

RESPIRATORY

EXAMINATION

2010

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RESPIRATORY EXAMINATION

- ❖ **Common cases in exam:** - **1** - Obstructive air way disease.
- 2** - pneumonia.
- 3** - Plural effusion.
- 4** - Interstitial lung disease.

Preparation of examination:-

- Stand on the Right side of bed.
- Introduce yourself.
- Permission taken.
- Good position for PT:- **1** - ANT⇒45 or flat.
- 2** - Post ⇒set patient on his bed.
- Good exposure: - all chest is exposed.

1))- Inspection:-

- **5s [Symmetry, Swelling, Scar, Superficial dilated veins, Skin discoloration].**
- Deformities.
- Chest expansion.
- R.R
- **Asymmetry:-**bulge or retraction.

To know it's bulge or retraction ask patient to breath from his mouth

The part that moves with respiration it's normal & other site is the abnormal.

bulge	retraction
1)-pneumothorax	1)-collapse
2)-p.effusion	2)-fibrosis
3)-Lung mass (tumor)	

- **Scar:-**plural tap (thoracocentesis)⇒**seen in axilla** .

Surgical scar may:- **1** - localized Emphysema.

2 - localized Bronchiectasis.

3 - hydrated cyst.

4 - Tumor rare.

- **Superficial veins:-** occur in [svc]⇒ obstruction in lung⇒ as in (pancast tumor)

- **Deformity:** - **1** - pigeon chest [pectus carinatum].
2 - funnel chest [pectus excavatum].
3 - barrel chest $\Rightarrow$ $\uparrow$ **A/P** diameter.
4 - kyphosis, scoliosis, kyphoscoliosis.

N.B.:- any chest deformity can lead to respiratory failure type 2 .

- Ask pt. to breathing normally $\Rightarrow$
 - a)** - look for accessory muscles use $\Rightarrow$ Tracheal tug $\Rightarrow$ Descend of trachea with inspiration $\Rightarrow$ COPD.
 - b)** - look to nose for acting ala-nasi (flaring).
 - c)** - Hear for wheeze.

Comment:- bilateral equal symmetrical chest expansion all over zones no scar no dilated veins no deformities.

2= Palpation:-

- Chest expansion $\Rightarrow$ **[anterior, posterior]**.
- Tactile vocal fremitus.
- Trachea.
- Apex beat.
- Chest expansion: - at 3 level from front & back.

A)-From front: - 1) - supra mammary.

2) - Mammary line.

3) - Costal cartilage.

B)-From back: - 1) - shoulders.

2) - Scapula.

3) - Below scapula angle.

N.B:- Confirm by tape measure $\Rightarrow$ normal chest expansion (3-5cm) if <2 cm means restricted .

- **Tactile vocal fremitus:-** palpate transmitted sounds through chest wall by ask pt. to say 44.
- **Trachea:-** set pt. first $\Rightarrow$ measure distance between trachea & both sternocleidomastoid Ms. $\Rightarrow$ normally shift slight to right side.
- **Apex beat:-** deviated or not & palpated or not .

Note:- Trachea & apex beat $\Rightarrow$ useful in case of shift mediastinum.

- Trachea $\Rightarrow$ for upper mediastinum.
- Apex beat $\Rightarrow$ for lower mediastinum.

3 = Percussion:-

Sites & types:-

Anteriorly:-

- 1 - Direct on the clavicle ⇒ for apical segment lesion.
- 2 - On the 2nd to 4th intercostal space mid-clavicular line.
- 3 - On the 6th intercostal space anterior axillary line.
- 4 - Lateral
 - a) - Rt axilla ⇒ for middle lobe of Rt lung.
 - b) - Lt Axilla ⇒ for lingual in Lt Lung.

Posteriorly:-

- 1 - Apex ⇒ on supra clavicular fossa.
- 2 - On the 3th to 9th ⇒ between & infra-scapular.

Types of sound:-

- 1 - Resonant ⇒ normal.
- 2 - Hyper-resonance ⇒ emphysema, pneumothorax.
- 3 - Dullness ⇒ collapse, consolidation.
- 4 - Stony dullness same above tibia ⇒ massive effusion.

Note:-

- Only direct percussion from anterior above clavicle.
- Only 2 sites percuss by 3 fingers in same time [apex ⇒ from back] [axilla ⇒ lateral].
- When you examine anteriorly or posteriorly ⇒ in both you have to examine laterally.
- Upper lobe mainly examine from front.
- Middle lobe mainly examine from laterally.
- Lower lobe mainly examine from back.

4 = Auscultation:-

1 - **Air entry:** - Good or audible, reduced, absent, no ↑.

2 - Type of breathing :-

- Vesicular breathing ⇒ inspiration > expiration ⇒ normally
- Broncho-vesicular breathing ⇒ as vesicular but ↑ expiration ⇒ as in obstructive air way diseases.
- Bronchial breathing ⇒ inspiration = expiration with gap ⇒ as in consolidation (pneumonia)

Note: - Bronchial breathing occurs only with consolidation (pneumonia).

3 - Added sound:-

a. Crepitation = crackles = rales

Fine (end of inspiration) Not disappear by cough.	Coarse (during inspiration & expiration) Disappear by cough.
1-ILD (fibrosing alveolitis)	1 -bronchiectasis.
2 -pulmonary edema	2 -chronic bronchitis.
3 -early stage of pneumonia.	3 -late pneumonia.
N.B occurs due to re-opening in distal of occluded alveoli or section in distal airway.	N.B due to air bubbling through secretion in large air way.

b. Rhonchi or wheeze → mainly in expiration.

Rhonchi definition: it's a musical sound due to airway obstruction and heard mainly during expiration and its **2** types:

Monophonic: its low pitched indicates local obstruction to major airway and so unilateral.

Polyphonic: variable high pitched heard bilaterally indicated either asthma or COPD.

❖ **D/D rhonchi(wheeze):-**

- 1-** Asthma.
- 2-** Ch. Bronchitis.
- 3-** ± emphysema.
- 4-** Bronchiectasis.
- 5-** ± Pneumonia.
- 6-** **H.F** with pulmonary edema

c. Vocal resonance: - As tactile vocal fremitus but hear audible vibration by ask pt. to say 44.

Test only for consolidation: - (confirmatory)

Whispered pectoriloquy → whispered 44 → heard loud in area with consolidation.

Ego-phony: - **E** heard **A** in area of consolidation.

❖ **How to diagnosis According to finding:-**

Decrease in chest expansion	
Unilateral	Bilateral
1)-pneumothorax → Upper lobe	1 -asthma.
2)-plural effusion → Lower lobe	2 -COPD.
3)-collapse → any lobe	3 -brondhiectasis.
4)-lobar pneumonia → any lobe	4 -broncho-pneumonia.
	5 -ILD.

If unilateral do tactile vocal fremitus

Increase	Decrease
Pneumonia ⇒ dull	Collapse ⇒ dull
	Pneumothorax ⇒ hyper Resonant
	Plural effusion ⇒ stony dull

If trachea shift

Away	To same side
Plural effusion	collapse
pneumothorax	

N.B:- usually unilateral lesion can be differentiated without auscultation but bilateral lesion should be auscultating to differentiate.

❖ Lesions bilateral:-

❖ In case of obstructive airway disease (**Asthma, COPD and Bronchiectasis**) Share same finding:-

- 1) - ↓ air entry.
- 2) - vesicular breathing with prolonged expiration.
- 3) - Rhonchi (± Crepitation)⇒in chronic bronchitis, bronchiectasis)

If you find:-

Rhonchi only	Rhonchi +crepitation	Crepitation only
asthma	Chronic bronchitis	ILD
COPD	bronchiectasis	pneumonia
bronchiectasis	pneumonia	

Note:-

- 1- The only finding in **ILD** is crepitation.
- 2- All plural disease ↓↓ of all chest examination.
- 3- Increase of **TVF & VR** only in pneumonia, Collapse (in present of open air way).
- 4- Stony dullness occurs only in massive plural effusion.

General examination related to respiratory:-

General look: - [ill, underweight, distress, confusion].

1 - Face: - **1** - jaundice $\Rightarrow$ lung CA metastasis, RVF (cardiac cirrhosis)

2 - Anemia $\Rightarrow$ chronic illness.

3 - Plethoric face $\Rightarrow$ polycythemia (non-metastatic sign of lung CA).

4 - Act ala-nasi $\Rightarrow$ COPD & distress.

5 - Central cyanosis $\Rightarrow$ pulmonary edema.

6 - Ptosis $\Rightarrow$ Horner syndrome $\Rightarrow$ apical lung tumor.

7 - Halitosis $\Rightarrow$ bronchiectasis.

2 - Neck: - **1** - L.N $\Rightarrow$ metastasis, cervical, scalene.

2 - JVP $\Rightarrow$ RVF $\Rightarrow$ due to core pulmonale

3 - accessory Ms. Use $\Rightarrow$ obstructive airway.

3 - Hand: - **1** - Clubbing : - most Common bronchiectasis.

2 - Cyanosis.

3 - Flapping tremor $\Rightarrow$ CO₂ retention due to **COPD**.

4 - Nicotine stain .

5 - Lower limb: - **1** - bilateral leg edema $\Rightarrow$ due to **RVF**.

2 - unilat $\Rightarrow$ **DVT** $\Rightarrow$ sever dyspnea.

Revision questions:-

What are the causes of dullness at a lung base?

1 - Pleural effusion.

2 - Pleural thickening $\Rightarrow$ mesothelioma

3 - Consolidation and collapse of the lung.

4 - Raised hemi-diaphragm $\Rightarrow$ phrenic nerve palsy.

How would you differentiate between the above?

1 - Pleural effusion: stony dull note; trachea may be deviated to the opposite side in large effusions.

2 - Pleural thickening: trachea not deviated; breath sounds will be heard.

3 - Consolidation: vocal resonance increased; bronchial breath sounds and associated crackles.

4 - Collapse: trachea deviated to the affected side; absent breath sounds.

Mention a few causes for an exudate and a transudate.

Causes for an exudate:	Causes of a transudate:
1- Bronchogenic carcinoma (presence of effusion is an ominous sign). 2- Secondaries in the pleura (lung, breast, ovary and pancreas). 3- Pneumonia • para-pneumotic effusion 4- Pulmonary infarction. 5- Tuberculosis. 6- Rheumatoid arthritis. 7- SLE. 8- Lymphoma (in young individuals). 9- Mesothelioma.	1- Nephrotic syndrome. 2- Cardiac failure. 3- • Liver cell failure.

Mention a few conditions in which the pleural fluid pH and glucose levels are low with a raised LDH concentration.

Empyema, malignancy, tuberculosis, rheumatoid arthritis, systemic lupus erythematosus and oesophageal rupture • Hypothyroidism.

In which conditions is the pleural fluid bloody?

Haemorrhagic fluid is seen in malignancy, pulmonary embolus, tuberculosis and trauma to the chest.

What are the earliest radiological signs of pleural fluid?

The earliest radiological signs are blunting of the costophrenic angle on the anterior-posterior view or loss of clear definition of the diaphragm posteriorly on the lateral view.

How would you confirm your suspicions when in doubt of a small effusion ?

Either by a lateral decubitus view (which shows a layering of the fluid along the dependent chest wall unless the fluid is loculated) or by ultrasonography.

What are the other uses of ultrasonography in the diagnosis of pleural effusion ?

Ultrasonography is also useful for loculated effusions, for guided thoracocentesis, closed pleural biopsy or insertion of a chest drain, and to differentiate pleural fluid from pleural thickening.

What are the complications of thoracocentesis?

Pneumothorax, haemothorax, intravascular collapse and unilateral pulmonary oedema (the latter after withdrawal of large quantities of fluid).

What do you know about Meigs' syndrome?

Meigs' syndrome:- comprises pleural effusion (usually right-sided and a transudate) associated with ovarian tumours (usually benign ovarian fibroma)

Mention a few trigger factors known to aggravate asthma.

- 1** - Infection.
- 2** - Emotion.
- 3** - Exercise.
- 4** - Drugs, e.g. beta-blockers.
- 5** - External allergens.
- 6** - cold weather .

What do you understand by the term 'asthma'?

Asthma is an inflammatory disorder characterized by hyper-responsiveness of the airway to various stimuli, resulting in widespread narrowing of the airway, The changes are reversible.

What are the features of acute severe asthma?

- 1** - Inability to complete a sentence in one breath.
- 2** - Respiration rate greater than 25 per minute.
- 3** - Pulse rate greater than 110 beats per minute.
- 4** - Peak expiratory flow rate less than 50% of predicted .

What are the life-threatening indicators in acute asthma?

- 1** - Peak expiratory flow rate less than 33% of predicted or best.
- 2** - Exhaustion, confusion, coma.
- 3** - Silent chest, cyanosis or feeble respiratory effort.
- 4** - Bradycardia or hypotension.

Note. Arterial blood gases should be measured if any of these features are present or if oxygen saturation is less than 92%.

What are the indicators of a very severe, life-threatening attack?

- 1** - increased carbon dioxide tension $>45\text{mmHg}$
- 2** - Severe hypoxia of less than 8 kPa (60 mmHg).
- 3** - Low pH.

What are the indications for mechanical ventilation with intermittent positive pressure ventilation ?

- 1- Worsening hypoxia ($P_{aO_2} < 8$ kPa) despite 60% inspired oxygen.
- 2- Hypercapnia ($P_{aCO_2} > 6$ kPa).
- 3- Drowsiness.
- 4- Unconsciousness.

What do you understand by the term 'chronic bronchitis'?

Chronic bronchitis is cough with mucoid expectoration for at least 3 months in a year for 2 successive years.

What is the definition of emphysema?

Emphysema is the abnormal permanent enlargement of the airway distal to the terminal respiratory bronchioles with destruction of their walls.

How would you differentiate emphysema from chronic bronchitis?

	Emphysema	Chronic bronchitis
	Pink puffer	Blue bloater
Cyanosis	Absent	Prominent
Dyspnoea	++	+
Hyperinflation	++	+
Cor pulmonale	-	Common
Respiratory drive	High	Low

What do you understand by the term 'bronchiectasis'?

It is a chronic necrotizing infection of the bronchi and bronchioles leading to abnormal, permanent dilatation of the airways.

What are the complications of bronchiectasis?

- 1- Pneumonia, pleurisy, pleural effusion, pneumothorax.
- 2- Sinusitis.
- 3- Haemoptysis.
- 4- Brain abscess.
- 5- Amyloidosis.

What are the major respiratory pathogens in bronchiectasis?

Staphylococcus aureus, Haemophilus influenzae, Pseudomonas aeruginosa.

What are the common sites for localized disease?

Left lower lobe and lingula.

What are the causes of a poorly resolving or recurrent pneumonia ?

- 1-** Carcinoma of the lung.
- 2-** Aspiration of a foreign body.
- 3-** Inappropriate antibiotic.
- 4-** Sequestration (rare; suspect if left lower lobe is involved).

What are the complications of pneumonia?

- 1-** Septicaemia.
- 2-** Lung abscess.
- 3-** Empyema.
- 4-** Adult respiratory distress syndrome.
- 5-** Multiorgan failure, renal failure.
- 6-** Haemolytic syndrome.
- 7-** Death.

What are the causes of lung collapse?

- 1-** Bronchogenic carcinoma.
- 2-** Mucus plugs (asthma, allergic bronchopulmonary aspergillosis; BMJ1982; 285: 552).
- 3-** Extrinsic compression from hilar adenopathy (e.g. primary TB).
- 4-** Tuberculosis (Brock's syndrome).
- 5-** Other intrabronchial tumours including bronchial adenoma.

What is Brock's syndrome?

It is collapse due to compression of the right middle lobe bronchus by an enlarged lymph node.

When finishing the chest examination of bronchiectasis cases the examiner will ask you "Do you like to examine any other thing in this patient?"

answer ⇒ yes I like to examine the hands for clubbing.

In case of Bronchiectasis the examiner will tell you that after 20 years of this patient's disease the patient is started to develop renal failure and the examiner will ask what do think the cause

answer will be its renal failure due to Secondary Amyloidosis .