

Tenth Lecture

10. Respiratory system (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, pathological, grammatical and plural suffixes are also provided. Detailed information about prefixes is also mentioned. Prefix linking and prefix types are explained in detail and many examples related to different types of prefixes are provided.

The basic structural and functional organization of the body from the cellular level to the organism level is also presented. Additionally, terms used to describe planes of the body, body cavities, quadrants and regions of the abdominal cavity, and divisions of the spinal column are presented. These terms are considered as an essential part of medical terminology and are used in all body systems. We moved on to talk about the body systems in detail.

Starting with the digestive system, also called the gastrointestinal (GI) system, it is mentioned that it consists of a digestive tube called the GI tract or alimentary canal, and several accessory organs whose primary function is to break down food, prepare it for absorption, and eliminate waste. The GI tract, extending from the mouth to the anus, varies in size and structure in several distinct regions. Many terms related to the digestive system are also introduced.

Next, we talked about the respiratory system and how it is responsible for the exchange of oxygen (O₂) and carbon dioxide (CO₂). Oxygen is carried to all cells of the body in exchange for CO₂, a waste product. The cardiovascular system helps in this vital function by providing blood vessels for carrying these gases. Failure or

deficiency in either system has the same effect on the body: disturbance of homeostasis and O₂ starvation in tissues that may cause death.

10.1. Introduction

In “Respiratory system”, we talked about the anatomy and physiology of the respiratory system, focusing on the key terms related to the anatomy and physiology of this system. In addition, the upper and lower respiratory tracts are explained. In this lecture, the respiration process and some medical word elements related to the respiratory system are introduced.

10.2. Anatomy and Physiology

10.2.1. Respiration²⁰³

Respiration is the overall process by which O₂ is taken from air and carried to body cells for their use, while CO₂ and water, the waste products generated by these cells, are returned to the environment. Respiration includes four separate processes:

- pulmonary ventilation, more commonly called breathing, which is a largely involuntary action that moves air into (inspiration) and out of (expiration) the lungs in response to changes in blood O₂ and CO₂ levels and nervous stimulation of the diaphragm and intercostal²⁰⁴ muscles
- external respiration, which is the exchange of oxygen and carbon dioxide between the alveoli and the blood in the pulmonary capillaries
- transport of respiratory gases, which occurs when blood, aided by the cardiovascular system, transports CO₂ to the lungs and O₂ to body cells
- internal respiration, which is the exchange of O₂ and CO₂ between body cells and the blood in systemic capillaries.

10.2.2. Medical Word Elements²⁰⁵

This section introduces combining forms, suffixes, and prefixes related to the respiratory system. Word analyses are also provided.

²⁰³ Medical Terminology Systems - A Body Systems Approach: Respiratory System – Lower Respiratory Tract p. 151

²⁰⁴ intercostal :/ ,ɪntəˈkɒstl/ located between the ribs (= the curved bones that go around the chest)

²⁰⁵ Medical Terminology Systems - A Body Systems Approach: Respiratory System – Medical Word Elements p. 152

Element (Meaning)	Word (Arabic ²⁰⁶)	Pronunciation ²⁰⁷	Analysis
Combining Forms			
Upper Respiratory Tract:			
nas/o (nose) rhin/o	nas/al (أنفِي) rhin/o/plasty (رَأْبُ الأنْفِ)	'neɪzl 'raɪnəʊplæsti	pertaining to the nose -al: pertaining to surgical repair of the nose -plasty: surgical repair Rhinoplasty is performed to correct birth defects or for cosmetic purposes.
sept/o (septum)	sept/o/plasty (رَأْبُ الوْتِيرَة)	septəplæsti	surgical repair of the septum -plasty: surgical repair Septoplasty is commonly performed to correct a deviated septum.
sinus/o (sinus, cavity)	sinus/o/tomy (بَضْعُ الجَيْبِ)	sainəsɒtəmi	incision of any of the sinuses -tomy: incision Sinusotomy is performed to improve ventilation or drainage in unresponsive sinusitis.
adenoid/o (adenoids)	adenoid/ectomy (اسْتِنْصَالُ الغُدَائِيَّاتِ)	,ædɪnɔɪ'dektəmi	excision of adenoids -ectomy: excision, removal
tonsill/o (tonsils)	peri/tonsill/ar (مُحِيطٌ بِاللُّوْرَة)	pəri'tɒnsələ(r)	pertaining to (the area) around the tonsils peri-: around -ar: pertaining to
pharyng/o (pharynx (throat))	pharyng/o/scope (مِنْظَارُ البُلْعُومِ)	fə'riŋgə,skəʊp	instrument for examining the pharynx -scope: instrument for examining
epiglott/o (epiglottis)	epiglott/itis (الْتِهَابُ لِسَانِ المِرْمَارِ)	,epɪ'glɒtəɪtɪs	inflammation of the epiglottis -itis: inflammation Because the epiglottis seals the passageway travelled by air to and from the lungs, inflammation can lead to severe airway obstruction and death. Epiglottitis is treated as a medical emergency.
laryng/o (larynx (voice box))	laryng/o/plegia (شَلْلُ الحَنَجرَة)	,læriŋgə'pli:dʒə	paralysis of the (vocal cords and) larynx -plegia: paralysis

²⁰⁶ <http://www.emro.who.int/Unified-Medical-Dictionary.html>

²⁰⁷ Oxford Advanced Learner's Dictionary, 8th ed. or: <http://dictionary.reference.com/>

trache/o (trachea (windpipe))	trache/o/plasty (رَأْبُ الرُّغَامَى)	,træki'ɒplæsti	surgical repair of the trachea -plasty: surgical repair Tracheoplasty is performed to correct a narrow or stenotic trachea.
Lower Respiratory Tract:			
bronchi/o (bronchus (plural, bronchi))	bronchi/ectasis (تَوَسُّعُ القَصَبَاتِ)	,brɒŋki'ektæsis	dilation of (one or more) bronchi -ectasis: dilation, expansion Bronchiectasis is associated with various lung conditions and is commonly accompanied by chronic infection.
bronch/o	bronch/o/scope (مِنْظَارُ القَصَبَاتِ)	'brɒŋkə'skəʊp	instrument for examining the bronchus or bronchi -scope: instrument for examining A bronchoscope is a flexible tube that is passed through the nose or mouth and enables inspection of the lungs and collection of tissue biopsies and secretions for analysis.
bronchiol/o (bronchiole)	bronchiol/itis (الْتِهَابُ القَصَبِيَّاتِ)	,brɒŋkiəʊ'laitis	inflammation of the bronchioles -itis: inflammation
alveol/o (alveolus; air sac)	alveol/ar (سِنْجِيّ)	æl'vi:ələ(r)	pertaining to the alveoli -ar: pertaining to
pleur/o (pleura)	pleur/o/centesis (بَرْزُ جَنْبِيّ)	,plʊərəʊsen'ti:sɪs	surgical puncture of the pleural cavity; also called thoracocentesis or thoracentesis -centesis: surgical puncture
pneum/o (air; lung)	pneum/ectomy (اسْتِنْقَالُ الرِّئَةِ)	nju:'mektəmi	excision of (all or part of) a lung -ectomy: excision
pneumon/o	pneumon/ia (الْتِهَابُ رِئَوِيّ)	nju:'mæʊniə	condition of inflammation of the lungs -ia: condition The usual causes of pneumonia are infections due to bacteria, viruses, or other pathogenic organisms.

pulmon/o (lung)	pulmon/o/logist (طَبِيبُ الرِّئَةِ)	ˌpʌlməˈnələdʒɪst	specialist in the study (and treatment) of lungs (and respiratory diseases) -logist: specialist in the study of
Other:			
anthrac/o (coal, coal dust)	anthrac/osis (سُحَارٌ فَحْمِيّ)	ˌænthrəˈkəʊsɪs	abnormal condition of coal dust (in the lungs) -osis: abnormal condition; increase (used primarily with blood cells) Anthracosis is a chronic occupational disease found in coal miners and those associated with the coal industry.
atel/o (incomplete; imperfect)	atel/ectasis (انْحِمَاص)	ˌætəˈlektəʊsɪs	incomplete expansion of the lung; also called airless lung or collapsed lung -ectasis: dilation, expansion
coni/o (dust)	pneum/o/coni/osis (سُحَار)	ˌnju:məʊ- ˌkəʊniˈəʊsɪs	condition of dust in the lungs pneum/o: air; lung -osis: abnormal condition; increase (used primarily with blood cells) Pneumoconiosis is usually caused by mineral dusts of occupational or environmental origin. Forms of pneumoconiosis include silicosis, asbestosis, and anthracosis.
cyan/o (blue)	cyan/osis (زُرَاق)	ˌsaɪəˈnəʊsɪs	abnormal condition of blueness -osis: abnormal condition; increase (used primarily with blood cells) Cold temperatures, heart failure, lung diseases, and smothering cause unusual blueness of the skin and mucous membranes due to the build-up of carbon dioxide in the blood.

lob/o (lobe)	lob/ectomy (اسْتِئْصَالُ الْفَصِّ)	ləʊ'bektəmi	excision of a lobe -ectomy: excision Lobectomies are performed when a malignancy is confined to a single lobe of any lobed organ, such as the lungs, liver, brain, and thyroid gland.
ox/i (oxygen)	ox/i/meter (مِقْيَاسُ التَّأَكْسُجِ)	ɒk'sɪmɪtər	instrument used for measuring oxygen -meter: instrument for measuring An oximeter is usually attached to the tip of a finger but may also be placed on a toe or ear lobe. It provides a measurement of the oxygen saturation level of the blood.
ox/o	hyp/ox/emia (نَقْصُ تَأَكْسُجِ الدَّمِ)	ˌhaɪpɒk'sɪmiə	deficiency of oxygen in blood hyp-: under, below, deficient -emia: blood condition
pector/o (chest)	pector/algia (أَلَمٌ صَدْرِيّ)	'pektərældʒiə	pain in the chest; also called thoracalgia, thoracodynia, and pectorodynia -algia: pain
steth/o	steth/o/scope (سَمَاعَةٌ)	'steθəskəʊp	instrument used for examining the chest -scope: instrument for examining A stethoscope enables evaluation of sounds in the chest as well as the abdomen.
thorac/o	thorac/o/pathy (اِعْتِلَالٌ صَدْرِيّ)	'θɔ:rəkəʊ,pəθi	disease of the chest -pathy: disease
spir/o (breathe)	spir/o/meter (مِقْيَاسُ التَّنَفُّسِ)	spra'rɒmɪtə	instrument for measuring breathing -meter: instrument for measuring A spirometer measures how much air the lungs can hold (vital capacity) as well as how much and how quickly air can be exhaled.

Suffixes			
-phonia (voice)	dys/phonia (حَلَلُ التَّصْوِيْت)	dɪs'fəʊniə	bad (impaired) voice quality dys-: bad; painful; difficult Dysphonia includes hoarseness ²⁰⁸ , voice fatigue, or decreased projection ²⁰⁹ .
-pnea (breathing)	a/pnoea (apnea) (انْقِطَاعُ النَّفْس)	æp'ni:ə	not breathing a-: without, not Apnoea is a temporary loss of breathing and includes sleep apnoea, cardiac apnoea, and apnoea of the newborn.
-thorax (chest)	py/o/thorax (تَفْيِخُ الصَّدْر)	,paɪəʊ'tθɔ:ræks	pus in the chest (cavity); also called empyema ²¹⁰ py/o: pus Pyothorax is usually caused by a penetrating chest wound or spreading of infection from another part of the body.
Prefixes			
dys- (bad; painful; difficult)	dys/pnea (زُلَّة)	dɪsp'niə	difficult breathing -pnea: breathing Dyspnea includes any discomfort or significant breathlessness.
tachy- (rapid)	tachy/pnea (تَسْرُغُ النَّفْس)	,tækɪp'niə	rapid breathing -pnea: breathing

²⁰⁸ Hoarse: /hɔ:s/ (hoarseness /hɔ:snəs/) (of a person or voice) sounding rough and unpleasant, especially because of a sore throat

²⁰⁹ Projection: /prə'dʒekʃn/ the act of making your voice, a sound, etc. audible (= able to be heard) at a distance

²¹⁰ Empyema: /,empai'i:mə/ (pl. -emas; -emata /-'i:mətə/) a collection of pus in a body cavity, esp in the chest