “opposite of” (see Table 3.4.1).

Table 3.4.1	Negative Prefixes		
	This table lists commonly used negative prefixes as well as their meanings and term analyses.		
	Prefix	Meaning	Term Analysis
	a- *	without, not	a /mast/ia (a'mastia): without a breast. <i>mast</i> : breast <i>-ia</i> : condition Amastia may be the result of a congenital defect, an endocrine disorder, or mastectomy.
	an- **		an /esthesia (anes'thesia): without feeling. <i>-esthesia</i> : feeling Anesthesia may be a partial or complete loss of sensation with or without loss of consciousness.
	anti-	against	anti /bacteri/al (antibac'terial): against bacteria. <i>bacteri</i> : bacteria <i>-al</i> : pertaining to Antibacterials are substances that kill bacteria or inhibit their growth or replication.
	contra-		contra /ception (contra'ception): against conception or impregnation. <i>-ception</i> : conceiving Contraceptive techniques prevent pregnancy by means of medication, a device, or a method that blocks or alters one or more of the processes of reproduction.
	de-	down, without	de /hydrated (dehy'drated): deprived of vital water or moisture. <i>hydrated</i> : having absorbed enough water or other liquid

	dis-	absence, removal, separation	dis/abled (di'sabled): lacking ability or strength. <i>abled: capable of unimpaired function</i>
	in-***; im- (used before b, m, p)	not	in/fertile (in'fertile): not capable of initiating, sustaining, or supporting reproduction. <i>fertile: capable of initiating, sustaining, or supporting reproduction</i>
	non-		non/infecti/ous (nonin'fectious): not able to spread disease. <i>infecti: infection</i> <i>-ous: pertaining to</i>
	un-		un/healthy (un'healthy): being in a state of ill health; sick. <i>healthy: having, showing, or encouraging good health</i>

*The prefix *a-* is usually used before a consonant.

** The prefix *an-* is usually used before a vowel.

***May also mean "in" or "into" as in "inject", "inhale".

Exercises (Selecting Negative Prefixes)

1. Identify and define the negative prefix in each of the following terms.

Term	Prefix	Meaning of the Prefix
1) antibody		
2) amnesia		
3) impotent		
4) disintegrate		
5) unconscious		
6) dehumidify		
7) contralateral		
8) noninvasive		
9) apnea		
10) inarticulate		
11) anesthesia		
12) atypical		
13) deoxygenate		
14) unable		
15) anoxia		

2. Choose the right negative prefix for each of the words below and write them into the table.

*adsorbed well adequate digested invasive appear
symmetrical patient coherent aligned stable movable
adhesive hydrated sanitary ovular controllable fit existent
uresis agglutinin approve direct palpable pure agree
indication typical active fertile accelerate potent elastic
acid compose perfect symptomatic*

a-	
an-	
anti-	
contra-	
de-	
dis-	
in-	
im-	
non-	
un-	



3.5. OTHER COMMON PREFIXES

Many other common prefixes may also be used to change the meaning of a medical term. For instance, prefixes for colors are used to name cells, conditions, and structures in the body; prefixes for degree carry the meaning of degree or size, etc. (see Table 3.5.1).

Table 3.5.1	Other Common Prefixes <i>This table lists other commonly used prefixes along with their meanings and term analyses.</i>		
	Prefix	Meaning	Term Analysis
Prefixes for Colors*			
	alb-, albin-	white	albin/ism ('albinism): a genetic disorder resulting in minimal or absence of skin, hair, or eye pigmentation. <i>-ism: state; condition; property</i>
	leuk-, leuc-		leuk/o/cyte ('leukocyte): a white blood cell. <i>-cyte: cell</i>
	chlor-	green	chlor/o/phyll ('chlorophyll): the green coloring matter found in leaves and plants. <i>-phyll: leaf</i>
	cyan-	blue	cyan/osis (cya'nosis): bluish discoloration of the skin due to lack of oxygen. <i>-osis: abnormal condition</i>
	erythr-	red	erythr/o/cyte (e'rythrocyte): a red blood cell. <i>-cyte: cell</i>
	melan-	black, dark	melan/oma (mela'noma): a black tumour. <i>-oma: tumour</i>
	xanth-	yellow	xanth/o/cyte ('xanthocyte): a yellow cell. <i>-cyte: cell</i>
Prefixes for Degree			
	hyper-	excessive, above normal	hyper/calc/emia (hypercal'cemia): excessive calcium in the blood. <i>calc: calcium</i> <i>-emia: blood condition</i>
	hyp/o-**	deficient	hyp/ox/emia (hypo'xemia): deficiency of oxygen in the blood. <i>hyp-: under, below, deficient</i> <i>ox: oxygen</i> <i>-emia: blood condition</i>
	olig-	few, scanty	olig/ur/ia (oli'guria): diminished capacity to form and pass urine, resulting in inefficient excretion of the end products of metabolism.

		<i>ur: urine</i> <i>-ia: condition</i>
pan-	all	pan /arthr/itis (panart'hritis): inflammation of all (or many) joints. <i>arthr: joint</i> <i>-itis: inflammation</i>
super-**	excess	super /numer/ary (super'numerary): in excess number. <i>numer: number</i> <i>-ary: pertaining to</i>
Other Common Prefixes		
ante-	before	ante /nat/al (ante'natal): before birth. <i>nat: birth</i> <i>-al: pertaining to</i>
brady-	slow	brady /cardia (brady'cardia): slow heart rate. <i>cardi: heart</i> <i>-ia: condition</i>
tachy-	rapid	tachy /pnea (tachyp'nea): rapid breathing. <i>-pnea: breathing</i>
dys-	bad; painful; difficult	dys /ton/ia (dysto'nia): a neurological disorder marked by strong involuntary muscle spasms that cause painful and disabling twisting of the body. <i>ton: tension</i> <i>-ia: condition</i>
eu-	good, normal	eu /pnea (eup'nea): normal breathing. <i>-pnea: breathing</i>
hetero-	other, different, unequal	hetero /graft ('heterograft): different transplant. <i>-graft: transplantation</i> A heterograft, also called a xenograft, is a transplant of tissue from another species that is used as a temporary graft in certain cases, as in treating a severely burned patient when tissue from the patient or from a tissue bank is not available.
homo-	same, unchanging	homo /graft ('homograft): same transplant. <i>-graft: transplantation</i> A heterograft, also called a xenograft, is a transplant of tissue from another species that is used as a temporary graft in certain cases, as in treating a severely burned patient when tissue from the patient or from a tissue bank is not available.
homeo-		homeo /plasia (homeo'plasia): formation of new tissue similar to that already existing in a part. <i>-plasia: formation, growth</i>
iso-	equal, same	iso /graft ('isograft): a homograft between genetically identical or nearly identical individuals. <i>-graft: transplantation</i>

mal-	bad	mal/nutrition (malnu'trition): bad nutrition. Malnutrition refers to any disorder resulting from an inadequate or excessive intake of food.
mega-***, megal-	large; abnormally large	megal/o/mania (megalo'mania): a psychopathological condition characterized by delusional fantasies of wealth, power, or omnipotence. <i>-mania: state of mental disorder, frenzy</i>
neo-	new	neo/nat/al (neo'natal): of or relating to a newborn infant or to the first 28 days of an infant's life. <i>nat: birth</i> <i>-al: pertaining to</i>
normo-	normal	normo/vol/emia (normovol'emia): a normal volume of blood in the body. <i>vol: volume</i> <i>-emia: blood condition</i>
orth-	straight, correct, upright	orth/o/cephal/ic (orthoce'phalic): having a head well-proportioned to height. <i>cephal-: head</i> <i>-ic: pertaining to</i>
poikilo-	varied; irregular	poikilo/derma (poikilo'derma): any of several disorders characterized by patchy discoloration of the skin. <i>-derma: skin or skin ailment of a (specified) type</i>
pseudo-	false	pseudo/cyesis (pseudocy'esis): false pregnancy. <i>-cyesis: pregnancy</i> Pseudocyesis is a condition in which a woman believes she is pregnant when she is not and begins to develop all the physical characteristics associated with pregnancy.
re-	again; back	re/gurgitation (regurgi'tation): backward or return flow, as of blood or stomach contents. <i>gurgitation: a whirling or surging motion, as of water</i>

*In some sources medical prefixes indicating colors are referred to as word roots. See Appendix B.

**May also show position, as in "hypodermic", "superficial".

***Mega- also means "one million" as in "megahertz".

Exercises (Selecting Other Common Prefixes)

1. Match the following terms with their meanings, and write the appropriate letter to the left of each number. Then identify a prefix in each term.

Term	Meaning of the Term	Prefix
1) ___ melanocyte	a) pertaining to bluish discoloration	
2) ___ xanthoma	b) redness of the skin	

3) ___ cyanotic	c) a person with congenital albinism: white hair and milky skin	
4) ___ erythroderma	d) a cell that produces dark pigment	
5) ___ leukemia	e) a toxic pungent greenish-yellow gas of the halogen group	
6) ___ chlorine	f) overgrowth of white blood cells	
7) ___ albino	g) yellow raised area on the skin	

2. Identify and define the prefix for degree in each of the following terms.

Term	Prefix	Meaning of the Prefix
1) pandemic		
2) hyposecretion		
3) oligospermia		
4) supersaturate		
5) hypertension		

3. Provide a prefix that is opposite in meaning (antonymous) to each of the following listed below.

Prefix	Antonym
1) melan-	
2) tachy-	
3) hyper-	
4) homo-	

4. Place a slash after each of the following prefixes, then define the prefix and explain the meaning of each term. The first one is completed for you.

Term	Prefix	Meaning of the Term
1) hypo/esthesia	<i>hypo-</i>	<i>partial loss of sensation; diminished sensibility</i>
2) bradykinesia		
3) neonate		
4) dyslexia		
5) eupnea		
6) megalopsia		
7) pseudomania		
8) restenosis		

9) homogeneous		
10) antemarital		
11) tachyarrhythmia		
12) poikilocyte		
13) heterophobia		
14) isograft		
15) malunion		
16) orthopedics		
17) dyspepsia		
18) pseudonym		
19) normosmia		
20) tachypnea		

UNIT 3. REVIEW

1. Look at the medical terms given below. Choose medical terms containing prefixes of position and put them in the table. Then identify the prefix in each term and its meaning.

*diplocardia epidermis isograft telangioma
macrobrachia panatrophie dextrocular hemialgia
ipsilateral hypochondriac circumcision endoceliac
revaccination subcutaneous transverse infracerebral
oligochylia mesaortitis deamination homeometric
retroperitoneal contralateral sinistromanual
exocardia*

Terms Containing Prefixes of Position	Prefixes of Position	Meanings of Prefixes
1)		
2)		
3)		
4)		
5)		
6)		
7)		
8)		
9)		
10)		
11)		
12)		

2. Underline prefixes in the following terms, then give the meaning of each term.

- 1) subhepatic
- 2) epigastric
- 3) pericardium
- 4) hyperglycemia
- 5) hypodermic
- 6) anemia
- 7) hypoglycemia
- 8) resection

- 9) prognosis
- 10) diagnosis
- 11) mesonasal
- 12) isogamete
- 13) megalosplenial
- 14) telangiitis
- 15) paracentral
- 16) poikiloblast
- 17) malabsorption
- 18) eusystole
- 19) dyskinesia
- 20) dismemberment

3. Fill in the blanks in the sentences given below.

- 1) A monocular microscope has eyepiece(s).
- 2) To bisect is to cut into parts.
- 3) A quadruped animal has feet.
- 4) Polyadenitis indicates inflammation of lymph node(s).
- 5) A triad has part(s).
- 6) "Semiconscious" means conscious; not completely aware of sensations.
- 7) A unicellular organism is composed of cell(s).
- 8) A diatomic molecule has atom(s).
- 9) Tetraparesis is muscular weakness affecting limb(s).
- 10) A primipara is a woman who is giving birth for the time.
- 11) "Diplogenesi" refers to the production of a fetus that is in part or almost completely.
- 12) A multicasualty incident is a sudden event, resulting in injury or illness in individual(s).

4. Write a term that means the opposite of each of the following.

1) Responsive	
2) Mature	
3) Active	
4) Sufficient	
5) Exotoxin	
6) Macroscopic	
7) Homograft	
8) Hypoactive	
9) Preoperative	
10) Bradyphagia	

5. Write a word that means the same as each of the following using a synonymous prefix.

1) Supersensitivity	
2) Megalocyte (extremely large red blood cell)	
3) Antenatal	
4) Equilateral (having equal sides)	
5) Exogenous	
6) Polycellular	
7) Monoplegia	
8) Quadricuspid	

6. Match the following medical terms with their meanings. Then identify the prefix and the category (type) it belongs to. The first is done for you.

Term	Meaning	Prefix	Prefix Type
1) <i>xanthocyte</i> <i>a</i>	a) <i>a cell with yellow color</i>	<i>xanth-</i>	<i>prefix for color</i>
2) endocrine ____	b) the sharing of derived characters by different species		
3) hyperadenosis ____	c) loss of color in the skin		
4) triceps ____	d) having four chambers, cavities, or spaces		
5) eucholia ____	e) a process of filtering and removing waste products from the bloodstream		
6) perinatal ____	f) a woman who has never been pregnant		
7) aplasia ____	g) having the left eye dominant		
8) leukoderma ____	h) a normal state of the bile as regards quantity and quality		
9) quadrilocular ____	i) a disease of the blood, distinguished by the presence in the blood of black pigment		
10) adducent ____	j) relating to the period shortly before and after birth		
11) hemianosmia ____	k) a muscle having three heads		
12) parasite ____	l) the use of high-frequency sound waves to image internal body structures		
13) nulligravida ____	m) an organism that lives on or in another and draws its nourishment therefrom		
14) immature ____	n) absence of the sense of smell in one nostril		

15) sinistrocular ____	o) enlargement of glands		
16) poikilothermy ____	p) amputation of a limb through a joint, without cutting of bone		
17) melanemia ____	q) congenital absence of one or more fingers or toes		
18) oligodactyly ____	r) bringing toward		
19) dialysis ____	s) not fully grown or developed		
20) disarticulation ____	t) defective development or congenital absence of an organ or tissue		
21) synapomorphy ____	u) secreting internally		
22) ultrasonography ____	v) the ability of organisms to adapt themselves to variations in the temperature of the environment		

CASE STUDIES

CASE STUDY 3.1.: DISPLACED FRACTURE OF THE FEMORAL NECK

While walking home from the train station, E.K., a 76-year-old woman with osteoporosis, tripped over a broken curb and fell. In the emergency department, she was assessed for severe pain, swelling, and bruising of her left thigh. A radiograph showed a displaced left femoral neck fracture. E.K. was prepared for surgery and given a preoperative injection of an analgesic to relieve her pain. Intraoperatively, she was given spinal anesthesia and positioned on an operating room table, with her left hip elevated on a small pillow. Intravenous antibiotics were given before the incision. Her left hip was repaired with a bipolar hemiarthroplasty. Postoperative care included maintaining the left hip in abduction, blood and fluid replacement, physical therapy, and vigilance for development of avascular necrosis and possible dislocation.

CASE STUDY 3.2.: INTERTROCHANTERIC FRACTURE

S.G., age 85, slipped on the wet grass and fell while gardening in his back yard. His neighbor was unable to help him to a standing position and called for an ambulance. S.G. had excruciating pain in his right leg, which was externally rotated, slightly shorter than his left leg, and adducted. Preoperative radiographs showed a non-displaced right intertrochanteric fracture. Intraoperatively, Mr. G. was given spinal anesthesia and positioned on an orthopedic table with his right hip abducted and secured in traction. He had an open reduction and internal fixation with a compression screw and side plate with screws. His postoperative recovery was unremarkable, although he was at risk for deep vein thrombosis, that is, blood clots in his legs. He was discharged to a rehabilitation facility for several weeks of physical therapy and assistance with activities of daily living, such as personal hygiene, dressing, eating, ambulating, and toileting.

CASE STUDY QUESTIONS

1. Write a term from the case histories that means the same as each of the following:

- 1) replacement of half of the joint component _____
- 2) substances that act against microorganisms _____
- 3) in a position away from the midline of the body _____
- 4) position toward the midline of the body _____

2. Identify and define the prefixes in the following terms:

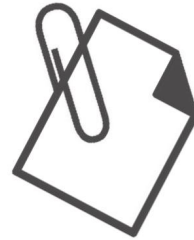
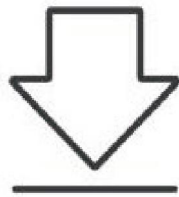
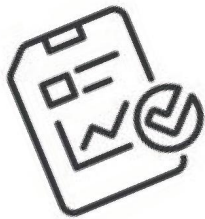
Terms	Prefix	Meaning of the Prefix
5) displace and dislocate		
6) replacement, recovery, and rehabilitation		
7) avascular		
8) anesthesia and analgesic		
9) orthopedic		
10) externally		
11) bipolar		
12) unremarkable		

3. Fill in the blanks:

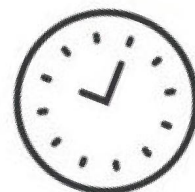
13) The adjective for the operative time span from decision for surgery to placement on the operating room table is _____.

14) The adjective for the operative time span from placement on the operating room table until transfer to postanesthesia recovery unit or intensive care unit is _____.

15) The adjective for the operative time span from admission to postanesthesia is _____.



APPENDICES



APPENDIX A

ALPHABETICAL LIST OF COMMON MEDICAL EPONYMS

Medical Eponym	Description	Named After	Bio
Achilles tendon / Achilles' tendon	a tendon at the back of the lower leg which is the thickest in the human body	Achilles, named in 1693	Greek hero of the Trojan war
Adam's apple	a projection at the front of the neck formed by the thyroid cartilage of the larynx, often prominent in men	Adam	Biblical figure
Addison's disease	a rare chronic condition in which your adrenal glands don't produce enough of the hormones cortisol and aldosterone	Thomas Addison, 1795 – 1860	English physician and medical researcher
Adson forceps / Adson's forceps	a general surgery instrument used for holding dressing materials such as cotton and gauze during surgical procedures and to grasp, hold, and move tissue	Alfred Washington Adson, 1887 – 1951	American physician, military officer, and surgeon
Alzheimer's disease	chronic neurodegenerative disease; most common form of dementia	Alois Alzheimer, 1864 – 1915	Bavarian psychiatrist
Apgar score	summarizes the health of the newborn (appearance, pulse, grimace, activity, respiration)	Virginia Apgar, 1901 – 1974	American obstetrical anesthesiologist
Asperger syndrome / Asperger's syndrome	difficulties in social interaction and nonverbal communication; autism spectrum disorder	Hans Asperger, 1906 – 1980	Austrian pediatrician
Babinski response / Babinski sign	a reflex elicited when the sole of the foot is stimulated with a blunt instrument	Joseph Babinski, 1857 – 1932	French-Polish professor of neurology
Baker cyst / Baker's Cyst	accumulation of joint fluid (synovial fluid) behind the knee	William Morrant Baker, 1839 – 1896	English physician and surgeon

Barrett's esophagus	abnormal change in the lining of the esophagus; may lead to esophageal adenocarcinoma	Norman Rupert Barrett, 1903 – 1979	Australian born thoracic surgeon
Bell palsy	dysfunction of cranial nerve VII, causing facial paralysis	Charles Bell, 1774 – 1842	Scottish surgeon, anatomist, and neurologist
Bowman's capsule / Bowman capsule	a part of the nephron that forms a cup-like sack surrounding the glomerulus	Sir William Bowman, 1 st Baronet, 1816 – 1892	English surgeon, histologist, and anatomist
Braxton Hicks contractions	(a.k.a. practice contractions or false labor) sporadic uterine contractions that may start around six weeks into a pregnancy	John Braxton Hicks, 1823 – 1897	English doctor who specialized in obstetrics
Crohn's disease	inflammatory bowel disease; cobblestone ulceration	Burrill Crohn, 1884 – 1983	American gastroenterologist
Cushing syndrome / Cushing's syndrome / Cushing disease	increased secretion of adrenocorticotrophic hormone (ACTH) from the anterior pituitary (secondary hypercortisolism)	Harvey Cushing, 1869 – 1939	American neurosurgeon, pathologist, writer, and draftsman
Ebola / Ebola virus disease (EVD) / Ebola hemorrhagic fever (EHF)	weakness, hemorrhagic fever, aches, diarrhea, vomiting and stomach pain	Ebola river, in Zaire, first described in 1976	where this virus was first discovered
Eustachian tube	an opening that connects the middle ear with the nasal-sinus cavity	Bartolomeo Eustachio, c. 1500–1510 – 1574	Italian anatomist and one of the founders of the science of human anatomy
Fabry disease / Anderson–Fabry disease	a disorder of lipid metabolism that is inherited as an X-linked recessive trait and is characterized by skin lesions especially on the lower trunk, severe pain in the extremities, corneal opacities, and vascular disease affecting the kidneys, heart, or brain	Johannes Fabry, 1860 – 1930	German dermatologist

Fallopian tube	either of the two tubes in a woman's body along which eggs travel from the ovaries to the womb	Gabriele Falloppio, 1523 – 1562	Italian Catholic priest and anatomist
Glasgow Coma Scale (GCS)	a clinical scale used to reliably measure a person's level of consciousness after a brain injury	Glasgow, in Scotland, the first iteration of the GCS was published in 1974	Bryan Jennett and Graham Teasdale of the University of Glasgow Medical School began work on what became the Glasgow Coma Scale
Gonda's sign	a clinical sign in which flexing and then suddenly releasing the fourth toe elicits an extensor plantar reflex	Viktor Gonda, 1889 – 1959	Ukrainian neuropsychiatrist
Graves' disease	overproduction of thyroid hormones; exophthalmic goiter	Robert Graves, 1796 – 1853	Irish physician
Hodgkin lymphoma / Hodgkin's lymphoma	cancer of the lymphatic tissue	Thomas Hodgkin, 1797 – 1865	British physician
Iris	the colored part around the pupil of the eye that changes in size to control the amount of light entering the pupil	Iris	Greek mythological character, a daughter of the gods Thaumasia and Electra, the personification of the rainbow and messenger of the gods
Korotkoff sounds	sounds that medical personnel listen for when they are taking blood pressure using a non-invasive procedure	Nikolai Korotkov, 1874 – 1920	Russian Empire surgeon, a pioneer of 20 th -century vascular surgery, and the inventor of auscultatory technique for blood pressure measurement
Korsakoff syndrome (KS)	a disorder of the central nervous system characterized by amnesia, deficits in	Sergei Korsakov, 1854 – 1900	neuropsychiatrist from the Russian Empire, known for

	explicit memory, and confabulation		his studies on alcoholic psychosis
Legionnaires' disease	severe form of pneumonia caused by legionella bacterium	American Legion convention (outbreak) in 1976	
Lou Gehrig's disease	amyotrophic lateral sclerosis (ALS); death of neurons in brain and spinal cord; stiff muscles	Lou Gehrig, 1903 – 1941	American baseball player debilitated with ALS
Lyme disease / Lyme borreliosis	infectious bacterial disease; most common disease spread by ticks	Old Lyme, Connecticut, first found in 1975	
Othello syndrome	a psychological disorder in which a person is preoccupied with the thought that their spouse or sexual partner is being unfaithful without having any real proof	Othello	main character of a tragedy "The Tragedy of Othello, the Moor of Venice" written by William Shakespeare
Parkinson's disease	degenerative disease affecting movement, including speech	James Parkinson, 1755 – 1824	English apothecary surgeon
Plyushkin syndrome	(a.k.a. Diogenes syndrome, Havisham syndrome, and Miss Havisham syndrome) a psychological condition in which one has a strong desire to collect, simply put, garbage	Stepan Plyushkin	fictional character in Nikolai Gogol's novel "Dead Souls"
Raynaud syndrome / Raynaud's phenomenon	vasospasms (decrease blood supply to affected regions)	Maurice Raynaud, 1834 – 1881	French physician
Tourette syndrome	a neurodevelopmental disorder that begins in childhood or adolescence and involves repetitive movements or unwanted sounds (tics) that can't be easily controlled	Georges Albert Édouard Brutus Gilles de la Tourette, 1857 – 1904	French physician

Turner syndrome (TS)	a condition that affects only females, results when one of the X chromosomes (sex chromosomes) is missing or partially missing	Henry Hubert Turner, 1892 – 1970	American endocrinologist
West Nile virus	a flavivirus that causes an illness marked by fever, headache, muscle ache, skin rash, and sometimes encephalitis or meningitis and that is spread especially from birds to humans by mosquitoes	Uganda (eastern Africa), first found in 1937	
Whipple procedure	pancreaticoduodenectomy, a major surgical operation most often performed to remove cancerous tumors from the head of the pancreas	Allen Whipple, 1881 – 1963	American surgeon
Whipple disease / Whipple's disease	a multi-system infectious bacterial disease that interferes with the body's ability to metabolize fats	George Hoyt Whipple, 1878 – 1976	American physician, pathologist, biomedical researcher, medical school educator, and administrator
Wilms tumor / Wilms' tumor	malignant kidney tumor containing developing (germ) cells	Max Wilms, 1867 – 1918	German pathologist and surgeon

APPENDIX B

ALPHABETICAL LIST OF COMMON MEDICAL WORD ROOTS & COMBINING FORMS

The following is a list of common medical word roots and combining forms. Although different medical terminology sources may have slightly different lists and slightly different meanings, the following is a fairly inclusive list.

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
abdomin	abdomin/o	abdomen	abdominal distention, abdominocentesis
acanth	acanth/o	thorny, spiny	acanthosis, acantholysis
acetabul	acetabul/o	acetabulum (hip socket)	acetabuloplasty, acetabulectomy
achill	achill/o	Achilles' heel	achillobursitis
acid	acid/o	acid	acidophilic, acidosis
actin	actin/o	ray, radius	Actinomyces, actinic keratosis
acou	acou/o	hearing	acouesthesia, acoustic nerve
acr	acr/o	extremities, height	acrocyanosis, acromegaly
aden	aden/o	gland	adenoma, lymphadenitis
adenoid	adenoid/o	adenoids	adenoidectomy
adren	adren/o	adrenal gland	adrenogenital syndrome, adrenocorticotropin
adrenal	adrenal/o	adrenal gland	adrenalectomy, hyperadrenocorticism
aer	aer/o	air, gas	aerobe, anaerobic, aeroembolism, aerosol
albumin	albumin/o	albumin	hypoalbuminemia, albuminuria
algesi	algesi/o	pain	algesiometer, algesiogenic
alveol	alveol/o	alveolus	alveolitis, alveolar proteinosis
ambly	ambly/o	dull, dim	amblychromasia, amblyopia
amni	amni/o	amnion	diamniotic
amnion	amnion/o	amnion	diamnionic
amyl	amyl/o	starch	amyloidosis, amylase, amylose
an	an/o	anus	anorectal, anoperineal
andr	andr/o	male	androgen, androblastoma
angi	angi/o	vessel	angiography, lymphangitis
anis	anis/o	unequal, dissimilar	anisocoria, anisocytosis
ankyl	ankyl/o	crooked, stiff, bent	ankylosing spondylitis, Ankylostoma
antr	antr/o	antrum	antrectomy, antral
aort	aort/o	aorta	aortography, aortitis
aponeur	aponeur/o	aponeurosis	aponeurotomy
appendic	appendic/o	appendix	appendicitis

arachn	arachn/o	spider	arachnoid, arachnologist, arachnophobia
arche	arche/o	first, beginning	archeocyte, archenteron
arteri	arteri/o	artery	arteriovenous fistula, arteriosclerosis
arteriol	arteriol/o	arteriole (small artery)	arteriolosclerosis
arthr	arthr/o	joint	arthralgia, arthroscope, arthropathy
articul	articul/o	joint	articulation
atel	atel/o	imperfect, incomplete	atelectasis
ather	ather/o	yellowish, fatty plaque	atherosclerosis, atheroma
atri	atri/o	atrium	atrioventricular node
audi	audi/o	hearing	audiology, audiovisual, auditorium
aur	aur/i, aur/o	ear	auricular cartilage, aura, aural
aut	aut/o	self	autoregulation, autoimmune
axill	axill/o	armpit	axillary lymph node
az	az/o	urea, nitrogen	azotemia, azide, diazonium

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
bacteri	bacteri/o	bacteria	bactericidal, bacteriophage
balan	balan/o	glans penis	balanitis, balanic, balonoplasty
bar	bar/o	pressure	barotrauma, barometer
bas	bas/o	base	basophil, basalioma, basolateral
bi	bi/o	life	biopsy, biochemistry, symbiosis
bil	bil/i	bile	biliary tract, hemobilia, bilirubin
blast	blast/o	developing cell	fibroblast, myeloblast, neuroblast
blephar	blephar/o	eyelid	blepharoptosis, blepharoblast
brachi	brachi/o	arm	brachiocephalic, brachial artery
bronch	bronch/i, bronch/o	bronchus	bronchiole, bronchospasm, bronchiectasia
bronchiol	bronchiol/o	bronchiole	bronchiolitis
bucc	bucc/o	cheek	buccal, buccinator, buccula
burs	burs/o	bursa (cavity)	peribursal, bursitis

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
cac	cac/o	bad, ill, diseased	cacosmia, cacophony, cacotrophy
calc	calc/i	calcium	calcification, calcitonin, calcinosis
calcane	calcane/o	heel bone	calcaneodynia

cancer	cancer/o	cancer	cancerization, cancerogenic, cancerous
capn	capn/i	smoke, carbon dioxide	hypercapnia
carcin	carcin/o	cancer	adenocarcinoma, carcinoembryonic antigen
cardi	cardi/o	heart	cardiomyopathy, myocarditis, endocardium
carp	carp/o	carpals (wrist bones)	carpectomy, carpal tunnel syndrome
caud	caud/o	tail, toward the lower part of the body	caudal, caudate nucleus, caudad
caus	caus/o	heat	causalgia
cec	cec/o	cecum	cecostomy, cecoptosis, cecal
centr	centr/i, centr/o	center	centrilobular, centriole, centroacinar cell, centrokinesia
celi	celi/o	abdomen	celiac artery, celiocentesis
cephal	cephal/o	head	encephalopathy, microcephaly, cephalic
cerebell	cerebell/o	cerebellum	supracerebellar, olivopontocerebellar atrophy
cerebr	cerebr/o	cerebrum, brain	cerebrospinal fluid, cerebroside
cerumin	cerumin/o	cerumen (earwax)	ceruminolysis, ceruminoma, ceruminosis
cervic	cervic/o	cervix	cervicofacial, cervicitis, endocervical
cheil	cheil/o	lip	cheiloplasty, cheilitis
chem	chem/o	chemical	chemotherapy
chir	chir/o	hand	chirospasm, chiropodalgia
cholangi	cholangi/o	bile duct	cholangitis, cholangiocellular carcinoma
chol	chol/e	gall, bile	cholesterol, cholestasis, choline
choledoch	choledoch/o	common bile duct	choledocholith, choledochostomy
chondr	chondr/o	cartilage	chondrosarcoma, chondroitin sulfate
chori	chori/o	chorion	choriocarcinoma, human chorionic gonadotropin
chrom	chrom/o	color	chromogen, chromosome, chromaffin cell
chromat	chromat/o	color	chromatin, chromatography
chron	chron/o	time	synchronous, chronological
cine	cine/o	motion	cineradiography, cineplastics
cinemat	cinemat/o	motion	cinematography
cirrh	cirrh/o	yellow, tawny	cirrhosis, cirrhogenous
clavic	clavic/o	clavicle (collar bone)	clavicotomy

clavicul	clavicul/o	clavicle (collar bone)	claviculectomy
cleid	cleid/o	clavicle	cleidorrhesis, cleidotomy, cleidocranial dysostosis
coagul	coagul/o	clot	coagulopathy, coagulator, coagulation time
coccidiod	coccidiod/o	fungus	coccidioidomycosis
cochle	cochle/o	snail	cochleotopic, cochleovestibular, cochlear implant
col	col/o	colon	colostomy, colorectal, colitis
colp	colp/o	vagina	colposcopy, colpospasm, colpitis
condyl	condyl/o	knuckle	condyloma, condyloid
coni	coni/o	dust	pneumoconiosis, coniphage
conjunctiv	conjunctiv/o	conjunctiva	conjunctivitis
copr	copr/o	feces, excrement	coprosthesis, coproscopy, coprophobia
cord	cord/o	cord	cordotomy, cordocentesis
core	core/o	pupil	corectomy, corectasis, coreometer, coreoplasty
corne	corne/o	cornea	corneal, corneosclera, cornealiritis
coron	coron/o	heart	coronary artery
cortic	cortic/o	cortex (outer layer of body organ)	corticospinal tract, corticosteroid cortical
cost	cost/o	rib	costopneumopexy, costophrenic angle
cox	cox/o	hip	coxalgia, coxodynia
crani	crani/o	cranium(skull)	cranial nerve, craniotomy
crin	crin/o	secrete	endocrinology, exocrine gland
cry	cry/o	cold	cryosurgery, cryoglobulin
crypt	crypt/o	hidden	cryptorchism, cryptococcosis, cryptic
culd	culd/o	cul-de-sac	culdocentesis, culdoscope
cutane	cutane/o	skin	cutaneous lymphoma, cutaneomucosal
cyan	cyan/o	blue	cyanosis, hemocyanin, cyanocobalamin
cycl	cycl/o	ciliary body	cycloplegia
cyes	cyes/i, cyes/o	pregnancy	cyesis, cyesoedema
cyst	cyst/o	bladder, sac	cystostomy, cholecystitis, cystadenoma
cyt	cyt/o	cell	cytology, cytotoxic, thrombocytopenia

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
dacry	dacry/o	tear, tear duct	dacryostenosis, dacryon
dactyl	dactyl/o	fingers or toes	polydactyly, arachnoidactylia
dendr	dendr/o	tree, resembling a tree	dendrites, dendrology, dendrite
dent	dent/i	tooth	dentist, denture, dentate, dentine
derm	derm/o	skin	epidermal, dermoid cyst
dermat	dermat/o	skin	dermatology, dermatitis, dermatomyositis
dextr	dextr/o	right	dextrocardia, dextrose
diaphor	diaphor/o	sweat	diaphoresis, diaphorase
diaphragmat	diaphragmat/o	diaphragm	diaphragmatocele
didym	didym/o	testis	didymalgia, didymitis
dilat	dilat/o	widen	dilation, dilator muscle
dipl	dipl/o	two, double	diplopia, diploid, diplobacterium
dips	dips/o	thirst	dipsomania, dipsia, dipsotherapy
disk	disk/o	disk	discectomy, diskogenic pain
diverticul	diverticul/o	diverticulum	diverticulitis, diverticulosis
dont	dont/o	tooth	oligodontia
dors	dors/i, dors/o	back (of the body)	dorsolateral, dorsiflexion
duoden	duoden/o	duodenum	duodenectomy, duodenitis
dur	dur/o	hard, dura mater	duroarachnoiditis, subdural hematoma
dynam	dynam/o	motion	hemodynamics, dynamism

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
ech	ech/o	sound	echography, hypoechoic
ectop	ectop/o	located away from usual place	ectopic tissue, ectopism
electr	electr/o	electricity, electrical	electroencephalography, electrophoresis activity
embol	embolo	embolus	embolism
embry	embry/o	embryo, to be full	embryology, embryonic, polyembryoma
emmetr	emmetr/o	a normal measure	emmetropia
encephal	encephal/o	brain	anencephaly, encephalomalacia
endocrin	endocrin/o	endocrine	endocrinology, endocrinopathy
enter	enter/o	intestines	Enterococcus, gastroenterology
epididym	epididym/o	epididymis	epididymitis, epididymovasectomy
epiglott	epiglott/o	epiglottis	epiglottitis

episi	episi/o	vulva	episioplasty, episiotomy
epitheli	epitheli/o	epithelium	epithelioid cell, epithelioma
erythr	erythr/o	red	erythrocyte, erythremia, erythropoietin
esophag	esophag/o	esophagus	esophagitis, esophagojejunostomy
esthesi	esthesi/o	sensation, sensitivity, feeling	esthesioneuroblastoma
eti	eti/o	cause (of disease)	etiology, etiotropic

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
faci	faci/o	face	facioplasty, facioplastia, facial palsy
fasci	fasci/o	fascia (membrane supporting muscles)	fasciosis, fasciorrhaphy, fascioplasty
femor	femor/o	femur (upper leg bone)	femoral artery, femorotibial
ferr	ferr/i, ferr/o	iron	ferric, transferrin, ferrocyanide
fet	fet/i, fet/o	fetus, unborn child	fetoplacental relation, alpha-fetoprotein, fetiparous
fibr	fibr/o	fibrous tissue, fibers	fibrosis, fibroblast, fibril
fibul	fibul/o	fibula (lower leg bone)	fibulocalcaneal
foramin	foramin/o	foramen, opening	foraminotomy, foraminal herniation

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
galact	galact/o	milk	galactose, agalactia, galactorrhea
gangli	gangli/o	ganglion	ganglioneuroma, paraganglioma
ganglion	ganglion/o	ganglion	aganglionosis, ganglionic
gastr	gastr/o	stomach	gastritis, epigastric, epigastralgia
gen	gen/o	origin, formation	organogenesis, carcinogenesis, gene
ger	ger/o	old age, aged	progeria, geromorphism
geront	geront/o	old age, aged	gerontology, gerontopia
gigant	gigant/o	giant	gigantism, gigantoblast, gigantomastia
gingiv	gingiv/o	gum	gingivectomy, gingivitis
glandul	glandul/o	gland	glandular
gli	gli/o	neuroglia	glioma, oligodendroglia, gliosis
glomerul	glomerul/o	glomerulus	glomerulonephritis, glomerulosclerosis

gloss	gloss/o	tongue	glossitis, macroglossia, glossopharyngeal
glyc	glyc/o	sugar	hypoglycemia, glycogen, triglyceride
glycos	glycos/o	sugar	glycosuria, glycoside, glycosylation
gluc	gluc/o	sweetness, sugar	glucocorticoid, glucose, glucuronic acid
gnath	gnath/o	jaw	prognathous, epignathus, Gnathostoma
gnos	gnos/o	knowledge	gnosis, gnosis
gon	gon/o	seed, knee	gonalgia, Gonococcus
gonad	gonad/o	ovaries, testes	gonad, gonadal cord, gonadopathy, gonadotrophic hormones
gravid	gravid/o	pregnancy	gravida, multigravida
gyn	gyn/o	woman	gynogamete
gynec	gynec/o	woman	gynecology, gynecomastia

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
hem	hem/o	blood	hemorrhage, hemophilia, hemorrhoid
hemat	hemat/o	blood	hematology, hematocrit, hematopoiesis
hepat	hepat/o	liver	hepatocyte, hepatitis, hepatology
herni	herni/o	hernia	herniotomy, herniation, hernioplasty
heter	heter/o	other	heterogenous, heterozygote, heterotopia
hidr	hidr/o	sweat	hidradenoma, hidradenitis
hirsur	hirsut/o	hair, hairy	hirsutism
hist	hist/o	tissue	histology, histoplasmosis, histamine
home	home/o	sameness, unchanging	homeostasis, homeothermia
hom	hom/o	same	homosexual, homologous, homogeneous
humer	humer/o	humerus (upper arm bone)	humeroscapular
hydr	hydr/o	water	dehydration, hydrops fetalis, hydrostatic
hymen	hymen/o	hymen	hymenal, hymenorrhaphy
hypn	hypn/o	sleep	hypnosis, hypnotherapy, hypnotism
hyster	hyster/o	uterus	hysterectomy, hysterics

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
ichthy	ichthy/o	fish	ichthyosis, ichthyoid
ile	ile/o	ileum	ileitis, ileocecal valve
ili	ili/o	ilium	iliopelvic, iliac artery
immun	immun/o	immune	immunostaining, immunization, immunity
insul	insul/o	pancreatic islets	insuloma
insulin	insulin/o	insulin	insulinogenic, insulinoid
ion	ion/o	ion	ionoradioscope
irid	irid/o	iris	iridoschisis, iridocyclitis
iri	iri/o	iris	iritis
is	is/o	equal, same	isotope, isozyme, anisocoria
ischi	ischi/o	ischium	ischiatric nerve, ischiopubic
isch	isch/o	deficiency, blockage	ischophonia, ischemia, ischuria

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
jejun	jejun/o	jejunum	jejunoileal, jejunitis

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
kal	kal/i	potassium	hyperkalemia, hypokalemia
kary	kary/o	nucleus	megakaryocyte, karyorrhexis, karyotype
kerat	kerat/o	cornea	keratoplasty, keratoconjunctivitis
kerat	kerat/o	horny tissue, hard	keratosis, keratinization
kin	kin/e	movement	kinetics, kinetoplast, kinetochore
kinesi	kinesi/o	movement, motion	kinesis, akinesia
kinet	kinet/o	motion	kinetosis
kyph	kyph/o	hump	kyphosis, kyphorachitis

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
labi	labi/o	lips	labiodental, labiomancy, labiate
labyrinth	labyrinth/o	labyrinth	labyrinthitis, labyrinthine, reflex
lacrim	lacrim/o	tear duct, tear	nasolacrimal, lacrimation
lact	lact/o	milk	lactogenic, lactose, lactoferrin
lamin	lamin/o	lamina (thin, flat plate or layer)	laminectomy, laminin
lapar	lapar/o	abdomen	laparotomy, laparoscope
laryng	laryng/o	larynx	laryngoscope, laryngectomy
later	later/o	side	ipsilateral, unilateral
lei	lei/o	smooth	leiomyoma, leiotrichous

leuk	leuk/o	white	leukocyte, leukemia, leukoplakia
lingu	lingu/o	tongue	lingual, linguistic
lip	lip/o	fat	lipoid, lipoprotein, liposarcoma
lith	lith/o	stone, calculus	lithiasis, phlebolith, lithotomy
lob	lob/o	lobe	lobotomy, lobectomy, lobar, lobule
lumb	lumb/o	lumber region, lower back	lumbago, thoracolumbar, lumbosacral
lymph	lymph/o	lymph	lymphoma, lymphoblast, lymphangictasia

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
macr	macr/o	abnormal largeness	macroglobulin, macroscopic, macrohematuria
mamm	mamm/o	breast	mammography, mammalian, mamillary body
mandibul	mandibul/o	mandible (upper jawbone)	mandibulectomy, mandibulofacial
mast	mast/o	breast	mastectomy, mastitis, mastopathy
mastoid	mastoid/o	mastoid	mastoidectomy, mastoiditis
maxill	maxill/o	maxilla (lower jawbone)	maxillectomy, maxillotomy
meat	meat/o	meatus (opening)	meatal, meatoscope
melan	melan/o	black	melanoma, melanin, melanosis
men	men/o	menstruation	amenorrhea, menopause, menarche
mening	mening/i, mening/o	meninges	meningioma, meningocele
menisc	menisc/o	meniscus (crescent)	meniscocyte (=sickle cell)
ment	ment/o	mind	mentality, dementia
ment	ment/o	chin	mentohyoid, mentolabial
metr	metr/i, metr/o	uterus	metrorrhagia, endometriosis, pyometra
micr	micr/o	small	microscope, microdissection
mon	mon/o	one	monoclonal, monocyte, monochrome
morph	morph/o	form, shape	morphology, metamorphosis, monomorphic
muc	muc/o	mucus, mucous membrane	mucosa, mucin, mucopolysaccharide
my	my/o	muscle	myoma, myalgia, amyotrophic lateral sclerosis
myc	myc/o	fungus	mycosis, mycobacterium, mycotic embolism

myel	myel/o	bone marrow	myelofibrosis, myelogenous, myeloma
myel	myel/o	spinal cord	myelitis, myelogram, myeloma
myelon	myelon/o	spinal cord	myelonic
myring	myring/o	eardrum	myringotome, myringorupture
myx	myx/o	mucus	myxoma, myxoid matrix, paramyxovirus

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
nan	nan/o	dwarf	nanomelia, nanogram, nanophthalmia
narc	narc/o	stupor	narcosis, narcolepsy, narcotism
nas	nas/o	nose	paranasal, nasopharynx, nasolabial fold
nat	nat/o	birth	neonate, natality, prenatal diagnosis
necr	necr/o	death (of cell, body)	necrosis, necrotizing angitis, necropsy
nephr	nephr/o	kidney	nephron, nephropathy, nephrosclerosis
neur	neur/o	nerve	neurosis, neuralgia, neuroblastoma
neutr	neutr/o	neither (neutral)	neutron, neutrophilia, neutralize
noct	noct/i	night	nocturnal, nocturia, noctambulation
nyct	nyct/o	night	nyctophobia, nyctophosia
nyctal	nyctal/o	night	nyctalopia, nyctalopia

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
ocul	ocul/o	eye	oculomotor nerve, ocular, oculogyrator
odont	odont/o	tooth	odontalgia, odontogenic tumor
olecran	olecran/o	olecranon (elbow)	olecranal
olig	olig/o	scanty, few	oliguria, oligodendrocyte, oligosaccharide
oment	oment/o	omentum	omentectomy, omentorrhaphy, omentosplenopexy
omphal	omphal/o	umbilicus, navel	omphalocele, omphalophlebitis
onc	onc/o	tumor	oncogene, oncologist, oncocyte
onych	onych/o	nail	melanoonychia, onychophagia, pachyonychia
o	o/o	egg, ovum	oogenesis, oocyte, oocyst
oophor	oophor/o	ovary	oophorectomy, oophoritis
ophthalm	ophthalm/o	eye	ophthalmology, ophthalmoscope

opt	opt/o	vision	optometer, optician
orchi	orchi/o	testis, testicle	orchiectomy, orchiopexy, orchitis
orchid	orchid/o	testis, testicle	orchidoepididymectomy
organ	organ/o	organ	organogenesis, microorganism
or	or/o	mouth	oropharynx, oral, orolingual
orth	orth/o	straight	orthopnea, orthopedics, orthostatic
osm	osm/o	smell	anosmia
oste	oste/o	bone	osteoporosis, endosteum, osteosarcoma
ot	ot/o	ear	otoplasty, otorhinopharyngology
ov	ov/i, ov/o	egg	ovulation, ovotestis, ovoid, oval, oviduct
ox	ox/i, ox/o	oxygen	oxidant, peroxidation, dioxide
oxy	oxy/o	oxygen	oxytoxin

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
pachy	pachy/o	thick	pachymeningitis, pachyderma
palat	palat/o	palate	palatine, palatoschisis
pancreat	pancreat/o	pancreas	pancreatobiliary, pancreatitis
papill	papill/o	nipple	papillary, papilloma, papillotubular
parathyroid	parathyroid/o	parathyroid gland	parathyroidectomy, hypoparathyroidism
par	par/o	bear, give birth to, labor	parity, viviparity
part	part/o	bear, give birth to, labor	postpartum
parthen	parthen/o	virgin	parthenogenesis, parthenophobia
patell	patell/o	patella (knee cap)	patellectomy
path	path/o	disease	pathology, pathogenesis, pathogen
pector	pector/o	chest	pectoral muscle, pectoriloquy
ped	ped/o	child, foot	pediatrics, pedal, pedestrian
pelv	pelv/i, pelv/o	pelvis, pelvic bone	pelvimetry, pelviolithotomy
pept	pept/o	digestion	peptide, peptone, Peptococcus
perine	perine/o	perineum	perineal, perineotomy
peritone	peritone/o	peritoneum	peritoneal, retroperitoneum
petr	petr/o	stone	osteopetrosis, petroleum
phac, phak	phac/o, phak/o	lens of the eye	phacolysis, phacomatosis, phacomalacia

phag	phag/o	eat, swallow	phagocytosis, macrophage, erythrophagia
phalang	phalang/o	phalange (finger or toe bone)	phalangeal joint, metaphalanx
pharyng	pharyng/o	pharynx	pharyngeal, nasopharyngitis
phas	phas/o	speech	aphasia, dysphasia
phe	phe/o	brown	pheochromocytoma, pheomelanin
phleb	phleb/o	vein	phlebectasis, phlebitis, phlebolith
phot	phot/o	light	photosensitivity, photon
phren	phren/o	mind	schizophrenia, phrenopathy
physi	physi/o	nature	physiology, physiologist, physical
plasm	plasm/o	plasma	neoplasm, cytoplasmic, plasminogen
pleur	pleur/o	pleura	pleuritis, pleurisy, pleuralgia
pneumat	pneumat/o	lung, air	pneumatosis
pneum, pneumon	pneum/o, pneumon/o	lung, air	pneumectomy, pneumonitis, pneumothorax
pod	pod/o	foot	podocyte, anthropod
poikil	poikil/o	varied, irregular	poikilocytosis, poikiloderma
poli	poli/o	gray matter	poliomyelitis, poliovirus
polyp	polyp/o	polyp, small growth	polypectomy, polypoid
porphyr	porphyr/o	purple	porphyrin, porphyria
poster	poster/o	back (of body)	posterolateral
prim	prim/i	first	primigravida, primordium
proct	proct/o	rectum	proctology, proctitis, proctoscope
prostat	prostat/o	prostate gland	prostatic acid phosphatase, prostatitis
prote	prote/o	protein	proteolysis, protease, proteoglycan
pseud	pseud/o	false	pseudopolypoid, pseudocyst, Pseudomonas
psych	psych/o	mind	psychotherapy, psychology
pub	pub/o	pubis	pubococcygeal, pubic
puerper	puerper/o	childbirth	puerperium, puerperal period
pulmon	pulmon/o	lung	pulmonary artery, pulmonic
pupill	pupill/o	pupil	pupillotomy
py	py/o	pus	pyogenic, pyoderma, pyosalpinx
pyel	pyel/o	renal pelvis	pyelogram, pyelonephritis
pylor	pylor/o	pylorus (pyloric sphincter)	pylorospasm, pyloroplasty

pyr	pyr/o	fever, heat	pyrogen, pyrophosphate, pyroglobulin
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WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
quadr	quadr/i	four	quadrant, quadriceps muscle

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
rachi	rachi/o	vertebra, spinal or vertebral column	rachischisis, rachiocentesis, rachiomylitis
radi	radi/o	radius (lower arm bone)	radiocarpal
radic	radic/o	nerve root	radicle, radicotomy
radicul	radicul/o	nerve root	radiculitis, myeloradiculopathy
rect	rect/o	rectum	rectocele, rectoscopy
ren	ren/o	kidney	adrenal, renin, renovascular hypertension
reticul	reticul/o	network	reticular, reticulocyte, reticulosis
retin	retin/o	retina	retinopathy, retinoblastoma
rhabd	rhabd/o	rod-shaped, striated	rhabdomyosarcoma, Rhabditis
rhin	rhin/o	nose	rhinorrhea, rhinitis, rhinoscheroma
rhythm	rhythm/o	rhythm	arrhythmia
rhytid	rhytid/o	wrinkles	rhytidoplasty

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
sacr	sacr/o	sacrum	sacrodynia
salping	salping/o	fallopian (uterine) tube	salpingotomy, salpingitis
sarc	sarc/o	flesh, connective tissue	sarcoma, sarcoplasmic reticulum
scapul	scapul/o	scapula (shoulder bone)	scapulectomy
schiz	schiz/o	split	schizophrenia
scler	scler/o	sclera, hard	arteriosclerosis, episclera, sclerotherapy
scoli	scoli/o	crooked, curved	scoliosis, scoliometer
scot	scot/o	dark, darkness	scotoma
seb	seb/o	sebum (oil)	seborrhea, sebaceous gland
ser	ser/o	serum	serology
sial	sial/o	saliva	sialolith, sialadenitis, sialic acid
sider	sider/o	iron	siderophages, hemosiderosis, sideroblast
sigmoid	sigmoid/o	sigmoid	sigmoidoscope, sigmoidectomy
sinister	sinister/o	left	sinistrad, sinisterous

sin, sinus	sin/o, sinus/o	sinus	sinoatrial node, sinusoid
somat	somat/o	body	somatostatin, somatic mutation
somn	somn/i, somn/o	sleep	somnolence
son	son/o	sound	ultrasonic, sonicator
spermat	spermat/o	spermatozoan, sperm	spermatogonia, spermatocoele
sperm	sperm/o	spermatozoan, sperm	spermine
sphygm	sphygm/o	pulse	sphygmomanometer
spir	spir/o	breathe, breathing	spirometer, spirometry
splen	splen/o	spleen	asplenia, polysplenia, splenomegaly
spondyl	spondyl/o	vertebra, spinal or vertebral column	spondylolysis, spondylitis
staped	staped/o	stapes (middle ear bone)	stapedial
staphyl	staphyl/o	grape-like clusters	Staphylococcus
steat	steat/o	fatty	steatorrhea, steatocystoma
stern	stern/o	sternum (breastbone)	sternocleidomastoid muscle
steth	steth/o	chest	stethoscope, stethomyositis
stomat	stomat/o	mouth	stomatitis, stomatodysodia
strept	strept/o	twisted chains	Streptobacillus, streptolysin
synovi	synovi/o	synovia, synovial membrane	synovitis, synovioma
system	system/o	system	systematic, systematology

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
tars	tars/o	tarsals (ankle bones)	tarsotomy, metatarsal
tars	tars/o	edge of eyelid, tarsal (instep of foot)	tarsitis, tarsoorbital
ten	ten/o	tendon	tenoplasty
tendin	tendin/o	tendon	tendinous, tendinitis
tend	tend/o	tendon	tendosynovitis
terat	terat/o	malformed fetus	teratoma, teratogenesis
test	test/o	testis, testicle	testicular, testosterone
than	than/o	death	euthanasia
thel	thel/o	nipple	thelorrhagia
therm	therm/o	heat	hypothermia, thermometer, thermotherapy
thorac	thorac/o	thorax (cheat)	thoracic duct, thoracolumbar spine
thromb	thromb/o	clot	thrombolysis, thromboembolism, thrombin
thym	thym/o	thymus gland	thymectomy, thymoma, thymosin

thyroid	thyroid/o	thyroid gland	thyroidectomy, thyroiditis, hyperthyroidism
thyr	thyr/o	thyroid gland	thyroglossal duct, thyroglobulin
tibi	tibi/o	tibia (lower leg bone)	tibioperoneal
toc	toc/o	labor	eutocia, tocus, tocopherol
tom	tom/o	cut, section	tomography, tomotocia
ton	ton/o	tension, pressure	atonic, tonofilament, hypertonic
tonsill	tonsill/o	tonsils	tonsillitis, tonsillectomy
top	top/o	place	ectopia, topography, topology
toxic	toxic/o	poison	toxicology, toxicosis, toxicoderma
trache	trache/o	trachea	tracheostomy, tracheobronchitis
trachel	trachel/o	neck, necklike	trachelectomy, trachelocyllosis
traumat	traumat/o	wound, injury	traumatology
trich	trich/o	hair	Trichomonas, Trichophyton, trichilemmal
tympan	tympan/o	eardrum, middle ear	tympanometry, tympanoplasty

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
uln	uln/o	ulna (lower arm bone)	ulnocarpal, ulnar deviation
ungu	ungu/o	nail	ungual, unguligradation
ur	ur/o	urine, urinary tract	urology, urobilinogen, uremia
ureter	ureter/o	ureter	hydroureter, ureterscope
urethr	urethr/o	urethra	urethroscope, urethritis
urin	urin/o	urine, urinary tract	urinometry, urinalysis, uriniferous
urinat	urinat/o	urination	urination
uter	uter/o	uterus	intrauterine, uterovaginal
uvul	uvul/o	uvula	uvulitis, uvulectomy

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
vag	vag/o	vagus nerve	vagotomy
vagin	vagin/o	vagina	vaginitis, bacterial vaginosis
valvul	valvul/o	valve	valvuloplasty
varic	varic/o	twisted vein	varicocele, varicose
vas	vas/o	vessel, duct	vasodilation, vasotomy, vasa vasorum
vascul	vascul/o	small vessel	vasculopathy, vasculomotor
ven	ven/o, ven/i	vein	venous, venoocclusive disease, venisuture

vener	vener/o	desire, love (sexual intercourse)	venereal disease
ventricul	ventricul/o	ventricle	ventriculitis, intraventricular
verd	verd/o	green	biliverdin, verdohemoglobin
vertebr	vertebr/o	vertebra, spinal or vertebral column	paravertebral, invertebrate
vesic	vesic/o	bladder, sac	vesical, vesicoureteral, vesicle
vesicul	vesicul/o	seminal vesicles	vesiculogram, vesiculitis
vir	vir/o	virus	viremia, virology, viruria, virocyte
viril	viril/o	masculine	virilism, virile
viscer	viscer/o	internal organs	visceral, viscerology
vulv	vulv/o	vulva	vulvar, vulvovaginitis

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
xanth	xanth/o	yellow	xanthoma, xanthochromia xanthogranuloma
xen	xen/o	alien, foreign	xenophobia
xer	xer/o	dry	xeroderma, xerosis
xiph	xiph/o	straight sword, sword-shaped	xiphoid

WORD ROOT	COMBINING FORM	DEFINITION	EXAMPLE
zo	zo/o	animal	zoology
zon	zon/o	encircling area	zonesthesia
zyg	zyg/o	joined	zygodactyly

APPENDIX C

ALPHABETICAL LIST OF COMMON MEDICAL SUFFIXES

The following is a list of common medical suffixes. Although different medical terminology sources may have slightly different lists and slightly different meanings, the following is a fairly inclusive list.

SUFFIX	DEFINITION	EXAMPLE
-ac	pertaining to	cardiac, celiac, ileac
-agra	excessive pain	clidagra, celiagra, melagra, pellagra
-al	pertaining to	skeletal, bronchial, psychological
-algia	pain	myalgia, gastralgia, gonalgia, arthralgia
-apheresis	removal	plasmapheresis
-ar	pertaining to	muscular, ocular, molar, hilar
-ary	pertaining to	urinary, pulmonary
-ase	enzyme	lipase, elastase, peroxidase, amylase
-asthenia	weakness	myasthenia gravis, thrombasthenia
-atresia	absence of a normal body opening, occlusion, closure	duodenal atresia

SUFFIX	DEFINITION	EXAMPLE
-capnia	pertaining to carbon dioxide	hypercapnia, hypocapnia
-cele	hernia, protrusion	cystocele, meningocele, mucocele
-centesis	surgical puncture to aspirate fluid	celiocentesis, thoracocentesis
-cidal, -cide	killing, destroying	bactericidal, suicide, suicidal
-clasia	break	osteoclasia
-clasis	break	karyoclasia
-cle	little	article, particle
-clysis	irrigating, washing	enteroclysis
-coccus (pl. cocci)	berry shaped (a form of bacterium)	Streptococcus, Enterococcus
-crit	to separate	hematocrit
-cule	little	animalcule
-cyte	cell	thrombocyte, oocyte, keratinocyte

SUFFIX	DEFINITION	EXAMPLE
-desis	surgical fixation, fusion, binding	arthrodesis, pleurodesis
-dipsia	(condition of) thirst	hyroadipsia, oligodipsia
-drome	run, running	syndrome, palindrome
-dynia	pain	cephalodynia, coccydynia

SUFFIX	DEFINITION	EXAMPLE
-eal	pertaining to	esophageal, pharyngeal, coccygeal

-ectasia, -ectasis	stretching out, dilatation, expansion	bronchiectasis, lymphangiectasis, telangiectasis/telangiectasia
-ectomy	excision or surgical removal	tonsillectomy, splenectomy, gastrectomy
-ectopia	displacement	ectopia
-emesis	vomiting	hematemesis, emesis
-emia	blood condition	hyperemia, hypokalemia, leukemia, anemia
-er	one who	killer, helper, inducer
-esis	condition	amniocentesis, diaphoresis

SUFFIX	DEFINITION	EXAMPLE
-form	resembling	cerebriform, fusiform, storiform, plexiform

SUFFIX	DEFINITION	EXAMPLE
-gen	substance or agent that produces or causes	allergen, pathogen, glycogen, pyrogen oxygen, nitrogen, fibrinogen
-genesis	origin, cause	cytogenesis, pathogenesis
-genic	producing, originating, causing	pathogenic, iatrogenic, cardiogenic
-gnosis	knowledge	diagnosis, prognosis
-gram	record, X-ray film	sonogram, encephalogram, air bronchogram
-graph	instrument used to record	spiograph, micrograph
-graphy	process of recording, X-ray filming	roentgenography, radiography

SUFFIX	DEFINITION	EXAMPLE
-ia	condition of diseased or abnormal state	insomnia, anemia, pneumonia, hyperplasia
-ial	pertaining to	axial, myocardial, facial
-iasis	abnormal condition (produced by something specific)	amebiasis, elephantiasis, nephrolithiasis
-iatry	medicine, treatment	psychiatry
-ic	pertaining to	pelvic, hyperplastic, gastric, toxic
-ician	specialist, one who	clinician, physician, technician
-icle	small, minute	ventricle
-ics	organized knowledge, treatment	obstetrics
-ictal	seizure, attack	postictal, preictal
-ine	pertaining to	feminine, masculine
-ism	state of, condition	hirsutism, anabolism, hyperthyroidism
-ismus	spasm, contraction	vaginismus, vulvismus
-ist	specialist	dentist

-ite	the nature of, resembling	dendrite
-itis	inflammation	esophagitis, gastritis, colitis, osteitis
-ium	structure, tissue	endoneurium, pericardium

SUFFIX	DEFINITION	EXAMPLE
-lalia	speech, bubble	echolalia
-lepsy	seizure	narcolepsy, epilepsy
-let	little	tumorlet, ringlet, doublet, triplet
-logist	one who studies and practices (specialist)	oncologist, pathologist
-logy	study of	cardiology, hematology, urology
-lysis	loosing, dissolution, separating	hemolysis, rhabdomyolysis, analysis

SUFFIX	DEFINITION	EXAMPLE
-malacia	softening	osteomalacia, encephalomalacia
-mania	madness, insane desire	maniac, onomatomania
-megaly	enlargement	hepatomegaly, cardiomegaly, splenomegaly
-meter	instrumental used to measure	ergometer, thermometer, parameter
-metry	process of measuring	spirometry, morphometry
-morphic	form, shape	monomorphic, pleomorphic, polymorphic

SUFFIX	DEFINITION	EXAMPLE
-odia	smell	polypodia, sympodia
-(o)dynia	pain	cardiodynia, gastrodynia
-oid	resembling	mucoid, osteoid, amyloid, adenoid, lipoid
-ole	small, minute	arteriole
-(o)logist	one who studies and practices (specialist)	physiologist, pathologist, cytologist
-(o)logy	study of	physiology, radiology, pathology
-oma (singular), -omata (plural)	tumor, swelling	osteoma, teratoma, hepatoma, carcinoma
-opia	vision (condition)	diplopia, gerontopia, nyctalopia
-opsy	examination or inspection	biopsy, necropsy, autopsy
-or	one who	doctor
-(o)rrhage, -(o)rrhagia,	rapid flow of blood, bursting	hemorrhage, lymphorrhage, metrorrhagia
-(o)rrhaphy	suturing, repairing	cystorrhaphy, hymenorrhaphy, neurorrhaphy
-(o)rrhea (AmE)	flow, discharge	amenorrhea, galactorrhea
-(o)rrhoea (BrE)	flow, discharge	amenorrhoea, galactorrhoea

- (o)rrhexis	rupture	karyorrhexis, enterorrhexis
-osis	abnormal condition (means increased when used with blood cell word roots)	neurosis, diverticulosis, alkalosis leucocytosis, erythrocytosis
-(o)stomy	creation of an artificial opening	cholecystostomy, colostomy, tracheostomy, gastrostomy
-ous	pertaining to	venous, mucous, cutaneous, ferrous
-oxia	pertaining to oxygen	hypoxia, anoxia, asphyxia

SUFFIX	DEFINITION	EXAMPLE
-pagus	conjoined twins, with the first part denoting the organs fused	xiphopagus
-paresis	slight paralysis	hemiparesis
-pathy	disease	encephalopathy, neuropathy, mastopathy
-penia	abnormal reduction in number, deficiency	leukopenia, thrombocytopenia, lymphopenia, osteopenia
-pepsia	digestion	dyspepsia, apepsia
-pexy	surgical fixation, suspension	uteropexy, nephropexy
-phagia	eating, swallowing	dysphagia, erythrophagia
-phasia	speech	aphasia
-phil	cells with staining reactions	neutrophil, basophil, acidophil, oxyphil
-philia	love, attraction for	eosinophilia, hemophilia
-philic	attracting, absorbing	hydrophilic, neutrophilic, basophilic
-phobia	abnormal fear of or aversion to specific, objects or things	chromophobia, phobophobia, hydrophobia, laliophobia
-phonia	pertaining to sound, or voice	dysphonia, aphonia
-phoria	feeling	euphoria
-physis	growth	hypophysis, epiphysis, metaphysis
-plasia	formation, development, a growth	hyperplasia, hypoplasia, dysplasia, aplasia, desmoplasia
-plasm	growth, substance, formation	cytoplasm, neoplasm, ergastoplasm
-plasty	plastic or surgical repair	septoplasty, tympanoplasty
-plegia	paralysis	paraplegia, tetraplegia
-pnea	breathing	dyspnea, orthopnea, tachypnea
-poiesis	formation	erythropoiesis, hematopoiesis
-porosis	passage	osteoporosis
-prandial	meal	postprandial, preprandial
-praxia	in front of, before	apraxia, dyspraxia
-ptosis	dropping, sagging, prolapse	nephroptosis, gastroptosis
-ptysis	spitting	hemoptysis

SUFFIX	DEFINITION	EXAMPLE
-rrhage, -rrhagia	rapid flow of blood, bursting	hemorrhage, lymphorrhage, metrorrhagia
-rrhaphy	suturing, repairing	cystorrhaphy, hymenorrhaphy, neurorrhaphy
-rrhea (AmE)	flow, discharge	diarrhea, lymphorrhea, amenorrhea
-rrhoea (BrE)	flow, discharge	diarrhoea, lymphorrhoea, amenorrhoea
-rrhexis	rupture	karyorrhexis, enterorrhexis
-rupt	break, burst	erupt, interrupt

SUFFIX	DEFINITION	EXAMPLE
-salpinx	fallopian tube	hydrosalpinx, pyosalpinx
-sarcoma	malignant tumor	osteosarcoma, chondrosarcoma
-schisis	split, fissure	retinoschisis
-sclerosis	hardening	glomerulosclerosis, atherosclerosis
-scope	instrument used for visual examination	cystoscope, stethoscope, endoscope
-scopy	visual examination	laparoscopy, bronchoscopy, proctoscopy
-sepsis	infection	asepsis
-spadias	slit, fissure	hypospadias, epispadias
-spasm	sudden involuntary muscle contraction	angiospasm, bronchospasm, colpospasm
-stalsis	contraction	peristalsis
-stasis	control, stop	menostasis, cholestasis, hemostasis
-stenosis	constriction, narrowing	tracheostenosis
-stomy	surgical creation of an opening	colostomy, cutaneostomy, tracheostomy

SUFFIX	DEFINITION	EXAMPLE
-thorax	chest	pneumothorax, hydrothorax
-tic	pertaining to	acoustic, neurotic
-tocia	birth, labor	tomotocia
-tome	instrument used to cut	dermatome, microtome
-tomy	incision, cutting	laparotomy, anatomy, thoracotomy
-tonia	condition or degree of tonus	dystonia, myotonia
-tripsy	surgical crushing	lithotripsy
-trophy	nourishment, development	atrophy, dystrophy, hypertrophy
-tropic	acting on	gonadotropic, corticotropic

SUFFIX	DEFINITION	EXAMPLE
-ule	small, minute	venule, tubule, granule, lobule
-uria	urine, urination	pollakiuria, oliguria, anuria

SUFFIX	DEFINITION	EXAMPLE
-version	turning	anteversion, retroversion

SUFFIX	DEFINITION	EXAMPLE
-y	condition of	atony, telepathy

APPENDIX D

ALPHABETICAL LIST OF COMMON MEDICAL PREFIXES

The following is a list of common medical prefixes. Although different medical terminology sources may have slightly different lists and slightly different meanings, the following is a fairly inclusive list.

PREFIX	DEFINITION	EXAMPLE
a-	without or absence of	ataxia, aplasia, aphasia, atypia
ab-	from, away from	absorption, abduct, abnormal
ad-	to, toward	adhesion, adduct, adrenal
af-	toward	afferent
allo-	other, differing from the normal	allograft
ambi-	around, on both sides, about	ambidextrous, ambivalence
amph(i)-	around, on both sides	amphismela, amphomycin
an-	without or absence of	anorexia, anesthesia, anaerobic, anemia
ana-	up, again, backward	anaphylactic shock, analysis, anaplasia
ante-	before; forward	antenatal, antefebriale, anteflexion
anti-	against	antibody, antitrypsin, antithrombin
apo-	away, separated from, derived from	apoptosis
aut(o)-	self; own	autoimmune, autograph, automatic, autobiography

PREFIX	DEFINITION	EXAMPLE
bary-	weight, pressure; heavy	barylalia, baryphonia
batho-	deep; depth	bathometer, bathophobia
bi-	two	bicuspid, bilateral, bicarbonate, biphasic
bin-	two	binaural, binocular
brachy-	short	brachybasia, brachycephalic, brachydactylia, brachymorphic
brady-	slow	bradycardia, bradykinin

PREFIX	DEFINITION	EXAMPLE
cata-	down	cataplasia, cataract, catabolism
cine-	movement	cineangiography
circum-	around	circumocular, circumcision, circumference
con-	together	congenital, concentric, conjugation
contra-	against	contralateral, contraindication, contraceptive

PREFIX	DEFINITION	EXAMPLE
de-	from, down from, lack of	deformity, dehydration, deoxyribonucleic acid
di-	two, twice	dimer, diaminobenzidine, nitrogen dioxide
dia-	complete; through	diaphragm, dialysis, diarrhea, diaper
diplo-	double	diplopia, diploid
dis-	to undo, to separate; free from, apart	disorientation, disinfection, dissociation
dys-	difficult, labored, painful, abnormal	dysuria, dysfunction, dystrophy, dysplasia

PREFIX	DEFINITION	EXAMPLE
e-	out	eruption, evert, effusion, efferent
ec-, ecto-	outside, outer	ectoderm, ectopic, ectocervix
echo-	repeated sound, reflected sound	echogram, echoencephalogram, echograph, echocardiography
ef-	away from	efferent
en-, end-, endo-	in, within	endoplasmic reticulum, endoscopy, endorphin
em-	before “b”, “m”, and “p”; a variant of “en-”	embitter
epi-	on, upon, over	epidermis, epicardium, epiglottis, epistaxis
eso-	inward	esogastritis, esophoria
eu-	normal, good	euthyroid, eutopic, euphoria
ex-	outside, outward	exacerbation, excise, extraction, external
exo-	outside, outward	exotoxin, exostosis, exophthalmos
extra-	outside of, beyond	extracellular, extrauterine, extravasation

PREFIX	DEFINITION	EXAMPLE
fore-	before, in front, ahead	foregut, foreshadow, foreginger

PREFIX	DEFINITION	EXAMPLE
hemi-	half	hemithyroidectomy, hemisphere, hemiparesis
hetero-	different	heterogeneous, heterochronic, heterosexual
hol-, holo-	entire, complete	holandric, holohedral
homeo-	same, alike	homeostasis, homeopathy

homo-	same	homosexuality, homozygote, homochromatic
hyp-, hypo-	below, incomplete, deficient	hypoplasia, hypoventilation, hypophysis
hyper-	above, excessive	hypertrophy, hypertension, hyperemia
hyps-, hypsi-, hypso-	high; height	hypsarrhythmia, hypsicephaly, hypsography

PREFIX	DEFINITION	EXAMPLE
im-	not; variant of “in-” before “-b-”, “-m-”, “-p-”	imbalance, immature, impotent
in-	in, into; not	incision, indigestion, incontinence
infra-	under, below	infraclavicular, infrascapular
inter-	between	intermittent, intercostal, intercellular
intra-	within	intravenous, intracranial, intracytoplasmic
iso-	same, equal	isotonic, isograft

PREFIX	DEFINITION	EXAMPLE
juxta-	near, beside	juxtaposition, juxtaglomerular

PREFIX	DEFINITION	EXAMPLE
mal-	bad	malnutrition, malformation, malignancy
medi(o)-	middle	mediodorsal, mediopalatal, mediad
mega-	large; enlargement	megacolon, megakaryocyte
megalo-	large; enlargement	cardiomegaly, megaloblast, megalopenia
meso-	middle	mesencephalon, mesocolon, mesentery
meta-	after, beyond, change	metabolism, metastasis, metamorphosis
micro-	small	microsurgery, microcephalic, microscope
mono-	one, single	monoamniotic, monoarthritis
multi-	many	multiple, multicentric, multinucleated

PREFIX	DEFINITION	EXAMPLE
neo-	new	neoplastic, neonate, neocortex
noc-	(to cause) harm, injury or pain	nociception
nulli-	none	nullipara, nulliparity

PREFIX	DEFINITION	EXAMPLE
pachy-	thick	pachyderma, pachygyria
pan-	all, total	panencephalitis, pancytopenia
para-	beside, beyond, around	paraneoplastic, paranasal, paraplegia
per-	through	percutaneous, pertrochanteric fracture, perforation
peri-	surrounding (outer)	pericyte, pericardium, peripheral
pleo-	increase, too much	pleomorphism, pleocytosis
poly-	many, much	polyposis, polyneuropathy, polyclonal
post-	after	postnasal, postpartum, postprandial
pre-	in front of, before	precancerous, prepuce, pretibial
pro-	before	prolapse, progression, promyelocyte
pseud(o)-	false	pseudarthrosis, pseudesthesia, pseudonym

PREFIX	DEFINITION	EXAMPLE
quadri-	four	quadriceps, quadrilateral

PREFIX	DEFINITION	EXAMPLE
re-	back; again; backward	reflex, remission, reconstruction
retro-	back; again; backward	retroperitoneum, retrograde, retrogression

PREFIX	DEFINITION	EXAMPLE
semi-	half	semilunar, seminormal, semicoma
sub-	under, below	subside, sublingual, subacute
super-	over, above	superacute, supernatant, superficial
supra-	above	supraoptic, supranasal, supraventricular
sym-	together, joined; variant of “syn-” before “-b-”, “-m-”, “-p-”	sympathy, sympathetic, symmetry
syn-	together, joined	synapse, syncope, synthesis, synergism

PREFIX	DEFINITION	EXAMPLE
tachy-	fast, rapid	tachypnea, tachycardia, tachyarrhythmia
tauto-	identical, same	tautomeric, tautomerism
tetra-	four	tetraplegia, tetramethyl, tetralogy
trans-	through, across, beyond	transmission, transportation, transhepatic

tri-	three	triad, tricuspid valve, triiodothyronine
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PREFIX	DEFINITION	EXAMPLE
ultra-	beyond, excess	ultrasonic, ultraviolet, ultrafiltration
un-	not	unconsciousness, unsaturated
uni-	one, single	unicellular, unilocular, uniform

PREFIX	DEFINITION	EXAMPLE
xero-	dry	xerosis, xeroderma

APPENDIX E

ALPHABETICAL LIST OF COMMON GREEK AND LATIN MEDICAL NOUNS IN SINGULAR AND PLURAL FORMS

Singular Form	Plural Form	Definition
1. acetabulum	acetabula	the socket of the hip bone, into which the head of the femur fits.
2. acidosis	acidoses	an abnormal condition characterized by reduced alkalinity of the blood and of the body tissues.
3. acinus	acini	1) a small saclike cavity in a gland, surrounded by secretory cells; 2) a region of the lung supplied with air from one of the terminal bronchioles.
4. adenoma	adenomata / adenomas	a benign tumor of a glandular structure or of glandular origin.
5. ala	alae	a wing or a winglike anatomic part or process.
6. alveolus	alveoli	1) any of the many tiny air sacs of the lungs which allow for rapid gaseous exchange; 2) the bony socket for the root of a tooth.
7. alveus	alvei	a thin layer of medullary nerve fibers on the ventricular surface of the hippocampus.
8. amniocentesis	amniocenteses	the surgical insertion of a hollow needle through the abdominal wall and into the uterus to obtain amniotic fluid especially for the determination of fetal sex or chromosomal abnormality.
9. ampulla	ampullae	1) a nearly round bottle with two handles used by the ancient Romans for wine, oil, or perfume; 2) a small dilatation in a canal or duct, especially one in the semicircular canal of the ear.
10. analysis	analyses	detailed examination of the elements or structure of something.
11. anaphylaxis	anaphylaxes	hypersensitivity (as to foreign proteins or drugs) resulting from sensitization following prior contact with the causative agent.
12. anastomosis	anastomoses	the union of parts or branches (as of streams, blood vessels, or leaf veins) so as to intercommunicate or interconnect.
13. angulus	anguli	an anatomical angle.
14. ankylosis	ankyloses	1) stiffness or fixation of a joint by disease or surgery; 2) union of separate bones or hard parts to form a single bone or part.
15. annulus / anulus	annuli / anuli	a small ring or encircling structure, especially any of various ringlike anatomical parts (such as the inguinal ring).
16. antrum	antra	an anatomical cavity within a bone (such as the maxilla) or hollow organ (such as the stomach).
17. aorta	aortae / aortas	the great arterial trunk that carries blood from the heart to be distributed by branch arteries through the body.

18. apex	apices	the pointed end of a cone-shaped part (such as the apex of the lung, root apex, etc.).
19. aphtha	aphthae	a speck, flake, or blister on the mucous membranes (as in the mouth or gastrointestinal tract or on the lips) characteristic of some diseases (as thrush).
20. aponeurosis	aponeuroses	a broad flat sheet of dense fibrous collagenous connective tissue that covers, invests, and forms the terminations and attachments of various muscles.
21. apparatus	apparatus	an arrangement of a number of parts acting together to perform a special function (such as Golgi apparatus, lacrimal apparatus, mitotic apparatus, etc.).
22. appendix	appendices	1) a slender outgrowth or appendage; 2) a small appendage near the juncture of the small intestine and the large intestine (ileocecal valve); 3) supplementary material usually attached at the end of a piece of writing
23. arcus	arcus	an anatomical arch.
24. arrector	arrectores	raising, or that which raises; an erector muscle.
25. arteriola	arteriolae	any of the small terminal twigs of an artery that ends in capillaries; arteriole.
26. atrium	atria	an anatomical cavity or passage, especially the chamber or either of the chambers of the heart that receives blood from the veins and forces it into the ventricle or ventricles.
27. axilla	axillae	the cavity beneath the junction of a forelimb and the body; the armpit.
28. bacillus	bacilli	any of a genus (<i>Bacillus</i>) of rod-shaped gram-positive usually aerobic bacteria producing endospores and including many saprophytes and some parasites.
29. bacterium	bacteria	a unicellular prokaryotic microorganism that usually multiplies by cell division and has a cell wall that provides a constancy of form.
30. basis	bases	the lower, basic, or fundamental part of an object, organ, or substance. Anatomic nomenclature for the base of a structure or organ, or the part opposite to or distinguished from the apex.
31. blastoma	blastomata / blastomas	a type of cancer caused by malignancies in precursor cells, which are commonly referred to as blasts.
32. brachium	brachia	the upper segment of the arm or forelimb extending from the shoulder to the elbow.
33. bronchus	bronchi	either of the two primary divisions of the trachea that lead respectively into the right and the left lung.
34. bulla	bullae	1) circumscribed, fluid-containing, elevated lesion of the skin, usually more than 5 mm in diameter; called also blister and bleb; 2) an anatomical structure with a blisterlike appearance.
35. bursa	bursae	a small fluid-filled sac or saclike cavity situated in places in tissues where friction would otherwise occur.
36. calculus	calculi	an abnormal concretion, usually composed of mineral salts, occurring within the body, chiefly in hollow organs

		or their passages; also called stone (such as a kidney stone, gallstone, etc.).
37. calyx	calyces	a cuplike division of the renal pelvis surrounding one or more renal papillae.
38. canaliculus	canaliculi	a minute canal in a bodily structure.
39. candidiasis	candidiases	infection with the fungus <i>Candida</i> , a common cause of vaginitis.
40. caries	caries	a progressive destruction of bone or tooth; tooth decay.
41. cecum	ceca	a blind pouch at the beginning of the large intestine.
42. cerebellum	cerebella	a large dorsally projecting part of the brain concerned especially with the coordination of muscles and the maintenance of bodily equilibrium, situated between the brain stem and the back of the cerebrum, and formed in humans of two lateral lobes and a median lobe.
43. cerebrum	cerebra	the main portion of the brain, occupying the upper part of the cranial cavity.
44. cervix	cervices	neck; usually means the lower narrow portion (neck) of the uterus; also called the cervix uteri.
45. chorda	chordae	a bodily structure (as a tendon or nerve) resembling a cord.
46. cicatrix	cicatrices	a scar left by the formation of new connective tissue over a healing sore or wound.
47. cilium	cilia	1) a minute short hairlike process often forming part of a fringe; 2) an eyelash.
48. clitoris	clitorides / clitorises	an erectile female genital organ at the anterior end of the vulva, which contains numerous sensory nerve endings and plays a major role in sexual arousal and pleasure in women.
49. coccus	cocci	a spherical bacterium.
50. cochlea	cochleae	a hollow tube in the inner ear of higher vertebrates that is usually coiled like a snail shell and contains the sensory organ of hearing.
51. concha	conchae	a shell-shaped structure. In anatomy, a structure comparable with a shell in shape, as the auricle or pinna of the ear or a turbinate bone in the nose.
52. conjunctiva	conjunctivae	the mucous membrane that lines the inner surface of the eyelids and is continued over the forepart of the eyeball.
53. corpus	corpora	1) the body of a human or animal especially when dead; 2) the main part or body of a bodily structure or organ (e.g., the corpus of the uterus).
54. corpusculum	corpuscula	1) a small mass or body; 2) a blood cell.
55. cortex	cortices	1) the outer layer of an internal organ or body structure, as of the kidney or adrenal gland; 2) the outer layer of gray matter that covers the surface of the cerebral hemisphere.
56. crisis	crises	1) a sudden change, usually for the better, in the course of an acute disease, in contrast to the gradual improvement by lysis;

		2) a paroxysmal pain in an organ or circumscribed region of the body occurring in the course of tabetic neurosyphilis; 3) a convulsive attack.
57. crista	cristae	any of the inwardly projecting folds of the inner membrane of a mitochondrion.
58. criterion	criteria	1) a standard or rule for judging; usually plural (i.e., criteria) to denote a set of standards or rules; 2) in psychology, a standard such as school grades against which test scores on intelligence tests or other measured behaviors are validated; 3) a list of manifestations of a disease or disorder, a certain number of which must be present to warrant diagnosis in a given patient.
59. crus	crura	any of various anatomical parts that resemble a leg or a pair of legs.
60. cuspis	cupides	a pointed or rounded projection, such as on the crown of a tooth, or a segment of a cardiac valve (e.g., Carabelli cusp, semilunar cusp, etc.).
61. datum	data	a piece of information acquired by observation, measurement, or experiment and used as a basis for calculation or inference.
62. diagnosis	diagnoses	1) determination of the nature of a cause of a disease; 2) a concise technical description of the cause, nature, or manifestations of a condition, situation, or problem.
63. diaphoresis	diaphoreses	profuse sweating.
64. diaphysis	diaphyses	the shaft of a long bone.
65. diarthrosis	diarthroses	1) articulation that permits free movement; 2) a freely movable joint.
66. diverticulum	diverticula	a circumscribed pouch or sac occurring normally or created by herniation of the lining mucous membrane through a defect in the muscular coat of a tubular organ.
67. diuresis	diureses	an increased excretion of urine.
68. duodenum	duodena	the first part of the small intestine extending from the pylorus to the jejunum.
69. ecchymosis	ecchymoses	the escape of blood into the tissues from ruptured blood vessels.
70. edema	edemata / edemas	a condition of abnormally large fluid volume in the circulatory system or in tissues between the body's cells (interstitial spaces).
71. emesis	emeses	an act or instance of vomiting.
72. embolus	emboli	an abnormal particle (such as an air bubble) circulating in the blood.
73. endocardium	endocardia	a thin serous membrane lining the cavities of the heart.
74. endometrium	endometria	the inner lining of the uterus.
75. epicardium	epicardia	the inner layer of the pericardium that closely envelops the heart.
76. epididymis	epididymes	a coiled tube on the surface of the testis that stores sperm until ejaculation.
77. epiphysis	epiphyses	1) a part or process of a bone that ossifies separately and later becomes ankylosed to the main part of the bone;

		2) pineal gland (a.k.a. the epiphysis cerebri).
78. equilibrium	equilibria / equilibriums	the sense of balance.
79. esophagus	esophagi	the part of the alimentary canal which connects the throat to the stomach. In humans and other vertebrates, it is a muscular tube lined with mucous membrane.
80. fascia	fasciae	the fibrous sheath of connective tissue that covers a muscle; called deep fascia to differentiate it from the superficial fascia that underlies the skin.
81. fibra	fibrae	1) an elongated threadlike structure; 2) dietary fiber; 3) nerve fiber.
82. fibroma	fibromata / fibromas	a benign tumor consisting mainly of fibrous tissue.
83. fibula	fibulae	the lateral and smaller of the two bones of the lower leg.
84. fimbria	fimbriae	1) a bordering fringe especially at the entrance of the fallopian tubes; 2) a pilus of a bacterium.
85. fistula	fistulae	an abnormal passage that leads from an abscess or hollow organ or part to the body surface or from one hollow organ or part to another and that may be surgically created to permit passage of fluids or secretions.
86. flagellum	flagella	(Latin for “whip” or “scourge”) a hairlike appendage that protrudes from certain plant and animal sperm cells, from fungal spores (zoospores), and from a wide range of microorganisms to provide motility.
87. focus	foci	1) a center of activity, attraction, or attention; 2) the center, or the starting point, of a disease process; 3) the point at which the light rays meet after passing through a convex lens.
88. foramen	foramina	a natural opening or passage, especially one into or through a bone.
89. fornix	fornices	an anatomical archlike structure.
90. frenulum	frenula	a small fold of integument or mucous membrane that limits the movements of an organ or part.
91. fungus	fungi	any of a group of spore-producing organisms feeding on organic matter, including molds, yeast, mushrooms, and toadstools.
92. ganglion	ganglia	1) a small cystic tumor connected either with a joint membrane or tendon sheath; 2) a mass of nerve tissue containing cell bodies of neurons external to the brain or spinal cord.
93. genus	genera	a class, kind, or group marked by common characteristics or by one common characteristic.
94. gingiva	gingivae	the part of the oral mucosa covering the tooth-bearing border of the jaw; also called gum.
95. glomerulus	glomeruli	a small convoluted or intertwined mass, especially a tuft of capillaries at the point of origin of each vertebrate nephron that passes a protein-free filtrate to the surrounding Bowman’s capsule.

96. gravida	gravidae	a pregnant woman; often used with a number to indicate the number of pregnancies a woman has had (e.g., primigravida).
97. gyrus	gyri	a ridge or fold between two clefts on the cerebral surface in the brain.
98. hernia	herniae / hernias	protrusion of an organ through an abnormal opening; commonly called a rupture.
99. humerus	humeri	the long bone of the upper arm or forelimb extending from the shoulder to the elbow.
100. hydronephrosis	hydronephroses	collection of urine in the renal pelvis caused by obstruction; results in distention and renal atrophy.
101. hydrothorax	hydrothoraces	an excess of serous fluid in the pleural cavity.
102. hypothesis	hypotheses	a supposition that appears to explain a group of phenomena and is advanced as a basis for further investigation.
103. ileum	ileum	the last division of the small intestine extending between the jejunum and large intestine.
104. ilium	ilia	the broad, dorsal, upper, and largest of the three principal bones composing either half of the pelvis.
105. incus	incudes	the middle bone of a chain of three small bones in the ear of a mammal.
106. index	indices	1) the numerical ratio of measurement of any part in comparison with a fixed standard; 2) forefinger.
107. iris	irides	the colored part around the pupil of the eye that changes in size to control the amount of light entering the pupil.
108. isthmus	isthmi	a narrow anatomical part or passage connecting two larger structures or cavities.
109. jugum	juga	an anatomical ridge or groove connecting two structures.
110. keratosis	keratoses	an area of skin marked by overgrowth of horny tissue.
111. lamella	lamellae	a thin layer, membrane, or plate of tissue, especially in bone.
112. larva	larvae	1) the active immature form of an insect, especially one that differs greatly from the adult and forms the stage between egg and pupa (e.g., a caterpillar or grub); 2) an immature form of other animals that undergo some metamorphosis (e.g., a tadpole).
113. larynx	larynges	the hollow muscular organ forming an air passage to the lungs and holding the vocal cords in humans and other mammals; the voice box.
114. lipoma	lipomata / lipomas	a benign tumor of fatty tissue.
115. locus	loci	1) the place where something is situated or occurs; site, location; 2) a center of activity, attention, or concentration; 3) the position in a chromosome of a particular gene or allele.
116. lumen	lumina	the central cavity of a tubular or other hollow structure in an organism or cell.

117. lunula	lunulae	a small crescent-shaped structure or marking, especially the white area at the base of a fingernail that resembles a half-moon.
118. macula	maculae	a small spot or colored area; used alone to mean the yellowish spot in the retina that contains the fovea.
119. malleus	mallei	the outermost of a chain of three small bones of the mammalian middle ear.
120. matrix	matrices	1) something within or from which something else originates, develops, or takes form; 2) material in which something is enclosed or embedded (as for protection or study); 3) the extracellular substance in which tissue cells (as of connective tissue) are embedded.
121. mediastinum	mediastina	the space between the lungs together with the organs contained in this space.
122. medium	media	1) something in a middle position; 2) means of effecting or conveying something.
123. meninx	meninges	any of the three membranes that envelop the brain and spinal cord.
124. mesogastrium	mesogastria	the middle region of the abdomen between the epigastrium and the hypogastrium.
125. metastasis	metastases	the development of secondary malignant growths at a distance from a primary site of cancer.
126. mitosis	mitoses	cell division.
127. nevus	nevi	a congenital or acquired usually highly pigmented area on the skin that is either flat or raised; a birthmark or a mole.
128. neuroma	neuromata / neuromas	a tumor or mass growing from a nerve and usually consisting of nerve fibers.
129. neurosis	neuroses	a relatively mild mental disorder characterized by excessive anxiety, insecurity, or obsession, usually compensated for by various defense mechanisms.
130. nidus	nidi	1) a nest or breeding place, especially a place or substance in an animal or plant where bacteria or other organisms lodge and multiply; 2) a place where something originates, develops, or is located.
131. nucleus	nuclei	the membrane-enclosed organelle within a cell that contains the chromosomes.
132. omentum	omenta	a fold of peritoneum connecting or supporting abdominal structures (such as the stomach and liver).
133. orthosis	orthoses	an external medical device or apparatus (such as a brace or splint) used in orthopedics for supporting, immobilizing, or treating muscles, joints, or skeletal parts which are weak, ineffective, deformed, or injured.
134. ovum	ova	a female gamete.
135. papilla	papillae	a small rounded protuberance on a part or organ of the body.
136. patella	patellae	a thick flat triangular movable bone that forms the anterior point of the knee and protects the front of the joint; a kneecap.

137. paries	parietes	the wall of a cavity or hollow organ; usually used in plural.
138. pelvis	pelvis / pelvises	a basin-shaped structure in the skeleton of many vertebrates that is formed by the pelvic girdle and adjoining bones of the spine.
139. pericardium	pericardia	the fibrous sac that surrounds the heart.
140. perineum	perinea	the region between the thighs from the external genitalia to the anus.
141. periosteum	periosteal	the membrane of connective tissue that closely invests all bones except at the articular surfaces.
142. peristalsis	peristalses	wave-like contractions of an organ's walls; moves material through an organ or duct.
143. peritoneum	peritonea	the large serous membrane that lines the abdominal cavity and supports the abdominal organs.
144. petechia	petechiae	a minute reddish or purplish spot containing blood that appears in skin or mucous membrane as a result of localized hemorrhage.
145. phalanx	phalanges	one of the digital bones of the hand or foot of a vertebrate.
146. pharynx	pharynges	the throat; a common passageway for food entering the esophagus and air entering the larynx.
147. phenomenon	phenomena	1) a fact or situation that is observed to exist or happen, especially one whose cause or explanation is in question; 2) a remarkable person or thing.
148. pinna	pinnae	the projecting part of the outer ear; auricle.
149. placenta	placentae	the organ composed of fetal and maternal tissues that nourishes and maintains the developing fetus.
150. pleura	pleurae	the delicate serous membrane that lines each half of the thorax of mammals and is folded back over the surface of the lung of the same side.
151. plexus	plexi	1) a structure in the form of a network, especially of nerves, blood vessels, or lymphatics (e.g., the cardiac plexus, the pelvic plexus); 2) a combination of interlaced parts; a network.
152. plica	plicae	a fold or folded part, especially a groove or fold of skin.
153. pneumoconiosis	pneumoconioses	a disease of the lungs caused by the habitual inhalation of irritants (such as mineral or metallic particles).
154. pneumothorax	pneumothoraces	a condition in which air or other gas is present in the pleural cavity and which occurs spontaneously as a result of disease or injury of lung tissue, rupture of air-filled pulmonary cysts, or puncture of the chest wall or is induced as a therapeutic measure to collapse the lung.
155. pons	pontes	a broad mass of chiefly transverse nerve fibers in the mammalian brain stem lying ventral to the cerebellum at the anterior end of the medulla oblongata.
156. prognosis	prognoses	the prospect of recovery as anticipated from the usual course of disease or peculiarities of the case.
157. prosthesis	prostheses	an artificial device used to replace a missing body part, such as a limb, tooth, eye, or heart valve.
158. protozoon	protozoa	any of numerous chiefly single-celled eukaryotic organisms, most of which move about freely and ingest

		food, including the amoebas, ciliates, flagellates, and apicomplexans.
159. psychosis	psychoses	serious mental illness (such as schizophrenia) characterized by defective or lost contact with reality often with hallucinations or delusions.
160. pubis	pubes	the ventral and anterior of the three principal bones composing either half of the pelvis.
161. pylorus	pylori	the muscular opening from the vertebrate stomach into the intestine.
162. pyothorax	pyothoraces	accumulation of pus in the pleural space; empyema.
163. rectum	recta	the terminal part of the intestine from the sigmoid colon to the anus.
164. reticulum	reticula	the second compartment of the stomach of a ruminant in which folds of the mucous membrane form hexagonal cells.
165. retina	retinae	the innermost, light-sensitive layer of the eye; contains the rods and cones, the specialized receptor cells for vision.
166. retinaculum	retinacula	any of several fibrous bands of fascia that pass over or under tendons (as at or near the ankle or wrist) and help to keep them in place.
167. ruga	rugae	an anatomical fold or wrinkle (as of the gastric mucous membranes); usually used in plural.
168. sacculus	sacculi	1) a small sac; 2) the smaller of two membranous sacs in the vestibule of the inner ear.
169. salpinx	salpinges	another name for Fallopian tube, Eustachian tube.
170. sarcoma	sarcomata / sarcomas	a malignant tumor arising from bone or from soft tissues such as muscle, cartilage, fat, or blood or lymph vessels.
171. scapula	scapulae	either of two large, flat, triangular bones forming the back part of the shoulder; a shoulder blade.
172. sclera	sclera	the dense fibrous opaque white outer coat enclosing the eyeball except the part covered by the cornea.
173. scrotum	scrota	the external pouch that in most mammals contains the testes.
174. sepsis	sepsis	the presence of harmful microorganisms or their toxins in the blood or other tissues.
175. septum	septa	a dividing wall or membrane especially between bodily spaces or masses of soft tissue.
176. serum	sera	1) the clear yellowish fluid obtained upon separating whole blood into its solid and liquid components after it has been allowed to clot; also called blood serum; 2) blood serum from the tissues of immunized animals, containing antibodies and used to transfer immunity to another individual; 3) watery fluid from animal tissue, such as that found in edema; 4) whey.
177. spectrum	spectra	1) a band of colors, as seen in a rainbow, produced by separation of the components of light by their different degrees of refraction according to wavelength;

		2) the entire range of wavelengths of electromagnetic radiation; 3) a wide range.
178. spermatozoon	spermatozoa	the mature male gamete of an animal, usually consisting of a nucleate head, a short neck, and a thin motile tail.
179. spina	spinae	(anatomy) the spine.
180. stigma	stigmata / stigmas	1) a visible indicator of disease; 2) a small bodily mark, especially a birthmark or scar, that is congenital or indicative of a condition or disease;
181. stimulus	stimuli	1) something causing or regarded as causing a response; 2) an agent, action, or condition that elicits or accelerates a physiological or psychological activity or response.
182. stratum	strata	1) a horizontal layer of material, especially one of several parallel layers arranged one on top of another; 2) a layer of tissue: the epithelial stratum; 3) a level of society composed of people with similar social, cultural, or economic status.
183. stria	striae	1) a thin, narrow groove or channel; 2) a thin line or band, especially one of several that are parallel or close together (e.g., a characteristic stria of contractile tissue).
184. stoma	stomata	a surgically created opening to the body surface or between two organs (literally “mouth”).
185. sulcus	sulci	a shallow furrow or groove, as on the surface of the cerebrum.
186. symphysis	symphyses	1) an immovable or more or less movable articulation of various bones in the median plane of the body; 2) an articulation in which the bony surfaces are connected by pads of fibrous cartilage without a synovial membrane.
187. testis	testes	a typically paired male reproductive gland that produces sperm and secretes testosterone and that in most mammals is contained within the scrotum at sexual maturity.
188. thalamus	thalami	the largest subdivision of the diencephalon that consists chiefly of an ovoid mass of nuclei in each lateral wall of the third ventricle and serves chiefly to relay impulses and especially sensory impulses to and from the cerebral cortex.
189. thesis	theses	1) a statement or theory that is put forward as a premise to be maintained or proved; 2) a long essay or dissertation involving personal research, written by a candidate for a university degree.
190. thoracentesis	thoracenteses	surgical puncture of the chest for removal of air or fluids, such as may accumulate after surgery or as a result of injury, infection, or cardiovascular problems; also called thoracocentesis.
191. thorax	thoraces	the part of the human body between the neck and the diaphragm, partially encased by the ribs and containing the heart and lungs; the chest.

192. thrombus	thrombi	a clot of blood formed within a blood vessel and remaining attached to its place of origin.
193. urethra	urethrae	the canal that in most mammals carries off the urine from the bladder and in the male serves also as a passageway for semen.
194. uterus	uteri	the organ that receives the fertilized egg and maintains the developing offspring during pregnancy.
195. uvula	uvulae	the pendent fleshy lobe in the middle of the posterior border of the soft palate.
196. vagina	vaginae	the muscular tube between the cervix and the vulva.
197. varix	varices	an abnormally dilated or swollen blood or lymph vessel and especially a vein (as of the esophagus or stomach).
198. vertebra	vertebrae	each of the series of small bones forming the backbone, having several projections for articulation and muscle attachment, and a hole through which the spinal cord passes.
199. villus	villi	1) one of the numerous vascular projections of the small intestine; 2) one of the fingerlike projections of the chorion that contribute to the formation of the placenta in mammals.
200. viscus	viscera	an internal organ of the body especially the one (such as the heart, liver, or intestine) located in the great cavity of the trunk proper.
201. vortex	vortices	1) a whirling mass of water or air that sucks everything near it toward its center; 2) a place or situation regarded as drawing into its center all that surrounds it, and hence being inescapable or destructive.
202. vulva	vulvae	the external parts of the female genital organs.
203. xanthoma	xanthomata / xanthomas	a fatty irregular yellow patch or nodule containing lipid-filled foam cells that occurs on the skin (as of the eyelids, neck, or back) or in internal tissue and is associated especially with disturbances of lipid metabolism.
204. xanthosis	xanthoses	yellow discoloration of the skin from abnormal causes.
205. zona	zonae	a zone or a beltlike encircling structure of the body.

APPENDIX F

FLASHCARDS

An excellent way to learn new medical vocabulary is by using flashcards. These have proved so successful that a section of flashcards has been included. The flashcards are presented in unit order so that they can be used in sequence as you progress through the textbook. Of course, these cards represent only a portion of the necessary vocabulary, and you can add to the collection with cards of your own using the same pattern. You can take word parts and their definitions from Appendices B, C, and D.

WORD PART GAMES

Here are some games you can play with one or more partners to help you learn parts of medical terms using the flashcards. The games can be used in Medical English classes as well as for self-studying.

The Matchup Game

Distribute flashcards with word parts and flashcards with their definitions to the groups/pairs*. The players in each group/pair have to match up the word parts and their definitions. The first group/pair to correctly match everything up wins.

The Review Game

Word Parts Up: Shuffle the deck of flashcards*. Put the pile, word parts up, in the center of the desk. Take turns choosing a card from anywhere in the deck and giving the definition of the word part shown. If you get it right, you get to keep it. If you miss, it goes into the discard pile. When the draw pile is gone, whoever has the largest pile, wins.

Definitions Up: Shuffle the deck of flashcards and place them with the definition side up. Play the review game the same way.

The Create-a-Word Game

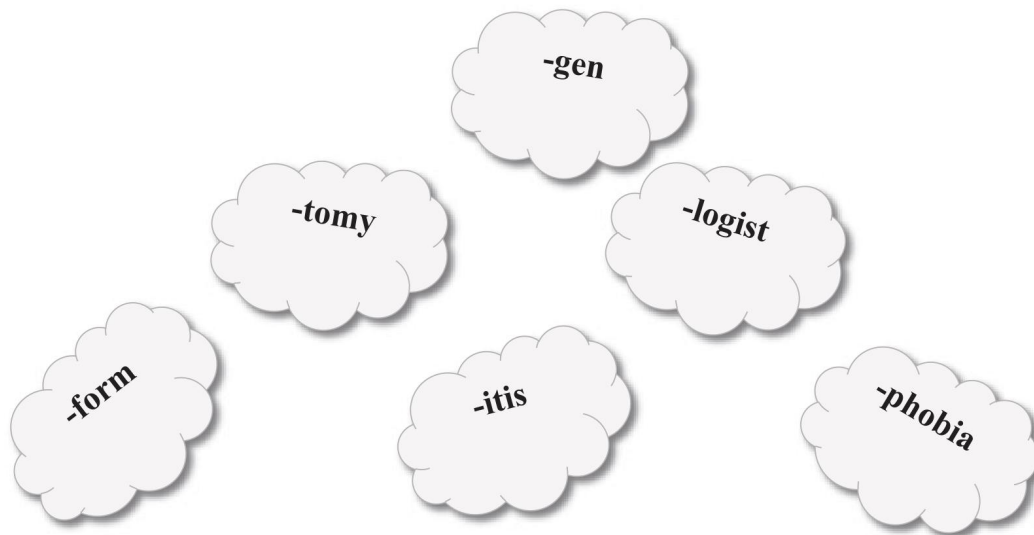
Shuffle the deck and deal each person a specific number of cards (for example, 10), word parts up*. Place the remaining draw pile in the center of the desk, word parts down.

Each player should try to create as many legitimate medical terms as possible using the cards he or she has dealt with, then take turns discarding one card (word part up, in the discard pile) and taking one. When it is your turn to discard a card, you may choose either the card the previous player discarded or a “mystery card” from the draw pile. Continue working on words until all the cards in the draw pile have been taken.

To score, each player must define every term created correctly. If the definition is correct, the player receives one point for each card used. If it is incorrect, two points are deducted for each card with that term. Cards left unused each count as one point off. Whoever has the highest number of points wins.

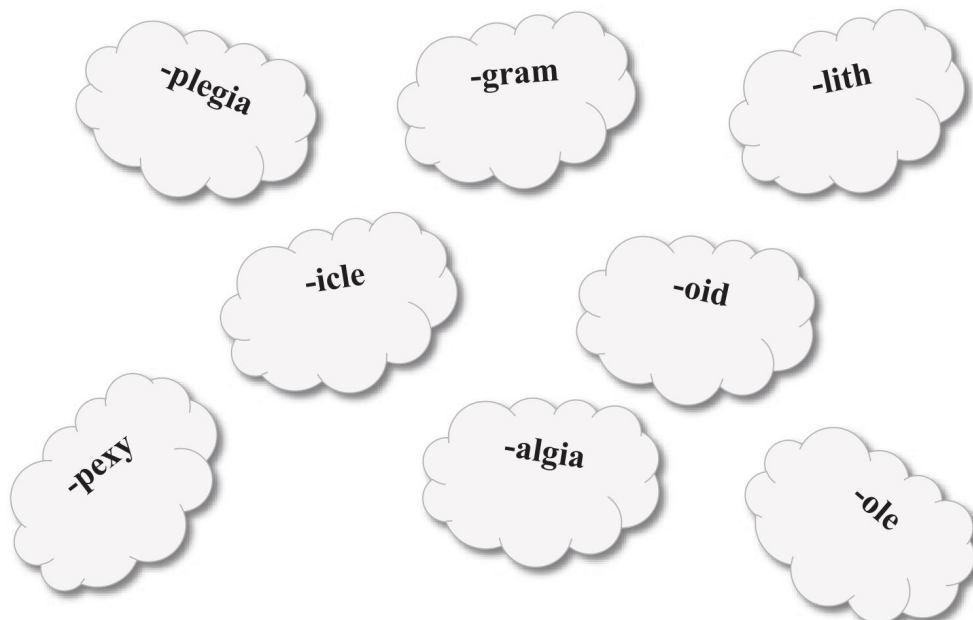
Note: Use your medical dictionary if there is any doubt that a term is legitimate.

* The flashcards you will use may represent the same type of word parts (e.g., “Common Surgical Suffixes”) or two or more different types of word parts.



Suffixes

Flashcards



Common Surgical Suffixes (#1): Word Parts

<i>word part</i> -centesis	<i>word part</i> -plasty
<i>word part</i> -desis	<i>word part</i> -tripsy
<i>word part</i> -stomy	<i>word part</i> -tomy
<i>word part</i> -rrhaphy	<i>word part</i> -lysis

Common Surgical Suffixes (#1): Meanings

<i>meaning</i> surgical repair	<i>meaning</i> surgical puncture
<i>meaning</i> crushing	<i>meaning</i> binding, fixation (of a bone or joint)
<i>meaning</i> incision	<i>meaning</i> forming an opening
<i>meaning</i> separation; destruction; loosening	<i>meaning</i> suture

Common Surgical Suffixes (#2): Word Parts

<i>word part</i> -ectomy	<i>word part</i> -pexy
<i>word part</i> -centesis	<i>word part</i> -clasis
<i>word part</i> -rrhaphy	<i>word part</i> -tome
<i>word part</i> -tomy	<i>word part</i> -lysis

Common Surgical Suffixes (#2): Meanings

<i>meaning</i> fixation (of an organ)	<i>meaning</i> excision, removal
<i>meaning</i> surgical fracture	<i>meaning</i> surgical puncture
<i>meaning</i> instrument to cut	<i>meaning</i> suture
<i>meaning</i> separation; destruction; loosening	<i>meaning</i> incision

Diagnostic Suffixes: Word Parts

<i>word part</i> -graph	<i>word part</i> -meter
<i>word part</i> -graphy	<i>word part</i> -scope
<i>word part</i> -scopy	<i>word part</i> -gram
<i>word part</i> -metry	

Diagnostic Suffixes: Meanings

<i>meaning</i> instrument for measuring	<i>meaning</i> instrument for recording
<i>meaning</i> instrument for examining	<i>meaning</i> process of recording
<i>meaning</i> record, writing	<i>meaning</i> visual examination
	<i>meaning</i> act of measuring

Pathological and Related Suffixes (#1): Word Parts

<i>word part</i> -emesis	<i>word part</i> -malacia
<i>word part</i> -genesis	<i>word part</i> -cele
<i>word part</i> -oma	<i>word part</i> -pathy
<i>word part</i> -osis	<i>word part</i> -plasia

Pathological and Related Suffixes (#1): Meanings

<i>meaning</i> softening	<i>meaning</i> vomiting
<i>meaning</i> hernia, swelling	<i>meaning</i> forming, producing, origin
<i>meaning</i> disease	<i>meaning</i> tumor
<i>meaning</i> formation, growth	<i>meaning</i> abnormal condition; increase (used primarily with blood cells)

Pathological and Related Suffixes (#2): Word Parts

<i>word part</i> -iasis	<i>word part</i> -megaly
<i>word part</i> -algia	<i>word part</i> -emia
<i>word part</i> -penia	<i>word part</i> -edema
<i>word part</i> -plasia	<i>word part</i> -sclerosis

Pathological and Related Suffixes (#2): Meanings

<i>meaning</i> enlargement	<i>meaning</i> abnormal condition (produced by something specific)
<i>meaning</i> blood condition	<i>meaning</i> pain
<i>meaning</i> swelling	<i>meaning</i> decrease, deficiency
<i>meaning</i> abnormal condition of hardening	<i>meaning</i> formation, growth

Pathological and Related Suffixes (#3): Word Parts

<i>word part</i> -ectasis	<i>word part</i> -phasia
<i>word part</i> -itis	<i>word part</i> -lith
<i>word part</i> -stasis	<i>word part</i> -gen
<i>word part</i> -dynia	<i>word part</i> -phagia

Pathological and Related Suffixes (#3): Meanings

<i>meaning</i> speech	<i>meaning</i> dilation, expansion
<i>meaning</i> stone, calculus	<i>Meaning</i> inflammation
<i>meaning</i> forming, producing, origin	<i>meaning</i> stopping, controlling
<i>meaning</i> eating, swallowing	<i>meaning</i> pain

Pathological and Related Suffixes (#4): Word Parts

<i>word part</i> -rrhagia	<i>word part</i> -trophy
<i>word part</i> -plegia	<i>word part</i> -plasm
<i>word part</i> -stenosis	<i>word part</i> -rrhexis
<i>word part</i> -spasm	<i>word part</i> -ptosis

Pathological and Related Suffixes (#4): Meanings

<i>meaning</i> nourishment, development	<i>meaning</i> bursting forth (of)
<i>meaning</i> formation, growth	<i>meaning</i> paralysis
<i>meaning</i> rupture	<i>meaning</i> narrowing, stricture
<i>meaning</i> prolapse, downward displacement	<i>meaning</i> involuntary contraction, twitching

Pathological and Related Suffixes (#5): Word Parts

<i>word part</i> -ectasis	<i>word part</i> -stenosis
<i>word part</i> -rrhea	<i>word part</i> -rrhage
<i>word part</i> -toxic	<i>word part</i> -pathy
<i>word part</i> -osis	<i>word part</i> -iasis

Pathological and Related Suffixes (#5): Meanings

<i>meaning</i> narrowing, stricture	<i>meaning</i> dilation, expansion
<i>meaning</i> bursting forth (of)	<i>meaning</i> discharge, flow
<i>meaning</i> disease	<i>meaning</i> poison
<i>meaning</i> abnormal condition (produced by something specific)	<i>meaning</i> abnormal condition; increase (used primarily with blood cells)

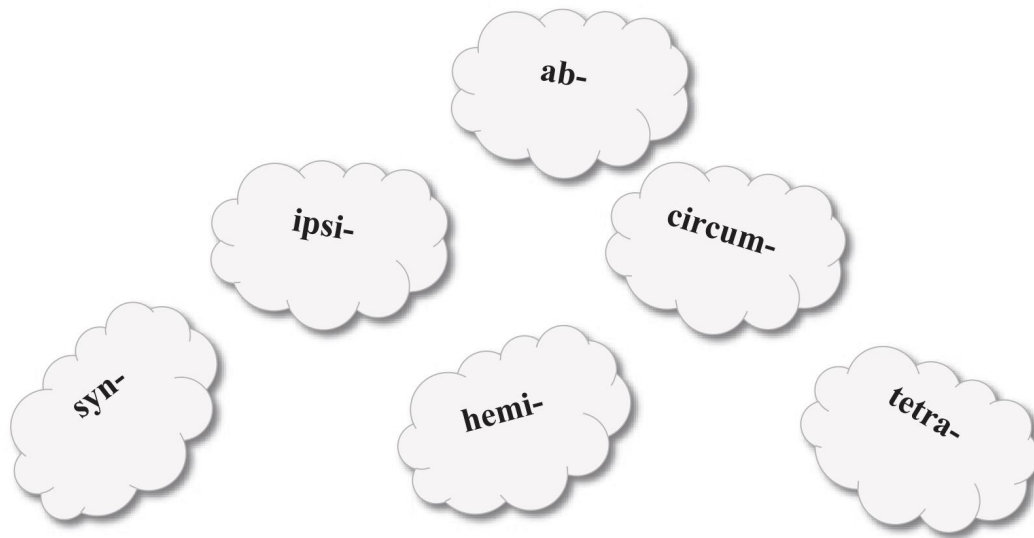
Grammatical Suffixes: Word Parts

<i>word part</i> icle, -ole, -ule	<i>word part</i> -ician, -ist
<i>word part</i> -esis, -ia, -ism	<i>word part</i> -y
<i>word part</i> -iatry	<i>word part</i> -form, -oid
<i>word part</i> -al, -ory, -tic	<i>word part</i> -eal, -ary, -ior

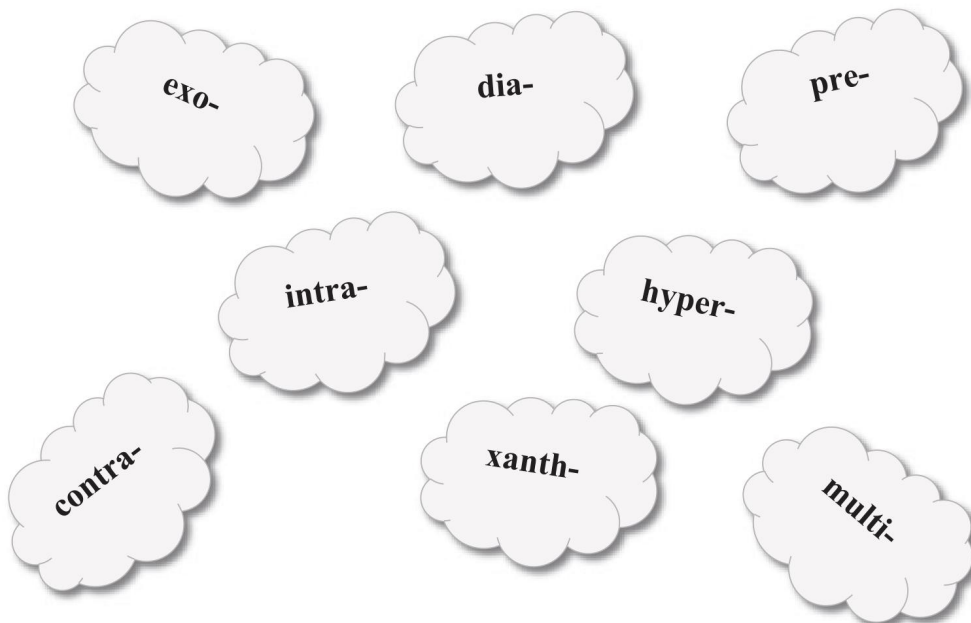
Grammatical Suffixes: Meanings

<i>meaning</i> specialist	<i>meaning</i> small, minute
<i>meaning</i> condition; process	<i>meaning</i> condition
<i>meaning</i> resembling to	<i>meaning</i> medicine; treatment
<i>meaning</i> pertaining to	<i>meaning</i> pertaining to

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Prefixes Flashcards



Prefixes of Position (#1): Word Parts

<i>word part</i> retro-	<i>word part</i> inter-
<i>word part</i> epi-	<i>word part</i> ex-
<i>word part</i> pro-	<i>word part</i> infra-
<i>word part</i> dextr-	<i>word part</i> sinistr-

Prefixes of Position (#1): Meanings

<i>meaning</i> between	<i>meaning</i> backward, behind
<i>meaning</i> away from; outside	<i>meaning</i> above, upon
<i>meaning</i> under, below	<i>meaning</i> before, in front of
<i>meaning</i> left	<i>meaning</i> right

Prefixes of Position (#2): Word Parts

<i>word part</i> hypo-	<i>word part</i> post-
<i>word part</i> ipsi-	<i>word part</i> ec-, ecto-
<i>word part</i> pre-	<i>word part</i> end-, end/o-
<i>word part</i> sub-	<i>word part</i> syn-, sym-

Prefixes of Position (#2): Meanings

<i>meaning</i> after, behind	<i>meaning</i> under, below, deficient
<i>meaning</i> out; outside	<i>meaning</i> same
<i>meaning</i> in; within	<i>meaning</i> before, in front of
<i>meaning</i> together	<i>meaning</i> under, below

Prefixes of Number and Measurement (#1): Word Parts

<i>word part</i> tetra-	<i>word part</i> di-
<i>word part</i> dipl-	<i>word part</i> hemi-
<i>word part</i> tri-	<i>word part</i> multi-
<i>word part</i> semi-	<i>word part</i> macro-

Prefixes of Number and Measurement (#1): Meanings

<i>meaning</i> two, twice	<i>meaning</i> four
<i>meaning</i> one half	<i>meaning</i> double
<i>meaning</i> many, much	<i>meaning</i> three
<i>meaning</i> large	<i>meaning</i> half; partial

Prefixes of Number and Measurement (#2): Word Parts

<i>word part</i> mono-	<i>word part</i> hyper-
<i>word part</i> bi-	<i>word part</i> micro-
<i>word part</i> primi-	<i>word part</i> poly-
<i>word part</i> nulli-	<i>word part</i> diplo-

Prefixes of Number and Measurement (#2): Meanings

<i>meaning</i> excessive, above normal	<i>meaning</i> one
<i>meaning</i> small	<i>meaning</i> double
<i>meaning</i> many, much	<i>meaning</i> first
<i>meaning</i> double	<i>meaning</i> none

Prefixes of Direction (#1): Word Parts

<i>word part</i> ab-	<i>word part</i> ad-
<i>word part</i> exo-	<i>word part</i> peri-
<i>word part</i> ultra-	<i>word part</i> intra-
<i>word part</i> para-	<i>word part</i> trans-

Prefixes of Direction (#1): Meanings

<i>meaning</i> toward	<i>meaning</i> from, away from
<i>meaning</i> around	<i>meaning</i> outside, outward
<i>meaning</i> in, within	<i>meaning</i> excess, beyond
<i>meaning</i> through, across	<i>meaning</i> near, beside; beyond

Prefixes of Direction (#2): Word Parts

<i>word part</i> ecto-	<i>word part</i> endo-
<i>word part</i> peri-	<i>word part</i> per-
<i>word part</i> super-	<i>word part</i> supra-
<i>word part</i> dia-	<i>word part</i> extra-

Prefixes of Direction (#2): Meanings

<i>meaning</i> in, within	<i>meaning</i> outside, outward
<i>meaning</i> through	<i>meaning</i> around
<i>meaning</i> above; excessive; superior	<i>meaning</i> upper, above
<i>meaning</i> outside, outward	<i>meaning</i> through, across

Negative Prefixes and Prefixes for Colors: Word Parts

<i>word part</i> in-, im-, non-, un-	<i>word part</i> anti-, contra-
<i>word part</i> a-, an-	<i>word part</i> xanth-
<i>word part</i> de-	<i>word part</i> dis-
<i>word part</i> leuk-, leuc-	<i>word part</i> erythr-

Negative Prefixes and Prefixes for Colors: Meanings

<i>meaning</i> without, not	<i>meaning</i> not
<i>meaning</i> yellow	<i>meaning</i> without, not
<i>meaning</i> absence, removal, separation	<i>meaning</i> down, without
<i>meaning</i> red	<i>meaning</i> white

Prefixes for Colors and Degree: Word Parts

<i>word part</i> melan-	<i>word part</i> olig-
<i>word part</i> hyper-	<i>word part</i> super-
<i>word part</i> chlor-	<i>word part</i> cyan-
<i>word part</i> alb-, albin-	<i>word part</i> pan-

Prefixes for Colors and Degree: Meanings

<i>meaning</i> few, scanty	<i>meaning</i> black, dark
<i>meaning</i> excess	<i>meaning</i> excessive, above normal
<i>meaning</i> blue	<i>meaning</i> green
<i>meaning</i> all	<i>meaning</i> white

Other Common Prefixes (#1): Word Parts

<i>word part</i> iso-	<i>word part</i> brady-
<i>word part</i> tachy-	<i>word part</i> poikilo-
<i>word part</i> mal-	<i>word part</i> homo-, homeo-
<i>word part</i> neo-	<i>word part</i> hetero-

Other Common Prefixes (#1): Meanings

<i>meaning</i> slow	<i>meaning</i> equal, same
<i>meaning</i> varied; irregular	<i>meaning</i> rapid
<i>meaning</i> same, unchanging	<i>meaning</i> bad
<i>meaning</i> other, different, unequal	<i>meaning</i> new

Other Common Prefixes (#2): Word Parts

<i>word part</i> mega-, megal-	<i>word part</i> re-
<i>word part</i> ante-	<i>word part</i> normo-
<i>word part</i> pseudo-	<i>word part</i> eu-
<i>word part</i> dys-	<i>word part</i> orth-

Other Common Prefixes (#2): Meanings

<i>meaning</i> again; back	<i>meaning</i> large; abnormally large
<i>meaning</i> normal	<i>meaning</i> before
<i>meaning</i> good, normal	<i>meaning</i> false
<i>meaning</i> straight, correct, upright	<i>meaning</i> bad; painful; difficult

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