

# Medicine –Respiratory System

## Physical Examination

### Start the examination with: WIP<sup>3</sup>E

- **Wash hands:** Wash your hands in front of the examiner or bring a sanitizer with you.
- **Introduce yourself and explain the examination:** My name is ( your name), I'm a third year medical student. I'm going to do a physical examination for your respiratory system, which involve looking, feeling and listening to your chest by stethoscope.
- **Permission:** Explain what are you going to do and take his permission.
- **Position:** **Sitting at 90°**
- **Privacy:** I Should maintain the patient's privacy.
- **Exposure:** **Full exposure of the trunk** (if you couldn't, tell the examiner from the beginning). Ask 'can you take off your shirt please?'

### General Appearance: (ABC<sup>2</sup>DE)

1. **A**ppearance: The patient is (young, middle aged or old) and looks well (state of health)
2. **B**ody built: He looks (normal, thin or obese)
3. **C**onnections: Around the bed I can't see any medications, O2 mask, or chest tube(look at the lateral sides of chest wall), metered dose inhalers, and the presence of a sputum mug.
4. **C**olor: Check if he looks pale or jaundiced
5. **D**istress: The patient looks comfortable and he doesn't appear short of breath and he doesn't obviously use accessory muscles or any heard wheezes. **To determine this, check for:**
  - **Dyspnea:** Assess the rate, depth, and regularity of the patient's breathing by counting the respiratory rate, range (16–25 breaths per minute).
  - **Signs of COPD:** By looking to see whether the accessory muscles of respiration are being used, or if there's pursed-lips breathing. Patients with severe COPD may feel more comfortable leaning forwards with their arms on their knees.
  - **Character of the cough** (Ask the patient to cough several times.).
  - **Sputum:** Comment on colour, volume and type (purulent, mucoid or mucopurulent), and the presence or absence of blood.
  - **Stridor:** A rasping or croaking noise loudest on inspiration, due to a foreign body, a tumor, infection, or inflammation.
  - **Hoarseness - Audible breathin**
6. **ELSE:** Check if he is conscious.

**Example:** The patient looks well, lying comfortably on the bed, not distressed. The patient has a good body shape, not obviously using his accessory muscles, there is no heard wheezes and he is not connected to I.V lines, oxygen mask or chest tubes

## Hands:

**Hands:** Check for Symmetrical warm, nicotine staining, muscle wasting and weakness, erythema marginatum, capillary refill, edema.

Hypertrophic pulmonary osteoarthropathy: swelling and tenderness over the Wrist.  
Palmar erythema, prominent veins.

**Nails:** Cyanosis, Clubbing, Capillary refill, splinter hemorrhages, nail signs of iron def

**Pulse:** Take the patient's radial pulse and determine the Rate, Rhythm, Volume and the Character of the pulse.

**Flapping tremor** - (Asterixis),

**Fine tremors.**

## Face:

### Eyes:

- 1- Check for pallor in conjunctiva
- 2- Check for ptosis, miosis, anhidrosis or enophthalmos

### Nose:

- 1- Nasal septum deviation
- 2- Nasal polyps or discharge

### Mouth:

- 1- Peripheral cyanosis
- 2- Central cyanosis: Can you stick out your tongue?
- 3- Oral dental hygiene
- 4- Congested tonsils or pharynx

## Neck:

- 1- Check the Carotids for a bruit (by bell side and do it bilaterally),
- 2- Assess the jugular venous pressure and the jugular venous pulse form using a torch (bilaterally).

## Sacral edema

## Lower limb:

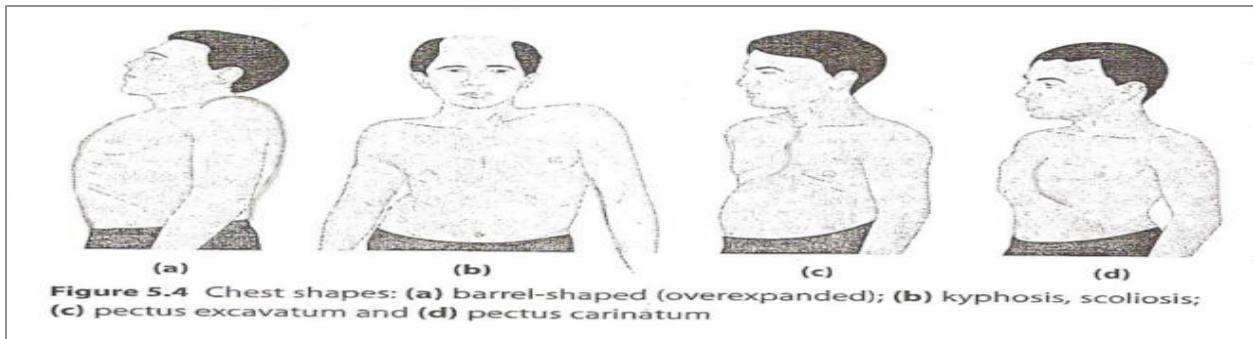
1. Check for edema,
2. Check peripheral pulses (dorsalis pedis and posterior tibial).

## Local Examination; FRONT

### A. Inspection:

1. Check if there's any deformity: e.g. pectus excavatum or pectus carinatum, Barrel shaped, Harrison's sulcus
2. Scars: e.g. Midline sternotomy *or* Lateral thoracotomy, Tracheostomy
3. devices connected to the patient: Chest tube "at the lateral sides"
4. Type of breathing: Abdominothoracic (males) or thoracoabdominal (females).
5. Movement of the chest wall: look for asymmetry of chest wall movement.
7. Apex beat: Visible or not (with the aid of torch).
8. Skin Lesions: Erythema and thickening from chemotherapy
9. Subcutaneous emphysema: Diffuse swelling of the chest wall and the neck → pneumothorax.

Don't forget to compare one side to the other



### B. Palpitation: Ask the patient if he has any pain before starting.

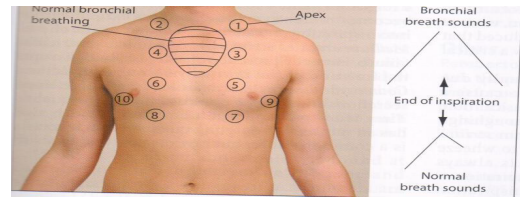
1. Check if the trachea is centrally located. Trachea will be pulled to the site of lesion in lung collapse, interstitial pulmonary fibrosis (IPF). It will be pushed away from the site of the lesion in the presence of a tumor, pleural effusion, or tension Pneumothorax. Comment (if there is no deviation); trachea is centrally located. **"If deviated to the left it's either right lung pneumothorax or left lung collapse"**
2. **Tracheal tug:** ask the patient to take deep breath? your finger will be pulled down in severe airway obstruction.
3. **Symmetrical chest expansion:** I will put my hand around your chest and I want to take deep breath looking for any asymmetry of the chest
4. Check if the apex beat is palpable: located in the 5th intercostal space in mid-clavicular line which is normal
5. **Tactile vocal Fremitus: Do NOT miss the laterals**
6. **Palpate the ribs** Localized pain suggests a rib fracture, which may be secondary to trauma or sometimes the result of severe and prolonged coughing.



Palpation for lower lobe

### C. Percussion: Comment on the sound produced

- **Percuss the chest:** Normally it is resonant and symmetrical in both sides.
- **Liver dullness** resonant below level of the liver, it is a sign of hyperinflation, usually due
- **Cardiac dullness** may be decreased in emphysema or asthma.



### D. Auscultation: Do NOT miss the laterals

1. Ask the patient to take deep breaths through the mouth.
2. Follow the same areas of percussion:
  - Normally it is vesicular breathing, which is symmetrical in both sides, with no added sounds, crackles or wheezing.
3. Give a comment about breath sound or any abnormal sounds.
4. Intensity of the breath sounds: Added sounds
5. Vocal resonance.
6. Whispering Pectoriloquy test: The most sensitive test for consolidation. Normally his/her voice will not be clear.

In case of consolidation, the voice becomes very clear

## Local Examination; BACK

### A. Inspection

- Shape, symmetry, scars, erythema and chest tube.
- Deformities:
  - Scoliosis; curved chest, or S-shaped.
  - Kyphosis; K-shaped, seen from the side.
  - Kyphoscoliosis both deformities together, seen in patients with poliomyelitis.
- Movement of the chest wall



Inspecting upper lobe expansion: (a)

### B. Palpation

- Chest expansion.
- Tactile vocal fremitus.
- Palpate the regional lymph nodes.

The golden rule: remove the Scapula

### C. Percussion

- Percuss the same areas as the front.

Don't forget to compare one side to the other

## D. Auscultation

- Auscultation.
- Vocal resonanance.
- Whispering Pectpriloquy test.



## End the examination with:

- Ask if the patient has any questions
- Thank the patient and cover him

## To complete the Examination

1. Examining the sputum, temperature and oxygen saturation.
2. Request a Chest X-ray.
3. Perform peak flow assessment.
4. Cardiac and abdominal examination
5. **PEMBERTON'S SIGN:** Ask the patient to lift the arms over the head and wait for one minute. Note the development of facial plethora, cyanosis, inspiratory stridor and no pulsatile elevation of the JVP. This occurs in superior vena cavil obstruction.

## Remember

- If your examiner asks you to examine the chest not “Respiratory Examination” then start locally from the chest, and then move peripherally if you have time.
- Cardiac examination is an essential part of the respiratory assessment and vice versa.
- Usually in the exam ask you to do only local examination not all the respiratory examination.
- Usually in the exam there won't be a real human, so in some procedures which need communication with a patient just mention them.
- You should to know each procedure is done for what.
- Don't forget to examine the patient from the right side.
- Don't forget, before palpate ask if there is any pain.
- Don't forget to say to the examiner: I will start locally from the chest, If I have time I will move to peripheral.

## Interpretation of Abnormal findings

Abnormality	Indicates
Lack of the usual explosive beginning	Vocal cord paralysis (the 'bovine' cough).
A muffled, wheezy, ineffective cough	Obstructive pulmonary disease.
A very loose productive cough	Excessive bronchial secretions due to chronic bronchitis, pneumonia or bronchiectasis.
A dry, irritating cough	Chest infection, asthma or carcinoma of the bronchus and sometimes with left ventricular failure or interstitial lung disease (ILD). It is also typical of the cough produced by ACE inhibitor drugs.
A barking or croupy cough	Problem with the upper airway—the pharynx and larynx, or pertussis infection.

Abnormality	Indicates
<b>Reduced chest wall movement on one side</b>	Localized lung fibrosis, consolidation, collapse, pleural effusion or pneumothorax.
<b>Bilateral reduction of chest wall movement</b>	Indicates a diffuse abnormality such as COPD or diffuse interstitial lung disease.
<b>Unilateral reduced chest excursion or splinting</b>	Present when patients have Pleuritic chest pain or injuries such as rib fractures.
<b>flapping tremor, Palmar erythema, prominent veins</b>	CO <sub>2</sub> retention (usually due to severe COPD)

Sound	Indicates
Resonant	Normal.
Dull	Indicates consolidations over the liver area, tumor, fibrosis, and infection.
Stony dull	Pleural effusion.
Hyper-resonant	Pneumothorax, emphysema.

Types of NORMAL lung sounds			
Known as:	Bronchial	Bronchovesicular	Vesicular
Site where it's Heard at	Manubrium (Over the Trachea)	1st and 2nd intercostals anteriorly, and in between the scapulas posteriorly	All over the lung regions
Sound volume during Respiratory phases	Expiration is louder	Both are equal	Inspiration is louder
Inspiratory and expiratory gap	There is often a gap	-	There is no gap
Duration of Respiratory phases	Inspiratory and expiratory phases are equal	-	Inspiratory phase is longer than the expiratory one
Notes	Can be heard over areas of consolidation	-	-

Interrupted (crackles)			
Non-musical sounds, some authors describe low-pitched crackles as rales and high-pitched ones as crepitations. Crackles are sometimes present in normal people but these crackles will always clear with coughing.			
Early inspiratory crackles (which cease before the middle of inspiration)	Late or pan-inspiratory crackles		
Suggest disease of the small airways and are characteristic of COPD	Suggest disease confined to the alveoli. They may be fine, medium or coarse in quality.		
	Fine crackles	Medium crackles	Coarse Crepitations
	Interstitial lung disease (pulmonary fibrosis)	Left ventricular failure	Bronchiectasis, consolidation.

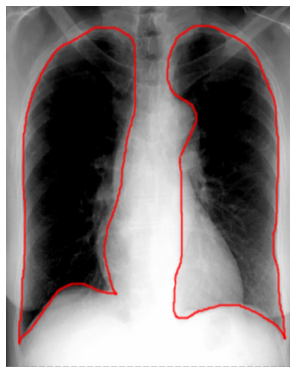
Continuous (wheezes)	
Have a musical quality, may be heard in expiration or inspiration, or both, louder on expiration, indicates significant airway narrowing.	
Wheezes	Rhonchi
High pitched	Low-pitched
Produced in the smaller bronchi and have a whistling quality	Arise from the larger bronchi.
Heard in Asthma	Heard in COPD
Wheezes are usually the result of acute or chronic airflow obstruction.	

## Summary

	Trachea	Chest Expansion	Percussion	Breath sound	Added sound
<b>Consolidation</b>	Central	↓	Dull	Bronchial	Course crepitations
<b>Asthma</b>	Central	↓	Resonant	Vesicular	Wheezing
<b>Fibrosis</b>	Same side	↓	Resonant	Vesicular	Fine crackles
<b>Effusion</b>	Opposite side	↓	Stony dull	No	No
<b>Collapse</b>	Same side	↓	Dull	No	No
<b>Pneumothorax</b>	Opposite side	↓	Hyper-resonant	No	No



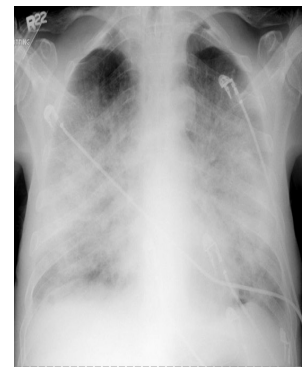
Pneumonia



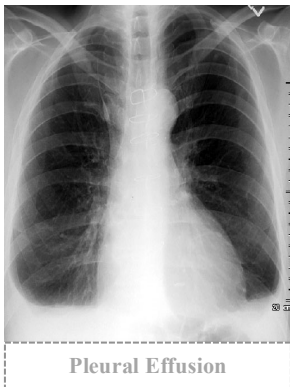
Normal Lung



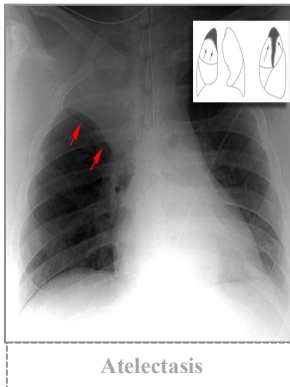
Emphysema



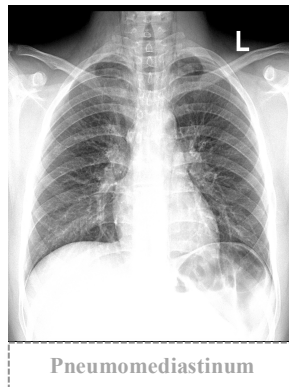
Acute Pulmonary Edema



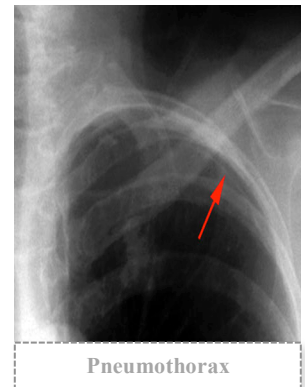
Pleural Effusion



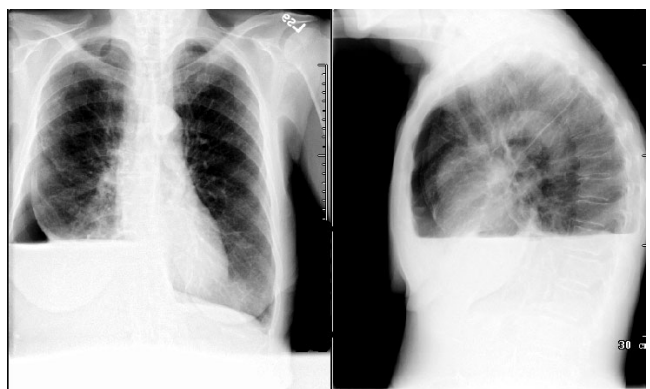
Atelectasis



Pneumomediastinum



Pneumothorax



Hydro-pneumo-thorax

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