AL ANDALUS UNIVERSITY
FOR MEDICAL SCIENCES

Faculty of Medical Eng.
First Year
Medical Terminology –1

AU SYRIA
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جامعة الأندلس
الخاصة للعلوم الطبية

كلية الهندسة الطبية
السنة الأولى
مصطلحات طبية -1

First Lecture

1. Basic elements of the medical word

1.1. Medical word elements[2]

The language of medicine is a specialized vocabulary used by health care practitioners. Many current medical word elements originated as early as the 1st century B.C., when Hippocrates[3] practiced medicine. With advancements in medicine, new terms have evolved to reflect these innovations. For example, radiographic terms, such as magnetic resonance imaging (MRI) and ultrasound (US), are now used to describe current diagnostic procedures.

A medical word consists of some or all of the following elements: word root, combining form, suffix, and prefix. How you combine these elements, and whether all or some of them are present in a medical term, determines the meaning of a word. The purpose of this lecture is to help you identify these elements in order to construct medical terms correctly.

1.1.1. Word roots

A word root is the foundation of a medical term and contains its primary meaning. All medical terms have at least one word root. Most word roots are derived from Greek or Latin language. 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 words that describe a disease, condition, treatment, or diagnosis. Latin roots are used to build words 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

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[2] Medical Terminology Systems - A Body Systems Approach: Basic elements of a medical word – Medical word elements p. 2
[3] Hippocrates: /hɪˈpɒkrəˌtiːz/ a Greek physician 460-377 b.c, ("Father of Medicine")

Latin root cutane is used primarily to describe an anatomical structure. (See *Table 1-1*).

1.1.2. 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 "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 word. In this text, a combining form will be listed as word root/vowel (such as gastr/o), as illustrated in *Table 1-2*.

Table 1-1: Examples of word roots as well as their phonetic pronunciations

English Term	Greek/Latin Term	Word Root	Word Analysis /Pronunciation[4]/ (Arabic[5])
skin	dermatos (Gr) cutis (L)	dermat cutane	dermat/itis: /ˌdɜːməˈtaɪtɪs/ inflammation of the skin A term that describes a skin disease (اِلْتِهابُ الجِلْد) cutane/ous: /kjuˈteɪniəs/ pertaining[6] to the skin A term that describes an anatomical structure (جِلْدِيّ)
kidney	nephros (Gr) renes (L)	nephr ren	nephr/oma: /nəfrəʊˈmə/ tumour of the kidney A term that describes a kidney disease (وَرَمٌ كُلْوِيّ) ren/al: /ˈriːnl/ pertains to the kidney A term that describes an anatomical structure (كُلْوِيّ)
mouth	stomatos (Gr) oris (L)	stomat or	stomat/itis: /ˌstəʊməˈtaɪtɪs; ˌstɒm-/ inflammation of the mouth A term that describes any inflammatory condition of the mouth (اِلْتِهابُ الفَم) or/al: /ˈɔːrəl/ pertaining to the mouth A term that describes an anatomical structure (فموِيّ)

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[4] Oxford Advanced Lerner's Dictionary, 8th ed. or: http://dictionary.reference.com/
[5] http://www.emro.who.int/Unified-Medical-Dictionary.html
[6] Pertain to: /pəˈteɪn/ to be connected with sth/sb

Table 1-2: Illustration of how word roots and vowels create combining forms

Word Root + Vowel =	Combining Form	Pronunciation	Meaning
erythr/ + o =	erythr/o	ɪˈrɪθr	red
gastr/ + o =	gastr/o	ˌɡæstr	stomach
hepat/ + o =	hepat/o	ˌhepət	liver
immun/ + o =	immun/o	ɪˈmjuːn	immune, immunity, safe
nephr/ + o =	nephr/o	nefr	kidney
oste/ + o =	oste/o	ˈɒsti	bone

1.1.3. Suffixes

A suffix is a word element placed at the end of a word that changes the meaning of the word. In the terms tonsill/itis, and tonsill/ectomy, the suffixes are -itis (inflammation) and -ectomy (excision[7], removal). Changing the suffix changes the meaning of the word. In medical terminology, a suffix usually describes a pathology[8] (disease or abnormality), symptom[9], surgical or diagnostic[10] procedure, or part of speech. Many suffixes are derived from Greek or Latin words. (See *Table 1-3*).

Table 1-3: Examples of pathological suffixes as well as their phonetic pronunciations

Combining Form + Suffix =	Medical Word	Pronunciation	Meaning (Arabic)
gastr/o + -itis = (stomach) (inflammation)	gastritis	gæˈstraɪtɪs	inflammation of the stomach (التِهابُ المَعِدَة)
gastr/o + -megaly = (stomach) (enlargement)	gastromegaly	gæˈstrəʊmegæli	enlargement of the stomach (ضخامة المَعِدَة)
gastr/o + -oma = (stomach) (tumour)	gastroma	gæˈstrəʊmə	tumour of the stomach (ورم المعدة)
hepat/o + -itis = (liver) (inflammation)	hepatitis	ˌhepəˈtaɪtɪs	inflammation of the liver (التِهابُ الكبد)
hepat/o + -megaly = (liver) (enlargement)	hepatomegaly	ˌhepətəʊˈmegəli	enlargement of the liver (ضخامة الكبد)
hepat/o + -oma = (liver) (tumour)	hepatoma	ˌhepəˈtəʊmə	tumour of the liver (ورم الكبد)

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[7] Excision: /ɪkˈsɪʒn/ the act of removing sth completely from sth; the thing removed
[8] pathology: /pəˈθɒlədʒi/ the scientific study of diseases
[9] Symptom: /ˈsɪmptəm/ a change in your body or mind that shows that you are not healthy
[10] Diagnostic: /ˌdaɪəgˈnɒstɪk/ connected with identifying sth, especially an illness

1.1.4. 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. The prefix usually indicates a number, time, position, direction, or negation. Many of the same prefixes used in medical terminology are also used in the English language. (See *Table 1-4*).

Table 1-4: Examples of prefixes as well as their phonetic pronunciations

Prefix + Word Root + Suffix =	Medical Word	Pronunciation	Meaning (Arabic)
an- + esthes + -ia = (without ,not) (feeling) (condition)	anaesthesia (anesthesia)	ˌænəsˈθiːziə	condition of not feeling (تخدير)
hyper- + therm + -ia = (excessive, (heat) (condition) above normal)	hyperthermia	ˌhaɪpəˈθɜːmiə	condition of excessive heat (فَرْطُ الحرارة)
intra- + muscul + -ar = (in, within) (muscle) (pertaining to)	intramuscular	ˌɪntrəˈmʌskjələ(r)	pertaining to within the muscle (داخِل العَضَل)
para- + nas + -al = (near, beside) (nose) (pertaining to; beyond)	paranasal	ˌpærəˈneɪzl	pertaining to (area) near the nose (مُجَاوِرٌ للأَنْف)
poly- + ur + -ia = (many, much) (urine) (condition)	polyuria	ˌpɒliˈjʊəriə	condition of much urine (بُوال)

1.2. Basic guidelines

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

1.2.1. Defining medical words

Here are three basic steps for defining medical words using gastroenteritis[11] as an example.

1. Define the suffix, or last part of the word. In this case, the suffix -itis, which means inflammation.
2. Define the first part of the word (which may be a word root, combining form, or prefix). In this case, the combining form gastr/o means stomach.

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[11] Gastroenteritis: /ˌgæstrəʊˌentəˈraɪtɪs/ an illness of the stomach and other food passages that causes diarrhoea /ˌdaɪəˈrɪə/ and vomiting

3. Define the middle parts of the word. In this case, the word root enter means intestine[12]. When you analyse gastroenteritis following the three previous rules, the meaning is:

1. inflammation (of)
2. stomach (and)
3. intestine.

Thus, the meaning of gastroenteritis is inflammation (of) stomach (and) intestine. *Table 1-5)* illustrates this process.

Table 1-5: Three steps of defining a medical word using the example "gastroenteritis"

Combining Form	Middle	Suffix
gastr/o (stomach) (step 2)	enter/ (intestine) (step 3)	-itis (inflammation) (step 1)

1.2.2. Building medical words

There are three basic rules for building medical words.

Rule #1
A word root links a suffix that begins with a vowel.

Rule #2
A combining form (root + o) links a suffix that begins with a consonant.

Rule #3
A combining form links a root to another root to form a compound word. This rule holds true even if the next root begins with a vowel, as in osteoarthritis. Keep in mind that the rules for linking multiple roots to each other are slightly different from the rules for linking roots and combining forms to suffixes. (See *Table 1-6*).

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[12] intestine: /ɪnˈtestɪn/ a long tube in the body between the stomach and the anus /ˈeɪnəs/

Table 1-6: Examples of rules 1, 2 and 3

Word Root + Suffix =	Medical Word	Pronunciation	Meaning (Arabic)
hepat + -itis = (liver) (inflammation)	hepatitis	ˌhepəˈtaɪtɪs	inflammation of the liver (التهاب الكبد)
Combining Form + Suffix =	Medical Word	Pronunciation	Meaning (Arabic)
hepat/o + -cyte = (liver) (cell)	hepatocyte	ˈhepətəˌsaɪt	liver cell (خلية كبدية)
Combining Form + Word Root + Suffix =	Medical Word	Pronunciation	Meaning (Arabic)
oste/o + chondr + -itis = (bone)(cartilage)(inflammation)	osteochondritis	ˌɒstiəʊkɒnˈdraɪtɪs	inflammation of bone and cartilage (التهاب العظم والغضروف)
oste/o + arthr + -itis = (bone) (joint) (inflammation)	osteoarthritis	ˌɒstiəʊɑːˈθraɪtɪs	inflammation of bone and joint (فُصال عظميّ)