

EXAMINATION OF RESPIRATORY SYSTEM

Before you start examination

Do not forget !!!!!

- Appropriate PPE
- Introduce yourself
- Take permission with brief explanation to examination needed.
- Provide privacy
- Hands hygiene
- Exposure to chest (umbilicus and above)
- Position (lying on bed at 45 degrees)

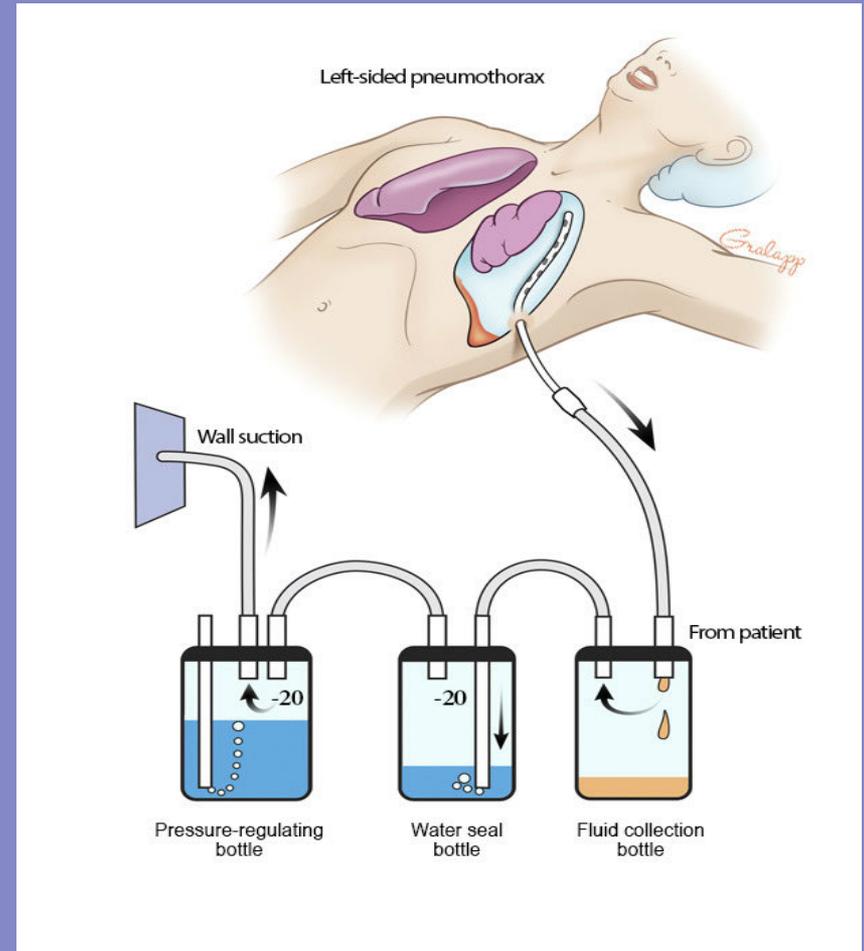
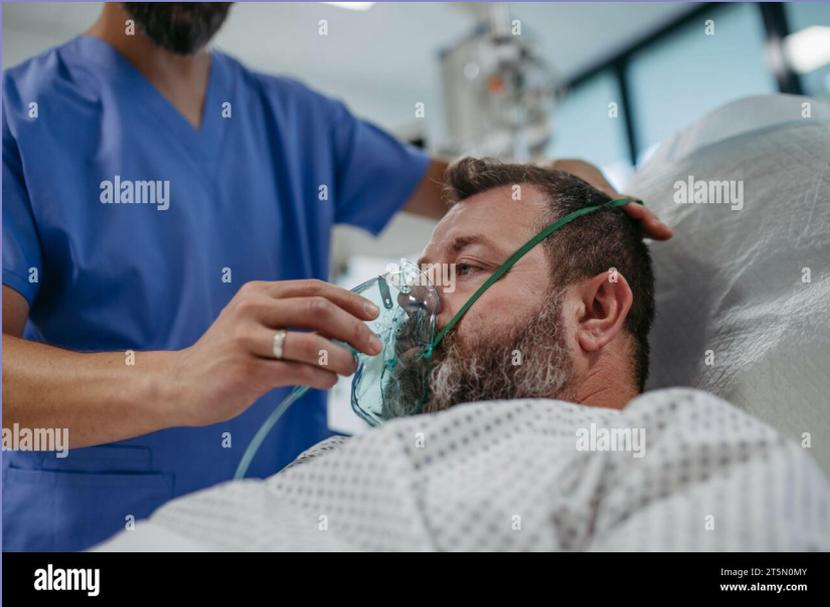
Chest Examination:

- Inspection
- Palpation
- Percussion
- Auscultation

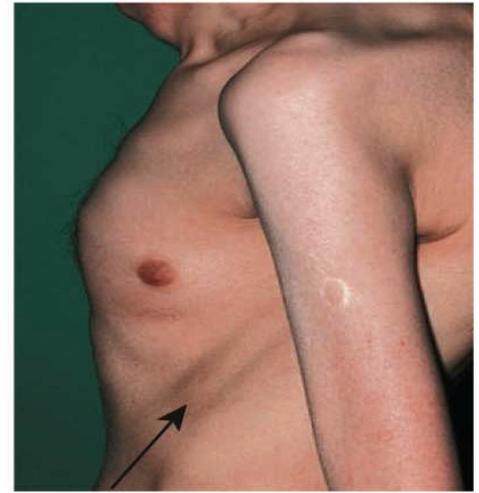
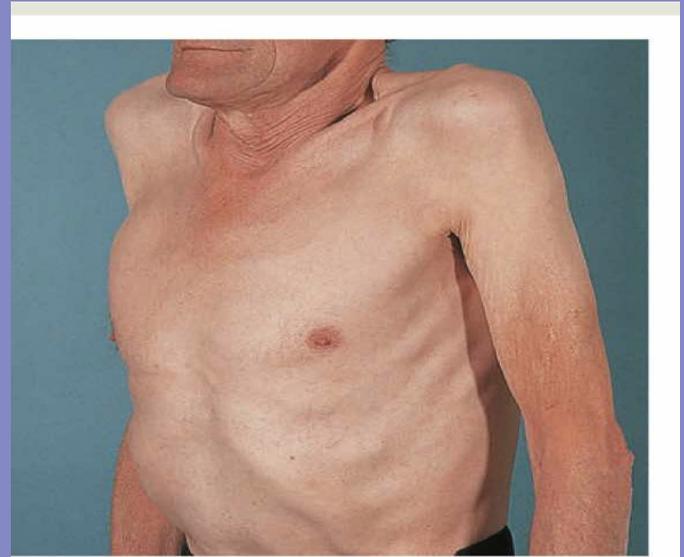
GENERAL EXAMINATION

From end of the bed look for :

- 1- Looking of the patient (consciousness comfortable/ dyspnic/ in distress)
- 2- Surrounding equipments (oxygen , fluids ,cig,inhalers etc)
- 3- Visible scars and thoracotomy drains
- 4- Chest deformities or assymetry (pectus excavatum (funnel) , carinatum(pigeon chest) , hyperinflated chest) .
- 5- observe RR (respiratory rate) , how many breaths in 15 second *4 (Normally 12-15 breath/ minute)







C

Pursed Lip Breathing



Breathe in



Breathe out

General examination from Right side of the bed :

- 1-Cyanosis: central or peripheral
- 2-Pallor (Conjunctiva , hands creases)> sign of anemia / plethoric face in polycythemia
- 3- Tobacco stains, clubbing, yellow nails on fingers
- 4- Wasting of hands muscles – pancoast tumor
- 5-Signs of fluid overload (LLE, Raised JVP which indicate cor-pulmonale
- 6-Rashes (Erythema nodosum in sarcoidosis , eczema)
- 7- Horner's syndrome(ptosis, miosis---ca. bronchus
- 8-Chemosis with dusky swelling of face and neck ---SVC obstruction
- 9- Check vital signs including o2 sat , pulse , BP .
 - Tachycardia --> 120/min—infections , P.E , asthma
 - Pulsus paradoxus : Status asthmaticus, Massive pulmonary embolism, Tension pneumothorax
- 10- Hands temprature (cool in low perfusion , sweaty in co2 retention)
- 11- Start inspection to chest closely if deformities , rashes or scars not seen from the end of the bed

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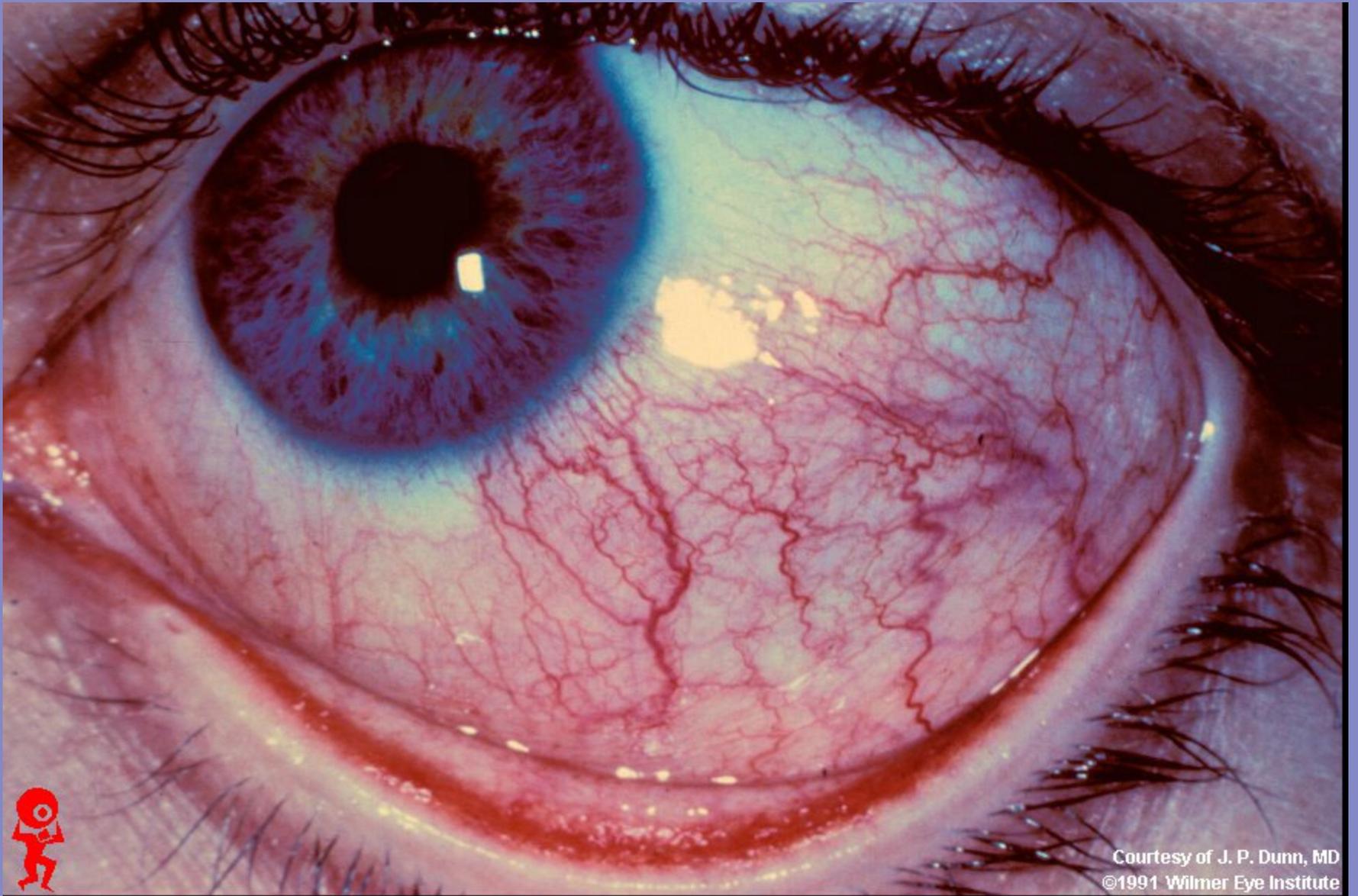
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Courtesy of J. P. Dunn, MD
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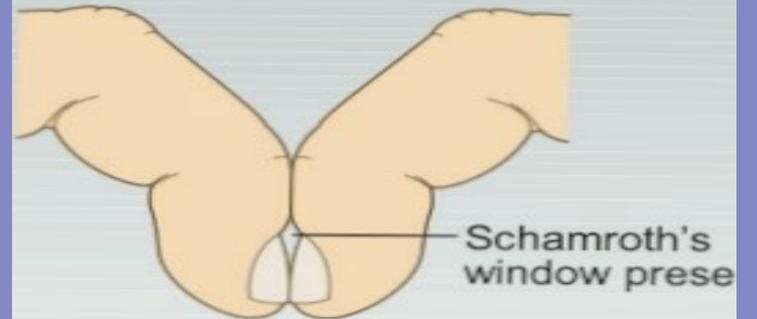


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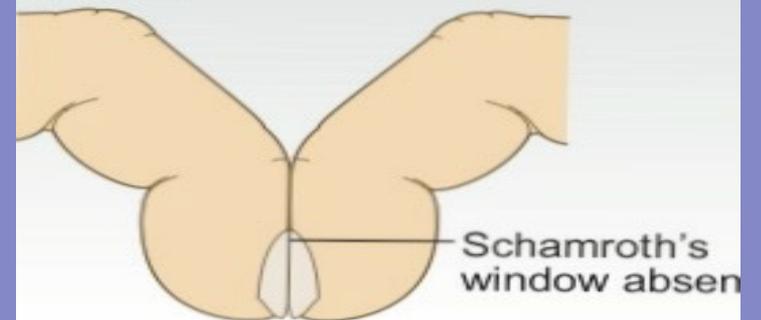


view.

Normal



Clubbed



Palpation

1- Check tracheal position for deviation :

- Have the patient in a seated or standing position for ease of access to the neck.
- Inspect the neck visually, looking for any obvious deviation of the trachea from the midline. Palpate the trachea gently with your index finger .
- Shifted trachea is pathological (toward the abnormality in collapse , fibrosis or pneumonectomy / away in massive effusion , tension pneumothorax and masses)

2- Measure cricosternal distance : is the distance between the **inferior border of the cricoid cartilage** and the **suprasternal notch**: A distance of fewer than 3 fingers suggests underlying **lung hyperinflation** (e.g. asthma, COPD).

3- Palpate apex beat : a displaced apex beat can be caused by right ventricular hypertrophy (e.g. pulmonary hypertension, COPD, interstitial lung disease) , Large pleural effusion or Tension pneumothorax

Palpation

4- chest expansion:

- Place your hands on the patient's chest, inferior to the nipples.
- Wrap your fingers around either side of the chest.
- Bring your thumbs together in the midline so that they touch but are not fixed to the chest wall. Ask the patient to take a deep breath in.
- Observe the movement of your thumbs (in healthy individuals they should move symmetrically upwards/outwards during inspiration and symmetrically downwards/inwards during expiration).
- Symmetrical reduction : pulmonary fibrosis reduces lung elasticity, restricting overall chest expansion.
- Asymmetrical reduction : pneumothorax, pneumonia and pleural effusion would all cause ipsilateral reduced chest expansion.



Assess
chest
expansion

Causes of reduced expansion:

- Symmetrical | pulmonary fibrosis
- Asymmetrical | pneumothorax, pneumonia, pleural effusion

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Palpation

5- Palpate any chest obvious swelling for Subcutaneous emphysema which is a condition where air becomes trapped under the skin, often resulting from trauma, surgery, or infections (crepitus).

6-Tactile vocal fremitus: assessing tactile vocal fremitus involves palpating over different areas of the chest wall whilst the patient repeats a word or number consistently (e.g. “ninety-nine”) and palpate the chest wall on both sides, using the ulnar border of your hand The presence of increased tissue density or fluid affects the strength at which the patient’s speech is transmitted as vibrations through the chest wall to the examiner’s hands.

-**Increased vibration** over an area suggests increased tissue density (e.g. consolidation, tumour, lobar collapse).

-**Decreased vibration** over an area suggests the presence of fluid or air outside of the lung (e.g. pleural effusion, pneumothorax).

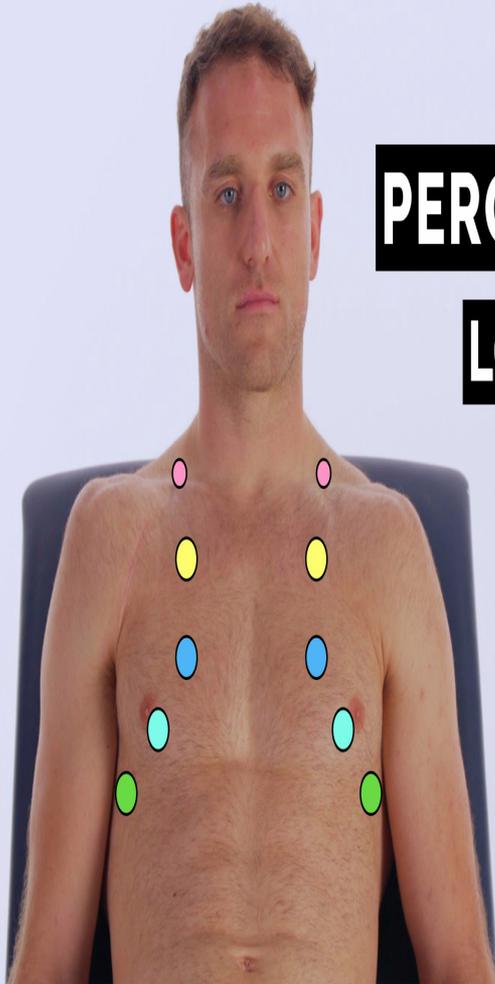
Percussion

- Percussion of the chest involves listening to the volume and pitch of percussion notes across the chest to identify underlying pathology. Correct technique is essential to generating effective percussion notes.
- **1.** Place your non-dominant hand on the patient's chest wall.
- **2.** Position your middle finger over the area you want to percuss, firmly pressed against the chest wall.
- **3.** With your dominant hand's middle finger, strike the middle phalanx of your non-dominant hand's middle finger using a swinging movement of the wrist.
- **4.** The striking finger should be removed quickly, otherwise, you may muffle the resulting percussion note.
- **Resonant:** a normal finding .
- **Dullness:** suggests increased tissue density (e.g. cardiac dullness, consolidation, tumour, lobar collapse).
- **Stony dullness:** typically caused by an underlying pleural effusion.
- **Hyper-resonance:** the opposite of dullness, suggestive of decreased tissue density(e.g. pneumothorax) .



PERCUSSION

LOCATIONS



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Percuss the chest

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Now playing 
Resonant percussion notes
Normal finding

Auscultation

- **Technique**
- **1.** Ask the patient to relax and breathe deeply in and out through their mouth (prolonged deep breathing should, however, be avoided).
- **2.** Position the diaphragm of the stethoscope over each of the relevant locations on the chest wall to ensure all lung regions have been assessed and listen to the breathing sounds during inspiration and **expiration**. Assess the **quality** and **volume** of breath sounds and note any **added sounds**.
- **3.** Auscultate each side of the chest at each location to allow for direct comparison and increased sensitivity at detecting local abnormalities.

1- Quality of breath sounds

- **Vesicular:** the normal quality of breath sounds in healthy individuals.
- **Bronchial:** harsh-sounding (similar to auscultating over the trachea), inspiration and expiration are equal and there is a pause between. This type of breath sound is associated with consolidation.

2-Volume of breath sounds

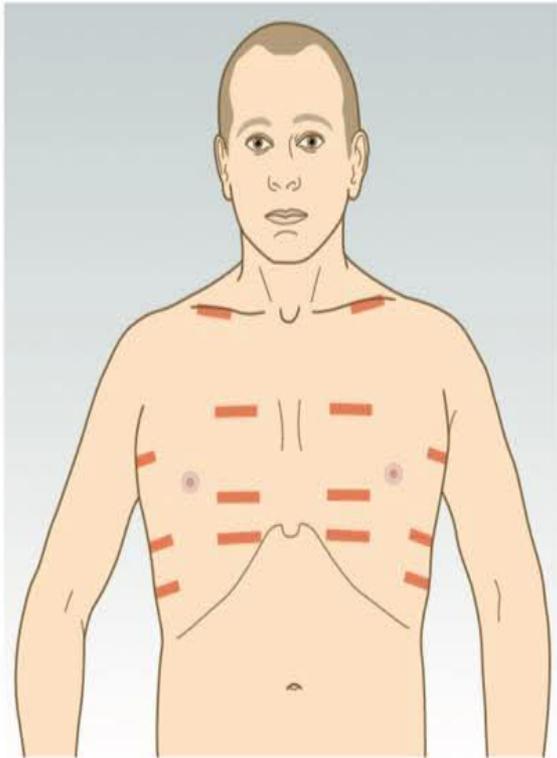
- **Quiet breath sounds:** suggest reduced air entry into that region of the lung (e.g pleural effusion, pneumothorax).
- When presenting your findings, state 'reduced breath sounds', rather than 'reduced air entry'.

3- Added sounds

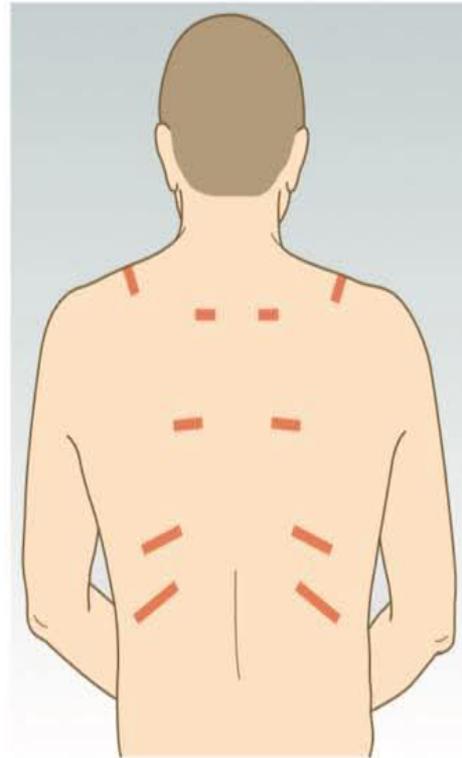
- **Wheeze:** a continuous, coarse, whistling sound produced in the respiratory airways during breathing. Wheeze is often associated with asthma, COPD and bronchiectasis.
- **Stridor:** a high-pitched extra-thoracic breath sound resulting from turbulent airflow through narrowed upper airways. Stridor has a wide range of causes, including foreign body inhalation (acute) and subglottic stenosis (chronic).
- **Coarse crackles:** discontinuous, brief, popping lung sounds typically associated with pneumonia, bronchiectasis and pulmonary oedema.
- **Fine end-inspiratory crackles:** often described as sounding similar to the noise generated when separating velcro. Fine end-inspiratory crackles are associated with pulmonary fibrosis.
- **Pleural rub :** an audible grating superficial sound, often likened to the creaking of leather or the squeaking of a shoe on wet surfaces, that serves as a distinctive clinical sign indicative of pleural inflammation and is commonly associated with conditions such as pleurisy, pneumonia, a pulmonary embolism, and malignancy.



	Pleural rub	Crackles
Site	Superficial & Loud	Deep
	Continuous	Discontinuous
	Localised	Wide area
Coughing	No change	Intensified or Abolished by coughing
Pressure of stethoscope over chest	Increases	No change
Pain & Tenderness	Present	No



B



C

Anterior and lateral sites. **C** Posterior sites.

Examination of posterior chest

- With the patient still sitting forwards, ask them to **fold their arms across their chest** so that their hands are touching the **opposite shoulder**. This results in rotation of the scapulae to better expose the underlying chest wall for assessment.
- Assess the **posterior chest** including **inspection, chest expansion** , **percussion, tactile vocal fremitus** (or vocal resonance) and **auscultation** .

Summary

OSCE example 2: Respiratory examination

Mr Tate, 82 years old, reports increasing breathlessness over several weeks.

Please examine his respiratory system

- Introduce yourself and clean your hands.
- Note clues around the patient, such as oxygen, nebulisers, inhalers or sputum pots.
- Observe from the end of the bed:
 - Scars, chest shape, asymmetry, pattern of breathing, accessory muscle use.
 - Chest wall movement, paradoxical rib movement, intercostal indrawing.
- Examine the hands: clubbing, tar staining, muscle wasting.
- Check for tremor and flap.
- Measure respiratory rate unobtrusively.
- Examine the face: anaemia, cyanosis, Horner's syndrome and superior vena cava obstruction.
- Examine the neck: jugular venous pressure, tracheal deviation, cricosternal distance.
- Examine the anterior chest wall:
 - Palpate: apex beat, right ventricular heave, expansion of the upper and lower chest.
 - Percuss: compare right with left, from top with bottom, then axillae.
 - Auscultate: deep breaths; compare right with left, from top with bottom, then axillae. Repeat, checking vocal resonance.
- Examine the posterior chest wall (commonly in OSCEs, you may be directed to examine either anterior or posterior):
 - Ask the patient to sit forwards.
 - Inspect the back for scars, asymmetry and so on.
 - Palpate:
 - Cervical lymph nodes.
 - Chest expansion of the upper and lower chest.
 - Percuss: ask the patient to fold his arms at the front to part the scapulae; compare right with left, from top to bottom.
 - Auscultate: deep breaths; compare right with left, from top to bottom, then axillae. Repeat, checking vocal resonance.
- Check for pitting oedema over the sacrum and lumbar spine.
- Thank the patient and clean your hands.

Summarise your findings

The patient has finger clubbing, a raised respiratory rate, and diminished expansion with dullness to percussion and loss of breath sounds at the right base. A small scar suggests prior pleural aspiration.

Suggest a differential diagnosis

Signs suggest a large right pleural effusion.

(Away from patient's bedside) A large unilateral effusion with finger clubbing suggests an underlying neoplasm. Alternatives include chronic empyema and tuberculous effusion.

Suggest initial investigations

Chest X-ray to confirm effusion and possibly show an underlying tumour. Ultrasound to reveal pleural disease and loculation, and guide aspiration. Pleural aspiration for cytology, culture and biochemical analysis.

Finally

- <https://www.youtube.com/watch?v=trSNeIVPg74>

Thank you