Medical Terminology and the Reading of Medical English Texts

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Abstracts: The study aims to explicit the importance of medical terminology in reading medical English texts and learn to understand a medical term by word-formation pattern and apply this into reading. By referring to various works and papers about medical terminology and reading medical English texts, their relationship was found. Upon this, word-formation pattern was used to decompound the word parts of medical terms, and the study was concluded with the application of this pattern in reading medical English texts. The study shows that characteristics of medical terminology can help a lot in understanding the complexity of medical terminology. Word-formation pattern enables readers to recognize prefixes, roots, and affixes of medical terminology and decomposed long and discouraging words. Word-formation pattern was useful in the understanding of both medical terminology and medical English texts. It could highly improve learners' efficiency in remembering medical terms and in reading medical English texts.

Keywords: Medical Terminology, Medical English, Texts, Word-Formation Pattern, Affixation.

1. INTRODUCTION

This study deals with the question of how to read medical English texts quickly and fluently by understanding medical terminology. The question is of special interests for medical English reading because words are the foundation for reading comprehension of medical literature. As there are many articles introducing medical terminology, the information covered in this paper is thoroughly illustrated. On the downside, it is not elaborate about how to apply the method we have learned upon medical terminology to reading, and relevant literature in English is limited. The study is divided into four parts. In the first part, the definition of and relationship between medical terminology and medical English texts are introduced. Building on this, three typical characteristics of medical terminology in medical English texts are demonstrated in the second part. The third part focuses on the studying of medical terminology with word-formation pattern. Part four is devoted to the application of knowledge learned from word-formation into reading medical English texts.

This study provides a quick look at medical terminology, including its origin, brief history, characteristics, and learning methods. The aim is to demonstrate the importance of medical terminology in understanding medical English texts.

2. MEDICAL TERMINOLOGY AND MEDICAL ENGLISH TEXTS

Different from normal English words, medical terms have their characteristics, and it is usually hard for beginners to remember these words and their respective meanings. Likewise, medical English texts are not the same texts as we typically read in our daily life. Therefore, readers will be helped to distinguish medical terminology and medical English texts from normal English vocabulary and texts or literature.

2.1. Medical Terminology

Cross & McWay (2020) demonstrated that medical terminology is a language of the healthcare industry, being used by those workers involved in the delivery of patient care, both directly and indirectly. Besides, it is used to describe anatomical structures, procedures, conditions, processes, and treatments. As Banay (1948) put that, "The language of medicine is an idiom foreign to the general speech and of discordant sound", and there is hardly any other type of words that is so depressing for beginners to learn as medical terminology. Although the first impact of

medical words is long and discouraging, once the basic structure, such as the prefixes, roots, and suffixes, and some common word elements like roots are understood, the meaning of thousands of medical terms can be easily grasped.

2.2. Medical English Text

English is the most widely spread language in journals, so it is in medical journals (Wulff, 2004). On the large scale, medical English texts refer to all types of texts written in English. However, the study typically regards medical English papers as medical English texts. Hence, it is of vital importance for any science students hoping to improve their skills to gain the ability to read English texts. Moreover, it is especially the truth for students living in a non-English speaking environment (Salager, 1986).

2.2.1. The Relationship Between Medical Terminology and Medical English Texts

Vocabulary knowledge is of vital significance to reading comprehension. An abundance of research has shown a strong relationship between vocabulary and reading comprehension. This principle is still useful in the work of medical terminology and medical English texts. Undoubtedly, one can't understand a piece of medical text without knowing the meaning of most words and the reader's general vocabulary knowledge determines how well he or she can understand a medical text, which means that lack of adequate professional knowledge will become a serious obstacle for medical learners and professionals. In other words, the larger the number of difficult medical terms, the worse one can understand the meaning of the text.

Being fluent in the medical language can offer a boost to one's healthcare-related career. On one hand, a uniform language can be used across countries to describe the same idea, condition, or instrument to mitigate misunderstandings. On the other, it can improve readers' comprehension of reports and medical literature (Anderson & Freebody, 1981).

2.2.2. Characteristics Of Medical Terminology in Medical English Texts

2.2.2.1. Roots From Greek or Latin Origin

There are three reasons for the widespread of Greek and Latin words as follows.

First, the Greeks were the founders of medical language in the era of Greek civilization from the perspective of medical history. Statistics show that about three-fourths of medical terminology is of Greek origin (Banay, 1948). From the 5th and 4th centuries BC, the oldest written sources of western medicine are the Hippocratic writings, which cover all aspects of medicine at that time and contain numerous medical terms. Later, the classical Greek medical texts were translated into Latin, indicating another age of medical language (Wulff, 2004). The table below shows some common word parts derived from Greek and Latin.

Table 1: Common Word Parts Derived from Greek and Latin from Hull, M. (2013)

Word Part	Origin	Examples (English)
hyper-	From the Greek word *hyper*	hyperactive
hydro-	From the Greek word *hydor*	hydraulic
-ology	From the Greek suffix *-ology*	biology
contra-	From the Latin prefix *contra-*	contraindicated
semi-	From the Latin prefix *semi-*	semicircle

Second, the Greek language is easy to build compounds with other words. During the 18th century, words with Greek endings were used to express new ideas, conditions, or instruments when new terms were needed. These newly created words follow almost the same models used in the past and are hard to distinguish from the old ones. For example, words like *appendicitis*, *creatinine*, *cystoscope*, *epinephrine*, and *streptococcus* are of no difference from the classic ones (Frederick, 1944). Nowadays, not only can many words telling the names of diseases and

symptoms show the origin of Greek and Latin civilization, such as *diarrhea* (throughflow) and *dyspnea* (bad breathing), but also many roots of words can seek a place in the culture.

Third, the classical roots gradually become international and easier to understand than other terms used in other languages, such as Germany and French. Examples of medical terms and the languages from which they derive are seen in the table below.

Table 2: Examples of Medical Terms and Their Language of Origin from Cross N. & McWay D. (2020)

Language of Origin	Medical Terms
French	Masaage/Passage/Plaque/Pipette
Greek	Cardiology/Gastritis/Nephropathia
Italian	Belladonna/Influenza/Varicella
Latin	Cor/Ren/Ventriculus

2.2.2.2. Affixation: Prefixes and Suffixes

Affixation is a morphological process where an affix, is attached to a morphological base. Owing to affixation, human languages could have countless new words and forms. It has several types: prefixes, suffixes, and infixes. Here the former two are discussed in this study.

Prefixes are affixes that precede the root and suffixes are affixes that follow the root. Affixes mark derivation (-er in work-er) and inflection (-s in worker-s).

A prefix is a word part that comes at the beginning of a word. It is noticed that the word *prefix* itself contains a prefix, "*pre-*". The second part of the word prefix is "*fix*", which gives us a perfect definition of prefix: something attached to the front of something else. In medical terms, prefixes are often for size, quantity, location, relationships, or characteristics (Hull, 2013). They are employed for the description of a word. The follow-up table presents some prefixes used in medicine.

Table 3: Prefixes Commonly Used in Medicine from Cross N. & McWay D. (2020)

Prefix	Definition	Word Example
a-, an-	no, not, without, lack of, apart	Anoxia
ad-	toward, near, to	Adhesion
bi-	two, double	Bicuspid
de-	down, away from	Degenerate
di-	two, double	Diplopia
dia-	through, between	Dialysis
dif-, dis-	apart, free from, separate	Diffusion
dys-	bad, difficult, painful	Dysfunctional
ec-, ecto-	out, outside, outer	Ectoderm
end-, endo-	within, inner	Endometrium
ep-, epi-	upon, over, above	Epidural
ex-, exo-	out, away from	Excrete
extra-	outside, beyond	Extrauterine

A suffix is a word part that comes at the end of a word. The word *suffix* itself is rooted in a Latin word, "*suffixum*", which means "to fasten to the end of". In medical terms, the definition of a word comes first with the suffix even though it is the last part. For example, the term *gastrectomy* ends with the suffix "*-ectomy*", but the whole word means "the removal of the stomach" (Nath & Lindsley, 2019). For more suffix examples, see table 4 below.

Table 4: Suffixes That Signify Medical Conditions from Nath, L. J. & Lindsley P. K. (2019)

Suffix	Meaning of the Suffix	Example	Meaning of the Example
-algia	Pain	arthralgia	pain in a joint
-cele	Protrusion	rectocele	hernia of the rectum
-cyte	Cell	leukocyte	white blood cell
-ectasis	Expansion	angiectasis	dilation of a vessel

-emia	Blood	uremia	urea in the blood

2.2.2.3. Abbreviations and Acronyms

An abbreviation is the amalgamation of parts of different words. It has in common with truncation and is similar to blends in nature (Plag, 2002). Some abbreviations are considered acronyms, which refer to the initial letters of words. These letters are combined in a sequence and sometimes pronounced as a single word. Healthcare professionals use abbreviations frequently in their daily work so as to communicate succinctly. Using abbreviations or acronyms in the healthcare industry can improve work efficiency and workflow, making more work within the limited time possible (Cross & McWay, 2020). They are used for various purposes. Take *X-ray*, for example, it is the abbreviation of *radiology*, and it is used for medical service. For more abbreviations, see Table 5.

Table 5: Abbreviations and their purposes from Cross N. & McWay D. (2020)

Abbreviation	Definition	Purpose
A&D	admitting and discharging	for services
HPI	history of present illness	used in health records
qd	once a day	for frequencies
tabs.	tablets, pills	for units of measure
reg	regular diet	for diet orders
OOB	out of bed	for activity and toiletry
MRI	magnetic resonance imaging	for laboratory tests
EEG	electrocardiogram	for miscellaneous terms

2.3. Studying Medical Terminology with The Word-Formation Pattern

The written texts above show that countless roots, and affixes, both prefixes and suffixes can be found in medical terms. Namely, medical terminology is composed of these word parts. Here in this part, we will study medical terminology with word-formation. Three main forms of word-formation are characteristic of English: derivation, compounding, and conversion (Gairns & Redman, 1998). The next following passages will discuss the former two methods used in the formation of medical terminology.

2.3.1. Word-Formation: Derivation

Medical terminology is constructed systematically. These terms are usually derived from a combination of prefixes, roots, and suffixes. As we have illustrated above, not all but many medical terms are the results of combining Latin or Greek word parts due to the prevalence of these civilizations in the past. Sometimes, it needs a combining vowel to form a medical word. Usually, it is an “o” and occasionally an “i” inserted between compound word roots or between a word root and a suffix for pronunciation purposes (Cross & McWay, 2020). Take the word “*hemorrhage*” for example, “*hem/o*” represents root word and combining vowel and “*-rrhage*”is the suffix. If the suffix begins with a vowel (usually an “i”), the combining vowel on the root is dropped. Table 6 shows us some forms of medical terms with at least two parts.

Table 6. Parts of a Medical Term- word root

Word Parts	Examples	Medical Terms
prefix + root*	anti- + thyroid	Antithyroid
root + suffix	gastr + -ic	Gastric
prefix + suffix	an- + -emia	Anemia
prefix + root + suffix	epi- + gastr + -algia	Epigastralgia
combining form + suffix	cardi + /o + -logy	Cardiology

2.3.2. Word-formation: Compounding

Compound words are two or more root words jointed with a combining vowel. A word root cannot directly join to a suffix or to other root words to make a compound word, it needs the participation of a combining vowel. Table 7 lists some compound words with their meanings in the cardiovascular, musculoskeletal, and neurological systems.

(Here, only three systems are presented. For more, see *Medical Language Terminology in Context* by Hull Melodie.)

Table 7:Compound Words in the Cardiovascular System from Hull, M. (2013)

Root	Medical Term	Medical Meaning
arterio + rrhexis	arteriorrhexis	rupture of an artery
arterio + rrhaph + y	arteriorrhaphy	suture of an artery
arteriolo + necr + osis	arteriolonecrosis	the death of an arteriole
ven + ectas + ia	venectasia	the dilation of a vein
veno + stasis	venstasis	the trapping of blood

Table 8: Compound Words in the Musculoskeletal and Neurological Systems from Hull, M. (2013)

Root	Medical Term	Medical Meaning
meningo + cele	meningocele	a protrusion of the meninges
para + hypn/os + osis	parahypnosis	abnormal sleep
para + somnia	parasomnia	an abnormal event in sleep
en + cephalon + gram	encephalogram	a radiograph of the brain
dys + bas + ia	dysbasia	difficulty walking

3. APPLICATION OF WORD-FORMATION PATTERNS INTO READING MEDICAL ENGLISH TEXTS.

3.1. Guessing of Medical Terminology

As is illustrated above, medical terms consist of three basics, and each part has a specific meaning. How these parts are connected with each other determines the word's meaning. If the affix or root is changed, so is the meaning. For example, *phlebotomy* is the combination of "*phleb/o*" (word root) and "*-tomy*" (suffix), which means the incision of a vein. However, the word *phlebectomy* (the removal of a vein) is the replacement of the suffix "*-tomy*" for "*-ectomy*", meaning totally different. From this simple example, we can see that the word-formation pattern helps a lot in understanding the meaning of medical terminology. If readers encounter an unfamiliar medical term, try to decompose the word, specify its prefix(es), root(s), or suffix(ex), and then, it may become easier to understand its meaning. For example, the word *intracerebroventricular* can be decomposed to three parts: *intra, cerebro, ventricular*. What needs deep focus is that learners need to be careful enough at the beginning to distinguish differences from similar word parts and pay attention to such words as *ilium* and *ileum*, which pronounce exactly the same.

3.2. Contextual Understanding of Medical Terminology

Sometimes, it is hard to confirm the meaning of a word just based on its roots and affixation. On this occasion, the context will help a lot. Readers can "make use of the context to derive an idea of its meaning, or in some cases to guess from the word itself" (Gairns & Redman, 1998). The following examples will provide further explanation by comparing the word *colon* and *inspiration* in different contexts.

(1)*. Here, too, the *colon* must be followed by a dash.

In this context, the word "*colon*" refers to a mark.

(2). Paraduodenal hernias are thought to occur because of anomalies in fixation of the mesentery of the ascending or descending *colon*.

In this context, the word "*colon*" refers to the main part of the large intestine.

(3). Dreams can be a rich source of *inspiration* for an artist.

In this context, the word "*inspiration*" refers to the feeling to create something in art.

(4). During *inspiration*, human beings breathe in oxygen.

In this context, the word "*inspiration*" refers to breathing.

*These sentences are extracted from the Oxford Advanced Learner's English-Chinese Dictionary. 9th edition.

Hence, readers cannot fully understand the meaning of a word without its context. Misunderstandings or even mistakes would be made if a word is deprived of its context. Besides, the word-formation method alone cannot assure the full delivery of meanings. That is to say, it will function and amplify its advantages as much as possible if contexts are taken into consideration.

DISCUSSION AND CONCLUSION

This study has discussed the characteristics and relationship between medical terminology and the reading of medical English texts. It is concluded in part four on the application of the word-formation pattern into reading comprehension. Undoubtedly, having a good command of medical terminology understanding will contribute to medical English reading. With the rules of word-building method, the process would be especially easy.

However, there are still limitations. First, it seems impossible to learn and remember all medical roots and affixations. Second, some word parts originate from classic Greek and Latin languages, which load up learners' burden. Third, grasping one vocabulary strategy (here refers to word building strategy) is not enough, other means should also be included in future papers. Further discussions may be prospective if such limitations are removed.

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