

An Illustrated Guide For Respiratory System Examination

Bedside Teaching for 2nd year medical Students



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Respiratory System Examination

Inspection

- 1- Shape of the chest
2. Symmetry
3. Position of mediastinum
 - a. Trachea
 - b. Apex beat.
4. Movements with respiration
 - a. Rate
 - b. Rhythm
 - c. Type
5. Scars
6. Pulsations
7. Prominent blood vessels

Palpation

1. Position of mediastinum
 - a. Trachea
 - b. Apex
 - c. Tracheal tug.
2. Movements: Compare and measure both sides
3. Vocal fremitus
4. Intercostal space tenderness.

Percussion

1. Superficial cardiac dullness
2. Upper border of the liver
3. All over the chest on both sides over the lung and pleural area
4. Shifting dullness especially in hydro-pneumothorax

Auscultation

1. Type of breath sounds
2. Adventitious sounds
3. Vocal resonance
4. Aeogophony/bronchophony

Before Examination :

Wash hands

Introduce yourself

Confirm patient details – *name / DOB*

Explain the examination

Gain consent

Expose the patient's chest

Position patient at 45°

Ask patient if they have pain anywhere before you begin!



General Examination

GENERAL INSPECTION

(take a physical step back and ask patient to take a deep breath and cough)

- Well/unwell
- Bedside clues (sputum pot, inhalers)
- Hydration/nutritional state
- Dyspnoea
- Cachexia
- Accessory muscle use
- General appearance
- Mental state
- Cyanosis
- Pallor
- Signs of respiratory distress
- Signs of specific diseases*

Examination of the Hand

- 1- Temperature** – coldness may indicate peripheral vasoconstriction / poor perfusion
2-Tar staining – history of smoking – *increased risk of COPD / lung cancer*



3- Tremors

Flapping tremor – CO₂ retention – *often seen in patients with type 2 respiratory failure – e.g. COPD*

Fine tremor – can be a side effect of beta 2 agonist use (e.g. salbutamol)



2- Clubbing and peripheral cyanosis

Peripheral cyanosis – bluish discolouration of nails – *indicates oxygen saturations of <85%*

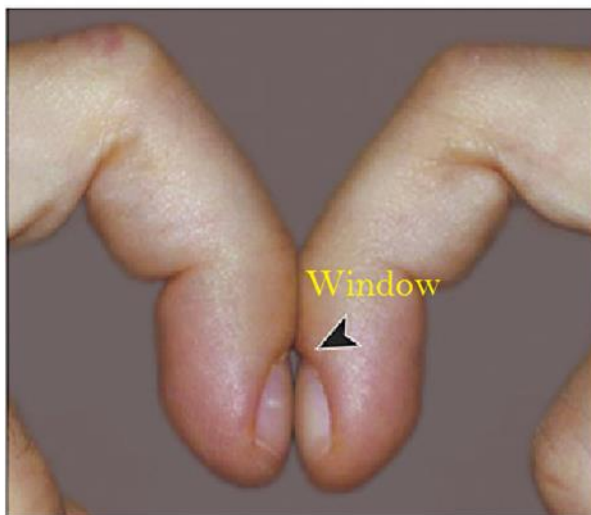
Clubbing – ask patient to place fingernails back to back – *diamond shape is lost – lung ca etc*



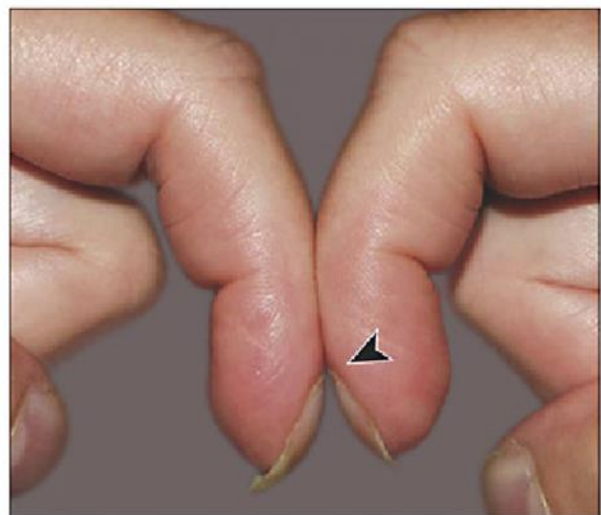
HANDS

- Clubbing
- Muscle wasting
- Tar staining
- Peripheral cyanosis
- Palpate wrist for tenderness
- Check for flap/tremor

Normal



Clubbed



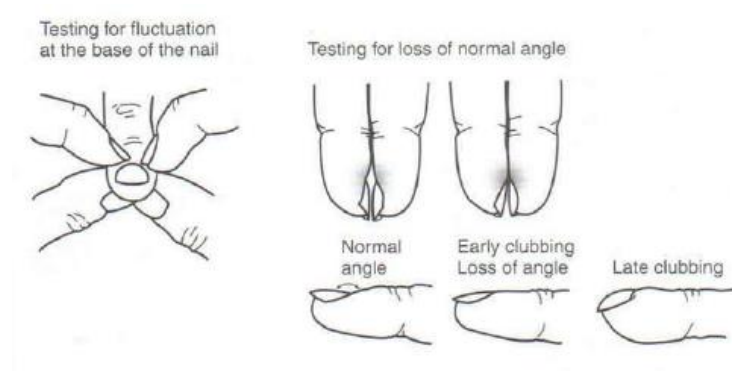


Figure 2-2 Tests for clubbing. (From Lehrer S. *Understanding Lung Sounds*. 3rd ed. Philadelphia: Saunders; 2002 [p. 39, Figure 3-4].)

Examination of Head and Neck

1- Tongue : central cyanosis

Central cyanosis – bluish discolouration of the lips / mucous membranes (*inferior aspect of tongue*)



FACE

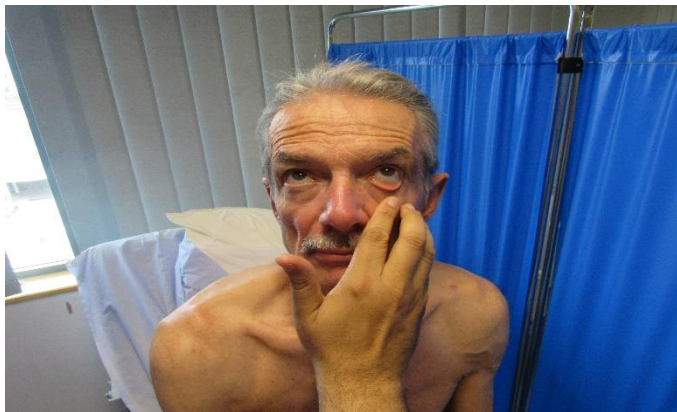
- Eyes Anaemia
 Horner's
 Jaundice
- Mouth Cyanosis
 Pursed lips
- Voice Hoarseness

2- Cervical lymph nodes





3-Conjunctival pallor – ask patient to lower an eyelid to allow inspection – *anaemia*

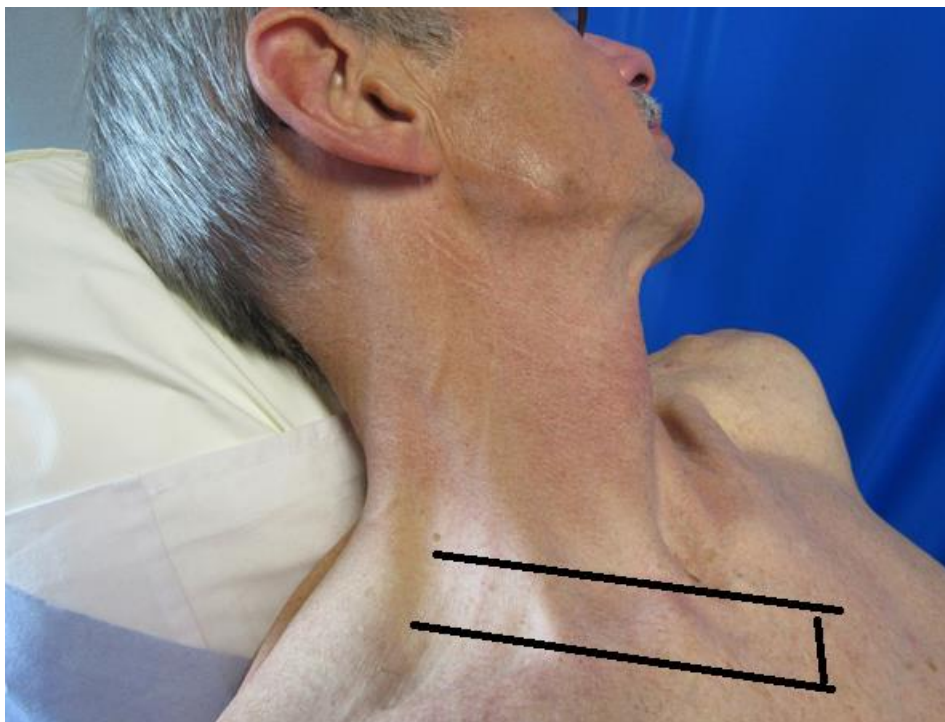
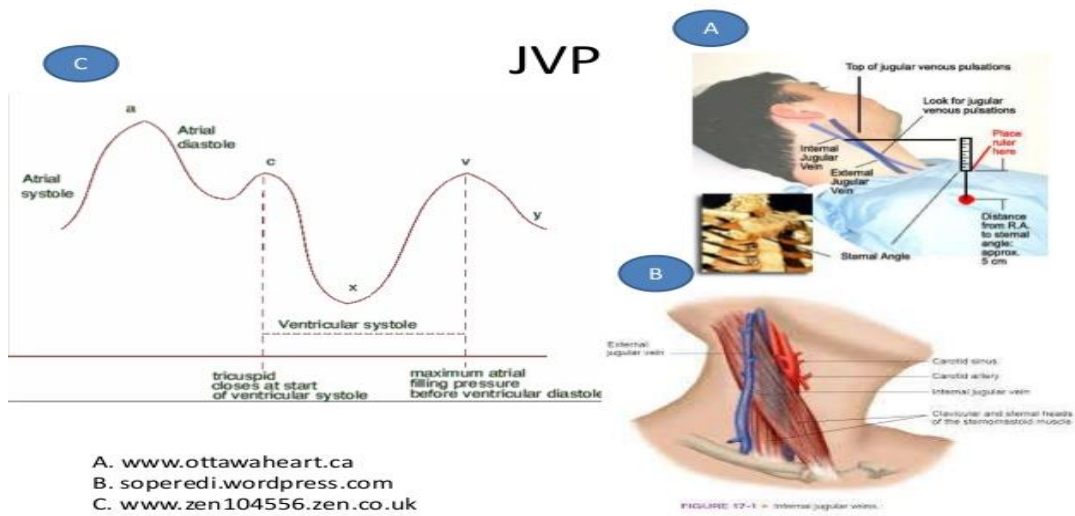


NECK

- JVP
- Distended veins
- Palpate trachea
- Lymphadenopathy

4- Horner's syndrome – ptosis / constricted pupil (*miosis*) /anhidrosis on affected side /enophthalmos

5. Neck veins and carotid arterial pulsations



Lower Limb



Check Lower limb oedema

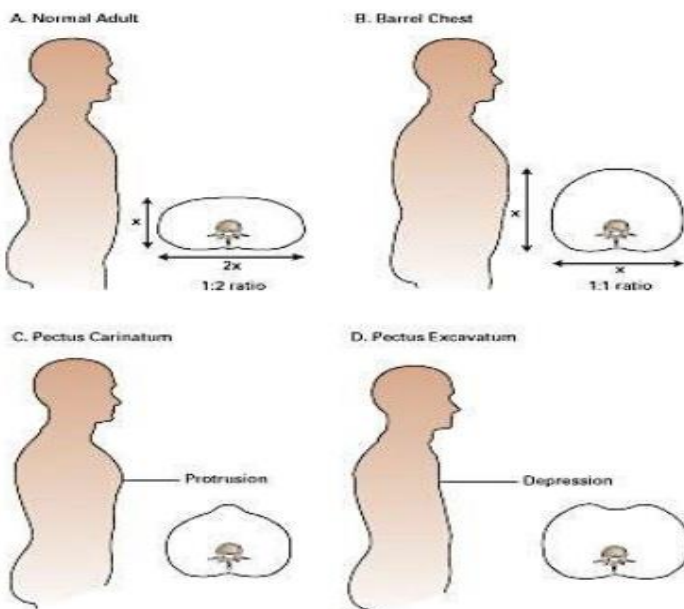


Pitting oedema

Local Respiratory System Examination :

Inspection :

1. Shape of the chest



Shape
of
chest



2. Symmetry : localised bulge or retraction

3. Position of mediastinum

- a. Trachea
- b. Apex beat.

4. Movements with respiration

- a. Respiratory Rate
- b. Rhythm
- c. Type

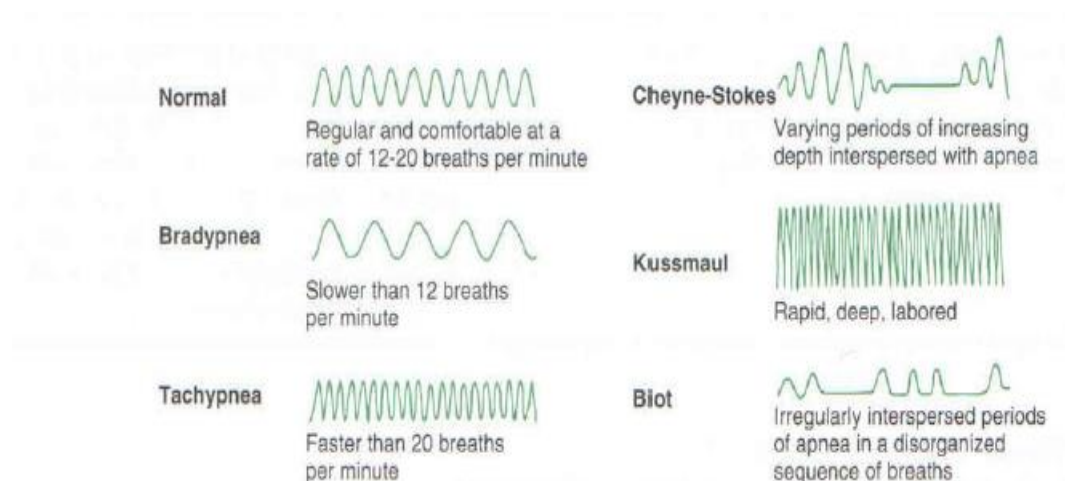


Figure 2-4 Patterns of abnormal breathing. (Adapted from Seidel HM, Ball JW, Dains JE, et al. *Mosby's Guide to Physical Examination*. 5th ed. St. Louis: Mosby; 2003 [p. 372, Figure 12-13].)

5. Scars

6. Pulsations

7. Prominent blood vessels

Palpation:

1. Position of mediastinum

a. Trachea



b. Apex

Apex beat – normal position is 5th intercostal space – mid-clavicular line



2. Movements: Compare and measure both sides

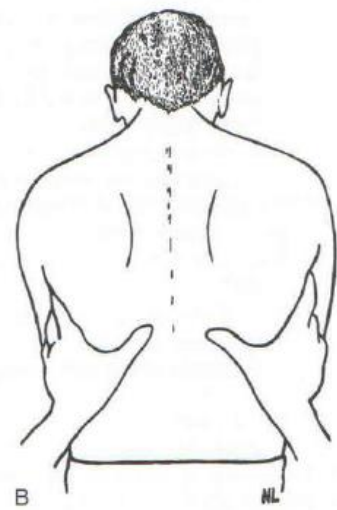


Front : Upper Chest



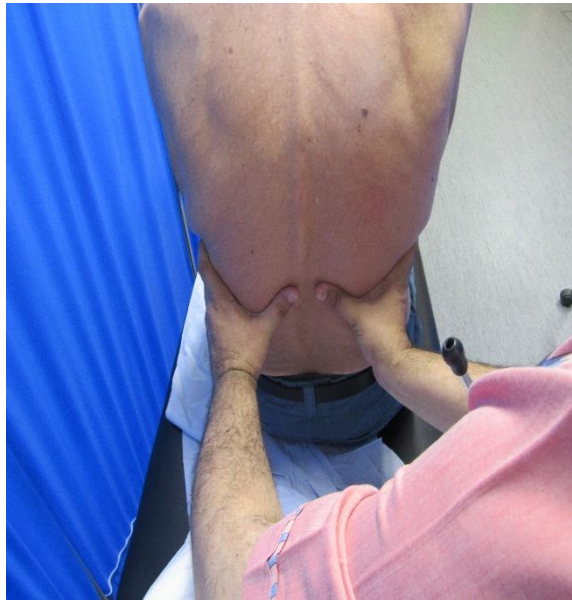
Front: Lower Chest

Technique for palpating chest expansion. **A**, Exhalation. **B**, Maximal inhalation. (From Wilkins RL, Sheldon RL, Krider SJ. *Clinical Assessment in Respiratory Care*. 4th ed. St. Louis: Mosby; 2002 [p. 79, Figure 4-14].)



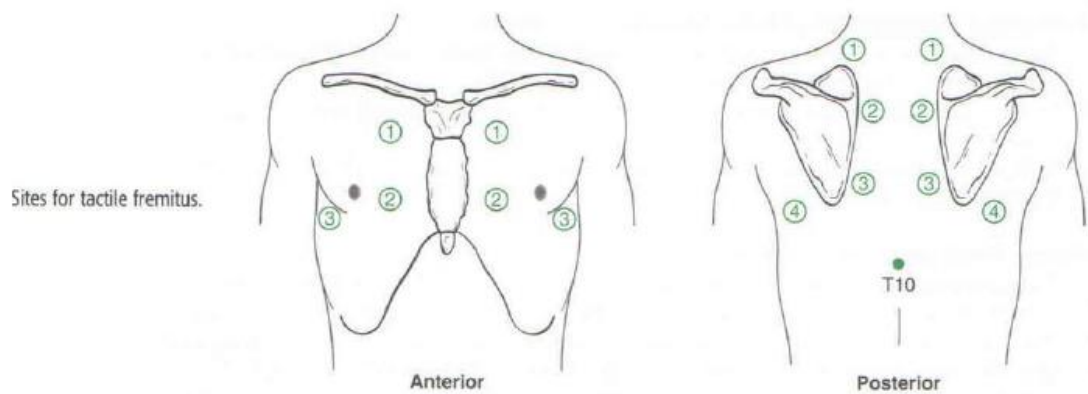
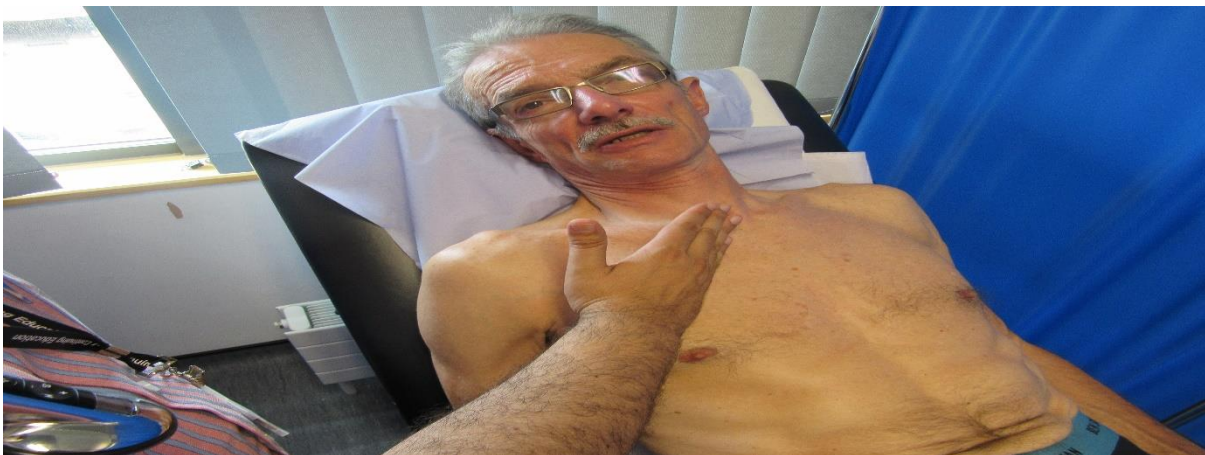


Back: Upper Chest



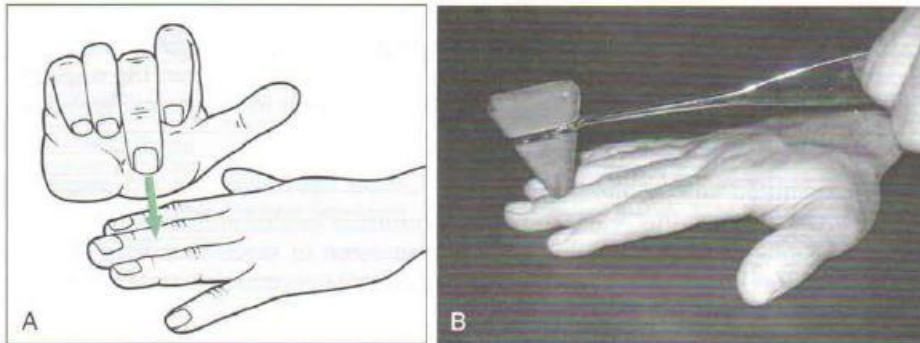
Back : Lower chest

3. Vocal fremitus



4. Intercostal space tenderness.

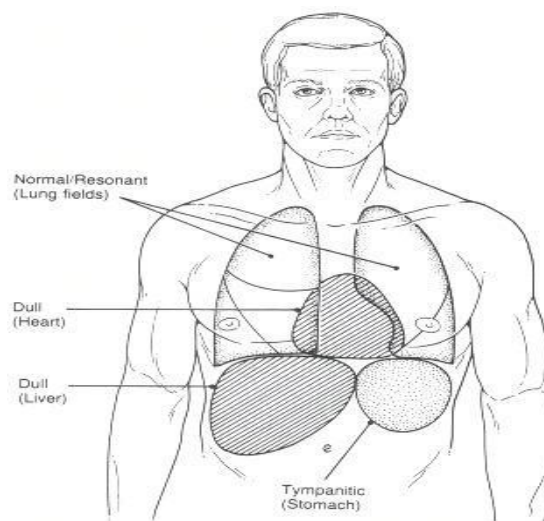
Percussion:

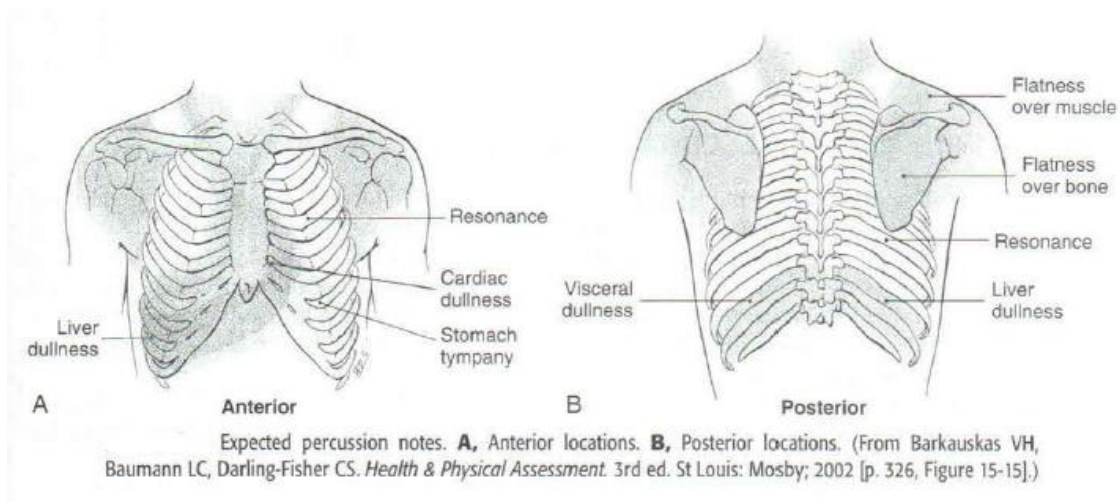


Techniques for percussion. **A**, Traditional (bimanual) technique. **B**, Alternative (reflex hammer) technique. (A, From Munro JF, Campbell IW, eds. *Medeod's Clinical Examination*. 10th ed. Edinburgh: Churchill Livingstone; 2000 [p. 134, Figure 4-16].)

1. Superficial cardiac dullness

2. Upper border of the liver





3. All over the chest on both sides over the lung and pleural area

A. Percuss the front of the chest: supra-mammary , mammary and inframammary areas

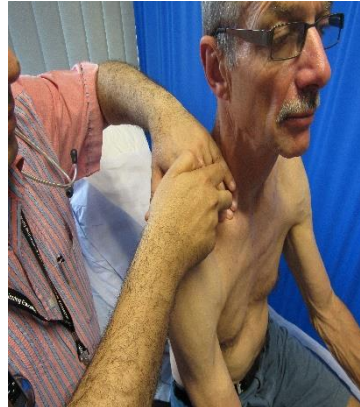
Compare space by space and rib by rib in both sides



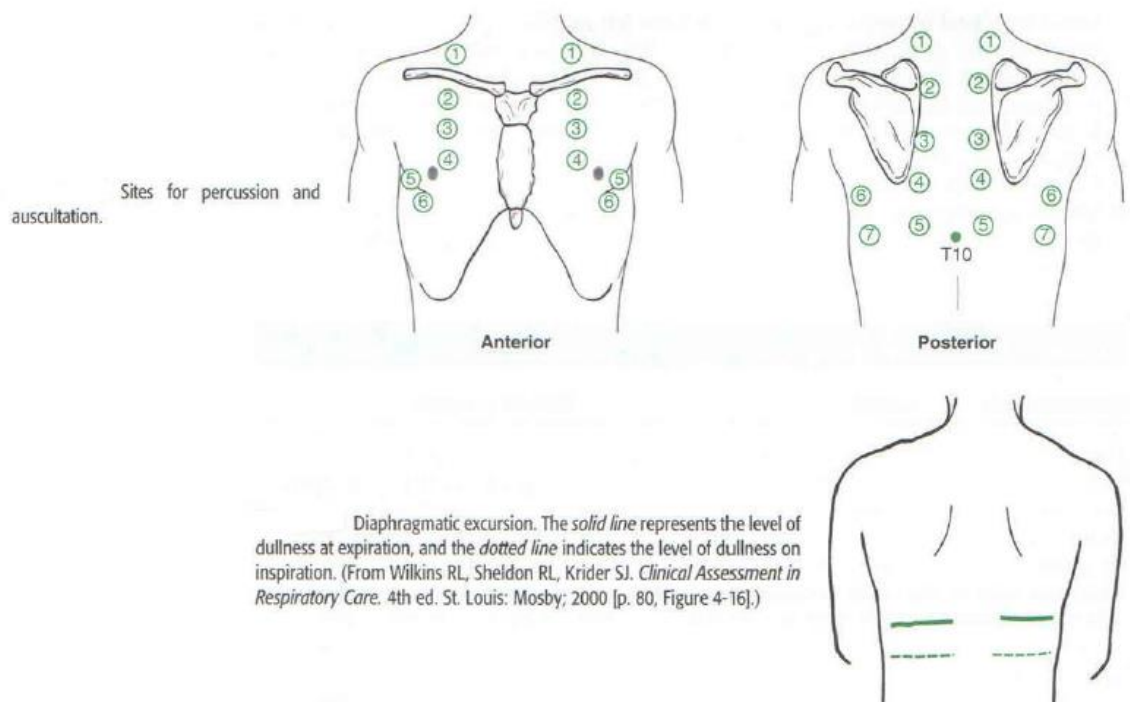
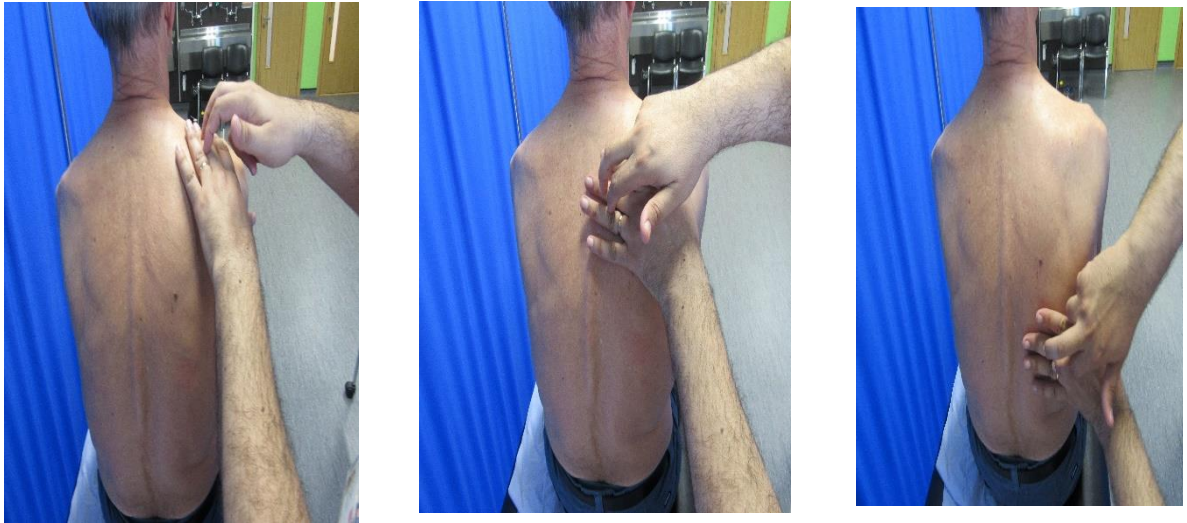
B. Percuss Axilla



C. Percuss lung apex



D. Percuss the back of the chest : Supra-scapular, scapular and infrascapular areas

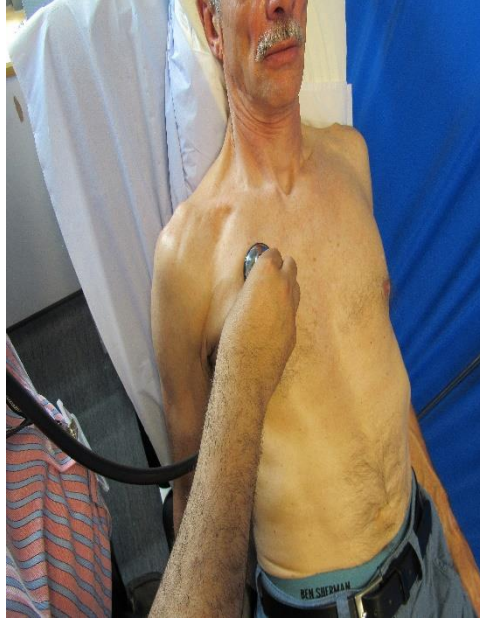


4. Shifting dullness especially in hydro-pneumothorax

Auscultation:




1. Sites of auscultation:

Put the diaphragm of the stethoscope on the same sites of percussion and auscultate

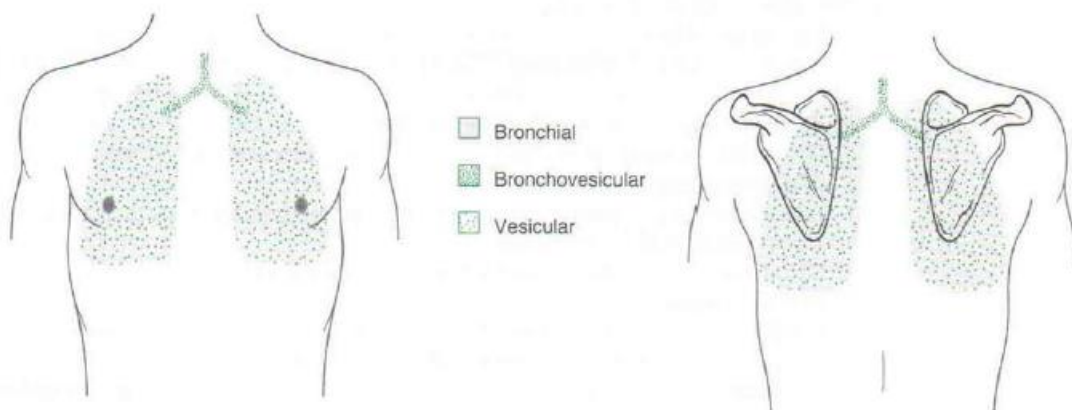


2.Type of breath sounds

Table 2-3 Normal Breath Sounds

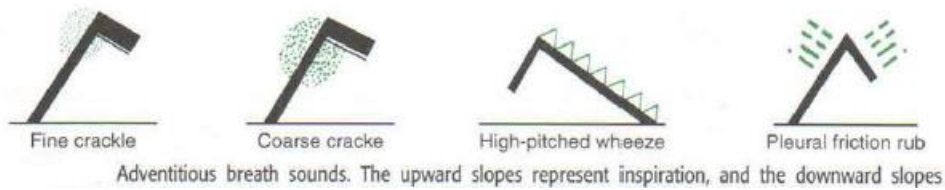
Normal Breath Sounds	Duration	Relative Intensity	Example
Vesicular 	Inspiration > expiration	Soft	Over most of both lungs
Bronchovesicular 	Inspiration = expiration	Intermediate	First and second ICSs anteriorly and between the scapulae
Bronchial 	Inspiration < expiration	Loud	Over the manubrium, if heard at all

ICS, Intercostal space.



Distribution of breath sounds. **Left**, Anterior. **Right**, Posterior.

3. Adventitious sounds



3. Vocal resonance

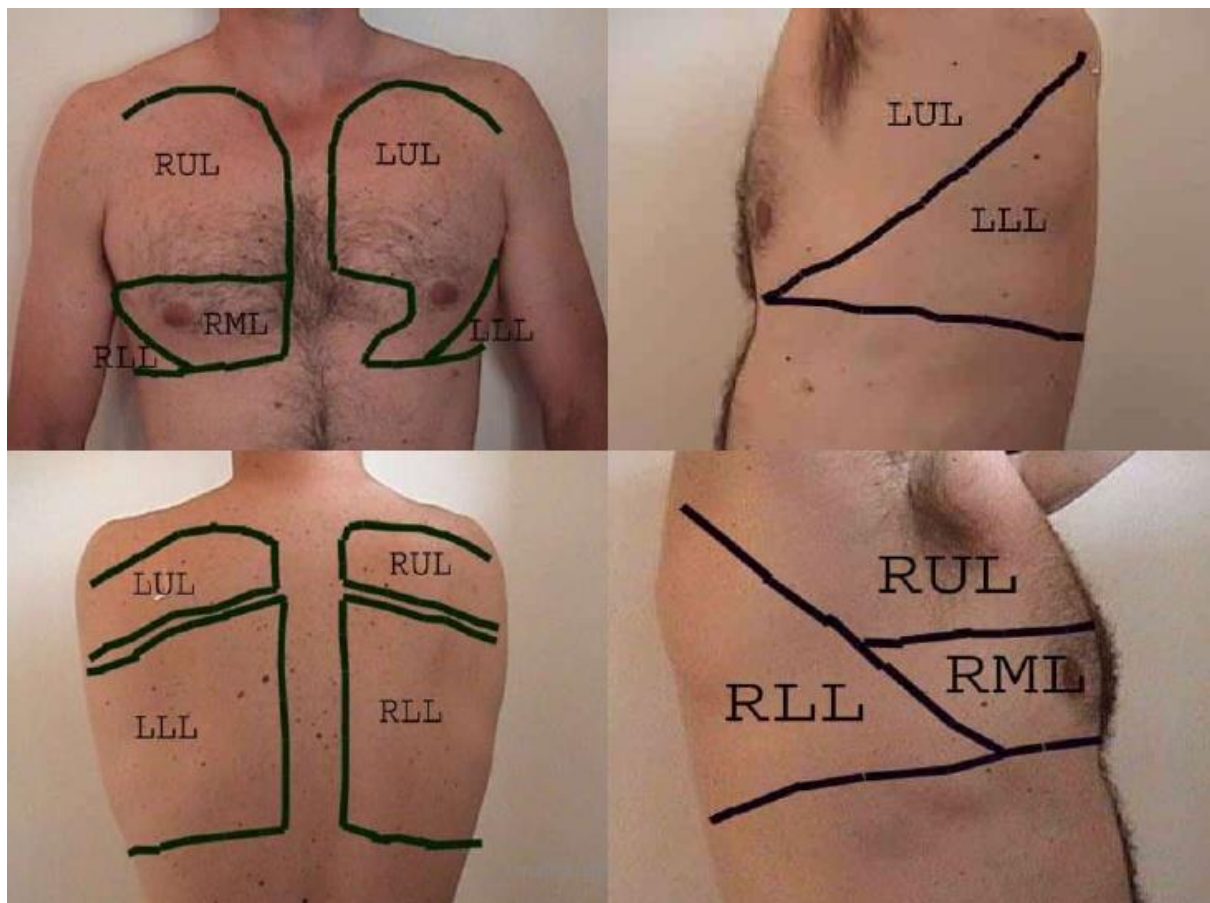
4. Aeogophony/bronchophony

To Listen to different lung auscultatory findings follow this link:

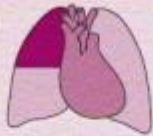
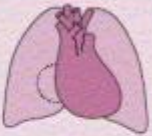
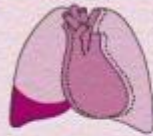
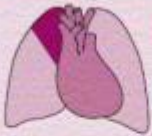

<http://www.easyauscultation.com/lung-sounds-reference-guide>

Additional Informations

1- Surface Anatomy of the lungs:



2- Signs in different chest diseases

Signs found on examination of the respiratory system					
	Consolidation	Pneumothorax	Pleural effusion	Lobar collapse	Pleural thickening
Chest radiograph					
Mediastinal shift and trachea	none	opposit the affected side	none	towards the affected side	none
Chest wall excursion	normal or decreased on the affected side	normal or decreased on the affected side	normal or decreased on the affected side	decreased	decreased
Percussion note	dull	resonant	stony dull	dull	dull
Breath sounds	increased (bronchial)	decreased	decreased	decreased	decreased
Added sounds	crackles	click (occasional)	rub (occasional)	none	none
Tactile vocal fremitus or vocal resonance	increased	decreased	decreased	decreased	decreased

References :

- 1- OSCE And Clinical skills handbook: Hurley KF, second edition.Elsevier Canada 2011
- 2- OSCEs at a glance ,first edition 2013
- 3- Macleod`s clinical examination ,thirteenth ed. 2013
- 4- Step by Step Clinical examination Skills:Iqbal F , first edition 2009