

## Third Lecture

### 3. Suffixes (Cont'd)

#### *Summary of previous lectures*

*In the previous lectures we talked about the basic elements of the medical word: word root, combining form, suffix, and prefix. The meaning of a word is determined by how these elements are combined. Detailed information about suffixes is mentioned. Suffix linking and suffix types are explained in detail and many examples related to the surgical, diagnostic and pathological suffixes are also provided.*

#### 3.1.1. Surgical, diagnostic, pathological, and related suffixes (Cont'd)

Table 3-1: Commonly used diagnostic, pathological, and related suffixes along with their meanings and word analyses

Suffix (Meaning)	Word (Arabic <sup>30</sup> )	Pronunciation <sup>31</sup>	Analysis
Diagnostic			
-gram (record, writing)	electr/o/cardi/o/gram (مَحْطَطُ كَهْرَبِيَّةِ الْقَلْبِ)	ɪˌlektɹəʊˈkɑːdiəʊ- græm	record of the electrical activity of the heart electr/o: electricity cardi/o: heart
-graph (instrument for recording)	cardi/o/graph (مِحْطَاطُ الْقَلْبِ)	kɑːdiˈɒgrəf	instrument for recording electrical activity of the heart cardi/o: heart
-graphy (process of recording)	angi/o/graphy (تصوير الأوعية)	ˌændʒiˈæʊgrəfi	process of recording blood vessels angi/o: vessel (usually blood or lymph) Angiography is the radiographic imaging of blood vessels after injection of a contrast <sup>32</sup> medium.

<sup>30</sup> <http://www.emro.who.int/Unified-Medical-Dictionary.html>

<sup>31</sup> Oxford Advanced Learner's Dictionary, 8<sup>th</sup> ed. or: <http://dictionary.reference.com/>

<sup>32</sup> Contrast: /'kɒntrɑːst/ differences in colour or in light and dark

-meter (instrument for measuring)	pelv/i/meter <sup>33</sup> (مِقْيَاسُ الحَوْضِ)	'pelvi'mi:tə(r)	instrument for measuring the pelvis <sup>34</sup> pelv/i: pelvis
-metry (act of measuring)	pelv/i/metry (مِقْيَاسُ الحَوْضِ)	pel'vimitri	act or process of measuring the dimension of the pelvis pelv/i: pelvis
-scope (instrument for examining)	endo/scope (مِنْظَرٌ دَاخِلِيّ)	'endəskəʊp	instrument for examining within endo-: in, within 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 (تَنْظِيرٌ دَاخِلِيّ)	en'dɒskəpi	visual examination within endo-: in, within Endoscopy is performed to visualize a body cavity or canal using a specialized lighted instrument called an endoscope.

Table 3-1: Cont'd

Suffix (Meaning)	Word (Arabic)	Pronunciation	Analysis
Pathological and Related			
-algia (pain)	neur/algia (أَلَمٌ عَصَبِيّ)	njʊə'rældʒə	pain of a nerve neur: nerve The pain of neuralgia usually occurs along the path of a nerve.
-dynia	ot/o/dynia (أَلَمُ الأذُنِ)	əʊtə'dɪniə	pain in the ear; earache <sup>35</sup> ot/o: ear
-cele (hernia, swelling)	hepat/o/cele (قَبِيلَةٌ كَبِدِيَّة)	hi'pætəsi:l	hernia <sup>36</sup> of the liver hepat/o: liver

<sup>33</sup> 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

<sup>34</sup> Pelvis: /'pelvɪs/ the wide curved set of bones at the bottom of the body that the legs and spine are connected to

<sup>35</sup> Earache: /'ɪərəɪk/ pain inside the ear

<sup>36</sup> Hernia: /'hɜ:niə/ a medical condition in which part of an organ is pushed through a weak part of the body wall

-ectasis (dilation, expansion)	bronchi/ectasis (تَوَسُّعُ الْقَصَبَاتِ)	ˌbrɒŋkɪˈektəsis	dilation or expansion of one or more bronchi bronchi: bronchus <sup>37</sup> (plural, bronchi) Bronchiectasis is associated with various lung conditions and is commonly accompanied by chronic infection.
-edema (swelling)	lymph/edema (وَدَمَةٌ لِمْفِيَّةٌ)	ˌlɪmfɪˈdi:mə	swelling and accumulation of tissue fluid lymph: lymph Lymphedema may be caused by a blockage of the lymph vessels.
-emesis (vomiting)	hyper/emesis (فَيْءٌ مُفْرِطٌ)	haɪpəˈemɪsɪs	excessive vomiting hyper-: excessive, above normal
-emia (blood condition)	an/emia (فَقْرُ الدَّمِ)	əˈni:mɪə	blood condition caused by a decrease in red blood cells (erythrocytes) an-: without, not
-gen (forming, producing, origin)	carcin/o/gen (مُسَرِّطِنٌ)	kɑːˈsɪnədʒən	forming, producing, or origin of cancer carcin/o: cancer A carcinogen is a substance or agent, such as cigarettes, that causes the development or increases the incidence of cancer.
-genesis	carcin/o/genesis (التَّسَرِّطِنُ)	ˌkɑːsɪnəʊˈdʒenəsɪs	forming or producing cancer carcin/o: cancer 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 <sup>38</sup> (تَحَصُّنٌ صَفْرَاوِيٌّ)	ˌkəʊləlɪˈθaɪəsɪs	abnormal condition of gallstones chol/e: bile, gall lith: stone, calculus Cholelithiasis is the presence or formation of gallstones in the gallbladder or common bile duct.
-itis (inflammation)	gastr/itis (الْتِهَابُ الْمَعِدَّةِ)	ɡæˈstraɪtɪs	inflammation of the stomach gastr: stomach

<sup>37</sup> Bronchus: /ˈbrɒŋkəs/ (pl. bronchi /ˈbrɒŋkaɪ/) any one of the system of tubes which make up the main branches of the windpipe through which air passes in and out of the lungs

<sup>38</sup> 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

-lith (stone, calculus)	chol/e/lith (حَصَاةٌ صَفْرَاوِيَّةٌ)	'kəʊləɪθ	gallstone chol/e: bile, gall
-malacia (softening)	chondr/o/malacia (تَلَيُّنُ العُضْرُوفِ)	ˌkɒndrəʊmə'leɪʃə	softening of the articular cartilage <sup>39</sup> , usually involving the patella chondr/o: cartilage
-megaly (enlargement)	cardi/o/megaly (تَضَخُّمُ القَلْبِ)	ˌkɑ:diəʊ'megəli	enlargement of the heart cardi/o: heart
-oma (tumour)	neur/oma (وَرْمٌ عَصَبِيٌّ)	njʊə'rəʊmə	tumour composed of nerve tissue neur: nerve A neuroma is a benign <sup>40</sup> tumour composed chiefly of neurons and nerve fibres, 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 (زُرَاقٌ)	ˌsaɪə'nəʊsɪs	dark blue or purple discoloration of the skin and mucous <sup>41</sup> membrane cyan: blue Cyanosis indicates a deficiency of oxygen in the blood.
-pathy (disease)	my/o/pathy (اعْتِلَالٌ عَضَلِيٌّ)	maɪ'əʊpəθi	disease of muscle my/o: muscle
-penia (decrease, deficiency)	erythr/o/penia (قِلَّةُ الكُرَيَاتِ الحُمْرِ)	ɪˌrɪθrəʊ'pi:niə	decrease in red blood cells erythr/o: red
-phagia (eating, swallowing)	dys/phagia (عُسْرُ البَلْعِ)	dɪs'feɪdʒiə	inability or difficulty in swallowing dys-: bad; painful; difficult
-phasia (speech)	a/phasia (حُبْسَةٌ)	ə'feɪziə	absence or impairment of speech a-: without, not
-phobia (fear)	hem/o/phobia (رُهَابُ الدَّمِ)	ˌhi:mə'fəʊbiə	fear of blood hem/o: blood

<sup>39</sup> Cartilage: /'kɑ:ɪlɪdʒ/ the strong white tissue that is important in support and especially in joints to prevent the bones rubbing against each other

<sup>40</sup> Benign: /bɪ'nɑɪn/ (of tumours growing in the body) not dangerous or likely to cause death

<sup>41</sup> Mucous: /'mju:kəs/ a thick liquid that is produced in parts of the body, such as the nose, by a mucous membrane

-plasia (formation, growth)	dys/plasia (خَلْلُ النَّسْجِ)	dɪs'pleɪziə	abnormal formation or growth of cells, tissues, or organs dys-: bad; painful; difficult Dysplasia is a general term for abnormal formation of an anatomic structure.
-plasm	neo/plasm (تَنْسُؤُ)	'ni:əʊ,plæzəm	new formation or growth of tissue neo-: new A neoplasm is an abnormal formation of new tissue, such as a tumour or growth.
-plegia (paralysis)	hemi/plegia (شَلْلٌ نِصْفِيٌّ)	ˌhemɪ'pli:dʒɪə	paralysis of one side of the body hemi-: one half Hemiplegia affects the right or left side of the body and is usually caused by a brain injury or stroke.
-ptosis (prolapse <sup>42</sup> , downward displacement)	blephar/o/ptosis (إِطْرَاق)	'blefərəʊp'təʊsɪs	drooping <sup>43</sup> of the upper eyelid blephar/o: eyelid
-rrhage (bursting forth (of))	hem/o/rrhage (نَزْفٌ)	ˌhemə'rɪdʒ	bursting forth (of) blood hem/o: blood Haemorrhage refers to a loss of a large amount of blood within a short period, either externally or internally.
-rrhagia	men/o/rrhagia (غَزَاةُ الطَّمْثِ)	ˌmenɔ:'reɪdʒɪə	profuse <sup>44</sup> discharge of blood during menstruation <sup>45</sup> men/o: menses, menstruation
-rrhea (discharge, flow)	dia/rrhea (إِسْهَالٌ)	ˌdaɪə'rɪə	abnormally frequent discharge or flow of fluid faecal <sup>46</sup> matter from the bowel <sup>47</sup> dia-: through, across
-rrhexis (rupture)	arteri/o/rrhexis (تَمَرُّقُ الشِّرْيَانِ)	ɑ:ˌtɪəriəʊ'reksɪs	rupture of an artery arteri/o: artery

<sup>42</sup> Prolapse: /'prələʊps/ a condition in which an organ of the body has slipped forward or down from its normal position

<sup>43</sup> Droop: /dru:p/ to bend, hang or move downwards, especially because of being weak or tired

<sup>44</sup> Profuse: /prə'fju:s/ produced in large amounts

<sup>45</sup> Menstruation: /ˌmenstru'eɪʃn/ the process or time of menstruating (menstruate /'menstrueɪt/ a flow of blood from a woman's womb, usually once a month)

<sup>46</sup> Faecal: faeces: /'fi:si:z/ (adj. faecal (AmE: fecal) /'fi:kl/) solid waste material that leaves the body through the anus

<sup>47</sup> Bowel: /'bəʊəl/ the tube along which food passes after it has been through the stomach, especially the end where waste is collected before it is passed out of the body

-sclerosis (abnormal condition of hardening)	arteri/o/sclerosis (تصلُّبُ الشَّرَائِينِ)	ɑ: tɪəriəʊ- sklə'rəʊsɪs	abnormal condition of hardening of an artery arteri/o: artery
-spasm (involuntary contraction, twitching)	blephar/o/spasm (تَشَنُّجُ الجَفْنِ)	'blefərəʊ spæzəm	twitching of the eyelid blephar/o: eyelid
-stenosis (narrowing, stricture)	arteri/o/stenosis (تَضْيِيقُ الشَّرِيَانِ)	ɑ: tɪəriəʊstɪ'nəʊsɪs	abnormal narrowing of an artery arteri/o: artery
-toxic (poison)	hepat/o/toxic (سَامٌّ لِلْكَبِدِ)	hepətəʊ'tɒksɪk	poisonous to the liver hepat/o: liver
-trophy (nourishment, development)	dys/trophy (حَتَلٌ)	'dɪstrəfi	bad nourishment dys-: bad; painful; difficult Dystrophy is an abnormal condition caused by improper nutrition or altered metabolism.

## 3.2. Suffix types<sup>48</sup>

An effective method in mastering medical terminology is to learn the major types of suffixes in categories. By grouping the surgical, diagnostic, pathological, related, as well as grammatical suffixes, they will be easier to remember.

### 3.2.1. 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 words. They are also used to denote a diminutive<sup>49</sup> form, or smaller version, of a word (e.g. tubule, which means a small tube). Many of these same suffixes are used in the English language. (See [Table 3-2](#)).

Table 3-2: Adjective, noun, and diminutive suffixes along with their meanings and word analyses

Suffix (Meaning)	Word (Arabic)	Pronunciation	Analysis
Adjective			
-ac (pertaining to)	cardi/ac (قلبي)	'kɑ:diæk	pertaining to the heart cardi: heart
-al	neur/al (عصبي)	'njʊərəl	pertaining to a nerve neur: nerve

<sup>48</sup> Medical Terminology Systems - A Body Systems Approach: Suffixes – Suffix types p. 15

<sup>49</sup> Diminutive: /di'mɪnjətɪv/ very small

-ar	muscul/ar (عَضَلِي)	'mʌskjələ(r)	pertaining to muscle muscul: muscle
-ary	pulmon/ary (رئوي)	'pʌlmənəri	pertaining to the lungs pulmon: lung
-eal	esophag/eal (مَرِيئِي)	i,sɒfə'dʒiəl	pertaining to the oesophagus esophag: oesophagus (esophagus)
-ic	thorac/ic (صَدْرِي)	θɔ:'ræsi:k	pertaining to the chest thorac: chest
-ical <sup>50</sup>	path/o/log/ical (مَرَضِي)	,pæθə'lɒdʒɪkəl	pertaining to the study of disease path/o: disease log: study of
-ile	pen/ile (قَضِيئِي)	'pi:naiəl	pertaining to the penis pen: penis
-ior	poster/ior (خَلْفِي)	pə'stiəriə(r)	pertaining to the back of the body poster: back (of body), behind, posterior
-ous <sup>51</sup>	cutane/ous (جِلْدِي)	kju'teɪniəs	pertaining to the skin cutane: skin
-tic	acous/tic (سَمْعِي)	ə'ku:stɪk	pertaining to hearing acous: hearing
<b>Noun</b>			
-esis (condition)	di/ur/esis (إِنْدْرَارُ الْبَوْلِ)	,daɪjʊ'reɪsɪs	abnormal secretion of large amounts of urine di-: double ur: urine
-ia	pneumon/ia (الْتِهَابُ رِئَوِي)	nju:'mæʊniə	infection of the lung usually caused by bacteria, viruses, or diseases pneumon: air; lung
-ism	hyper/thyroid/ism (فَرْطُ الدَّرَقِيَّةِ)	,haɪpə'θaɪrɔɪdɪzəm	condition characterized by over-activity of the thyroid gland hyper-: excessive, above normal thyroid: thyroid gland
-iatry (medicine; treatment)	pod/iatry (مَبْحَثُ الْأَقْدَامِ)	pə'daɪətri	specialty concerned with treatment and prevention of conditions of the feet pod: foot

<sup>50</sup> The suffix -ical is a combination of -ic and -al

<sup>51</sup> The suffix -ous also means composed of or producing

-ician (specialist)	obstetr/ician (طَبِيبٌ مُوَدِّد)	ˌɒbstəˈtrɪʃn	physician who specializes in the branch of medicine concerned with pregnancy and childbirth obstetr: midwife <sup>52</sup>
-ist	hemat/o/log/ist (اِخْتِصَاصِيُّ الدَّمَوِيَّات)	ˌhi:məˈtɒlədʒɪst	physician who specializes in the treatment of disorders of blood and blood-forming tissues hemat/o: blood log: study of
-y (condition; process)	neur/o/path/y (اِعْتِلَالٌ عَصَبِي)	njʊˈrɒpəθi	disease condition of the nerves neur/o: nerve path: disease
Diminutive			
-icle (small, minute)	ventr/icle (بُطَيْن)	ˈventrɪkl	small cavity, as of the brain or heart ventr: belly, belly side
-ole	arteri/ole (شُرَيْرِين)	ɑːˈtɪəriəʊl	the smallest of the arteries; minute artery arteri: artery Arteries narrow to form arterioles (small arteries), which branch into capillaries (the smallest blood vessels).
-ule	ven/ule (وَرِيد)	ˈvenju:l	small vein continuous with a capillary ven: vein

### 3.2.2. Plural suffixes

Many medical words 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. A summary of the rules for changing a singular word into its plural form is shown in [Table 3-3](#).

<sup>52</sup> Midwife: /ˈmɪdwaɪf/ (pl. midwives /ˈmɪdwaɪvz/) a person, especially a woman, who is trained to help women give birth to babies

Table 3-3: Common singular suffixes, the rules for forming plurals, and examples of each

Rule		Example	
Singular	Plural	Singular	Plural
-a	Retain a and add e	pleura <sup>53</sup>	pleurae
-ax	Drop x and add ces	thorax <sup>54</sup>	thoraces
-en	Drop en and add ina	lumen <sup>55</sup>	lumina
-is	Drop is and add es	diagnosis	diagnoses
-ix	Drop ix and add ices	appendix	appendices
-ex	Drop ex and add ices	apex <sup>56</sup>	apices
-ma	Retain ma and add ta	carcinoma <sup>57</sup>	carcinomata
-on	Drop on and add a	ganglion <sup>58</sup>	ganglia
-um	Drop um and add a	bacterium	bacteria
-us	Drop us and add i	bronchus	bronchi
-y	Drop y and add ies	deformity	deformities

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<sup>53</sup> Pleura: /'plʊərə/ (pl. pleurae /'plʊəri:/) one of the two membranes that surround the lungs

<sup>54</sup> Thorax: /θɔræks/ the part of the body that is surrounded by the ribs, between the neck and the waist

<sup>55</sup> Lumen: /'lu:mɪn/ the inner open space or cavity of a tubular organ, as of a blood vessel

<sup>56</sup> Apex: /'eɪpeks/ the tip, point, or vertex; summit

<sup>57</sup> Carcinoma: /,kɑ:sɪ'nəʊmə/ a cancer that affects the top layer of the skin or the lining of the body's internal organs

<sup>58</sup> Ganglion: /'gæŋgliən/ a mass of nerve cells