

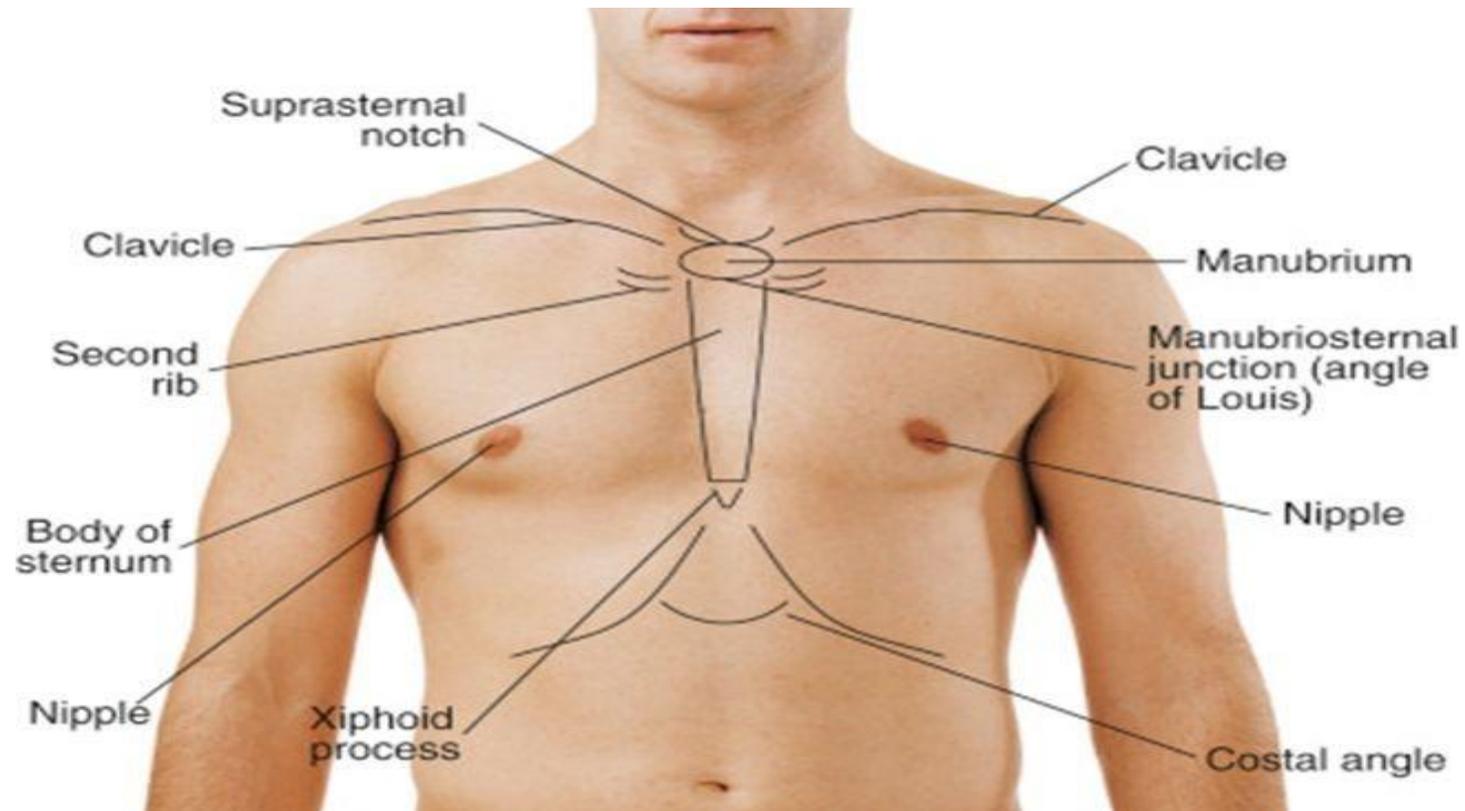


# Chest examination

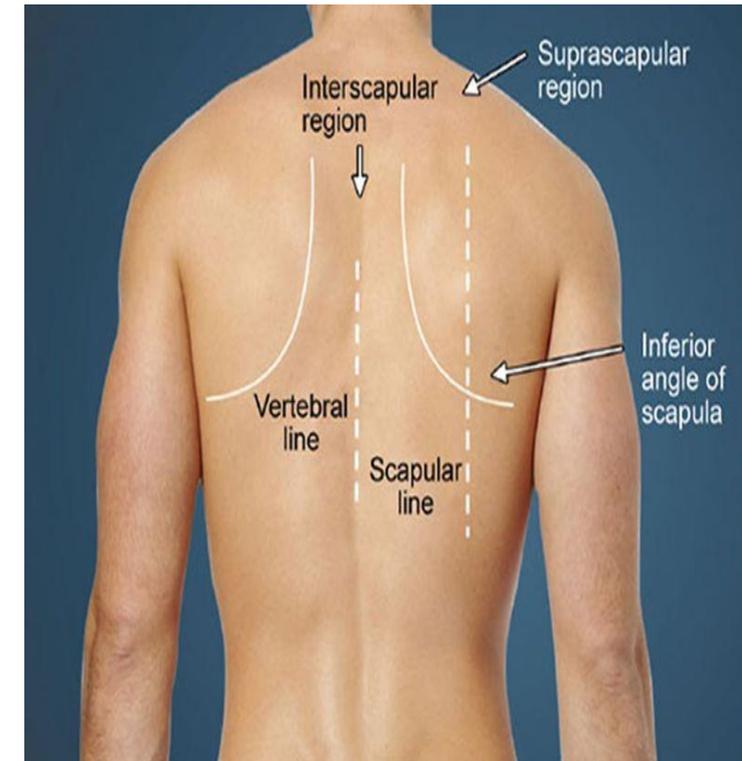
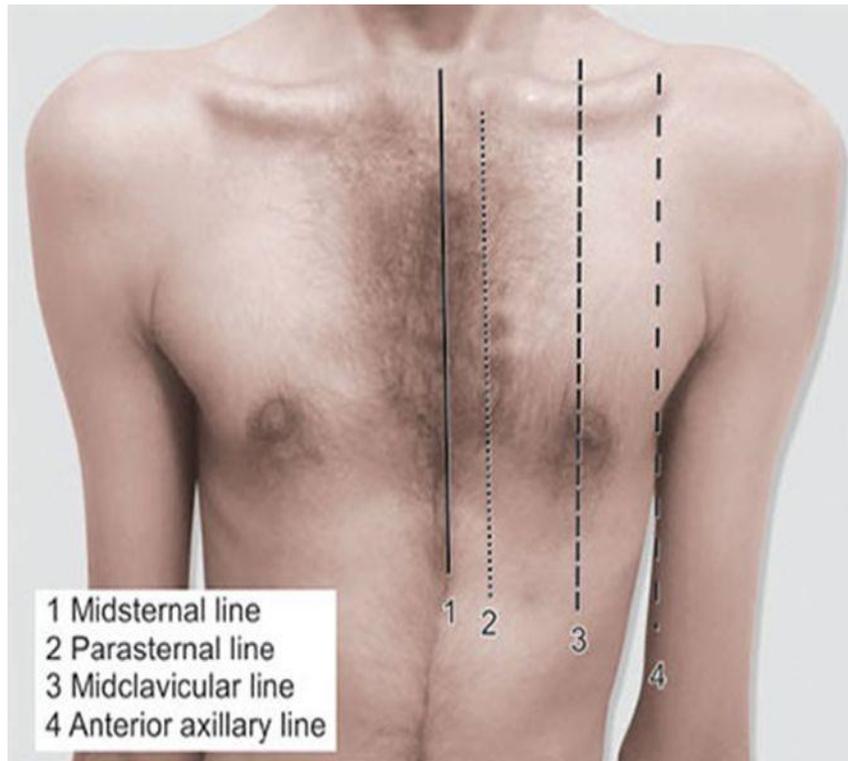
*Prof . Magda Abdelsalam*  
*Prof. Rehab El-Morsy*

*Professor of Chest Medicine*  
*Mansoura University*

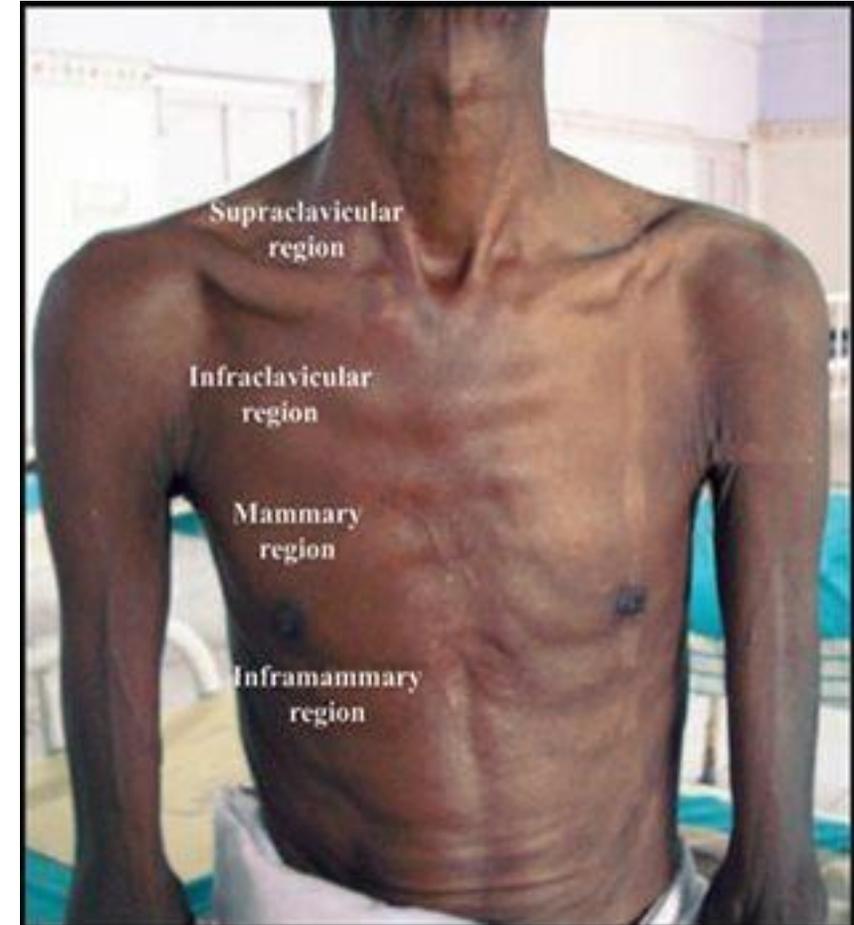
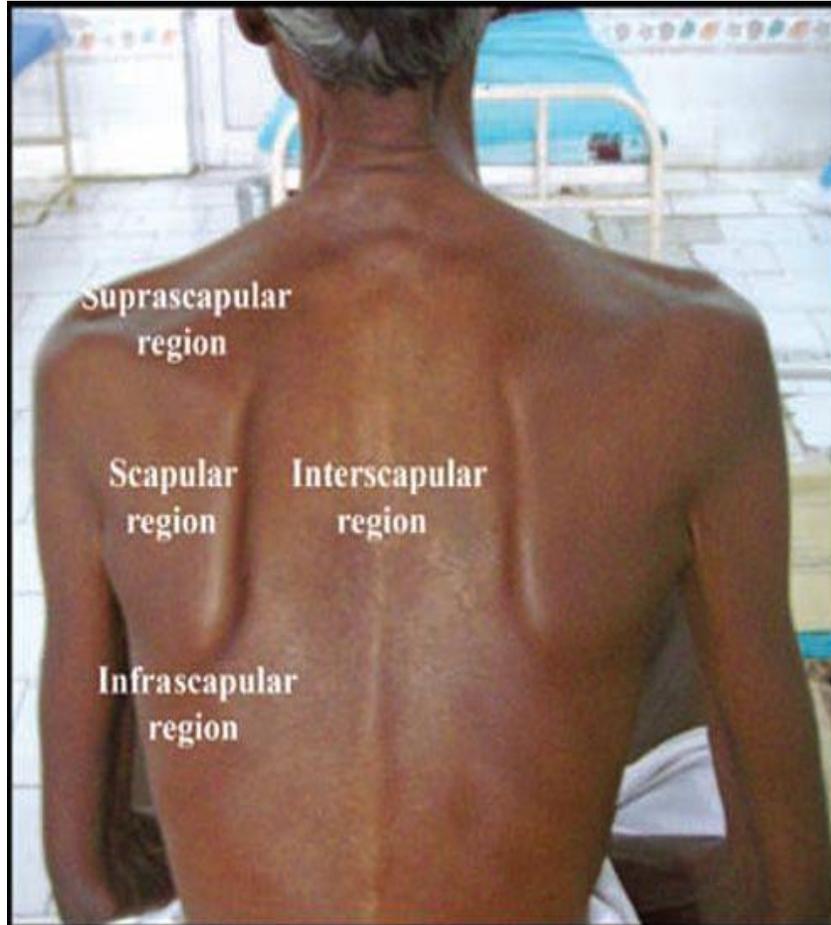
# Important land marks



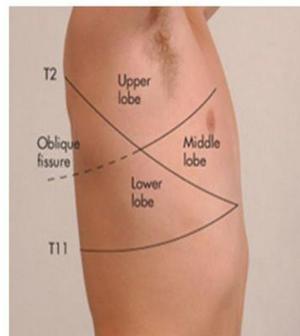
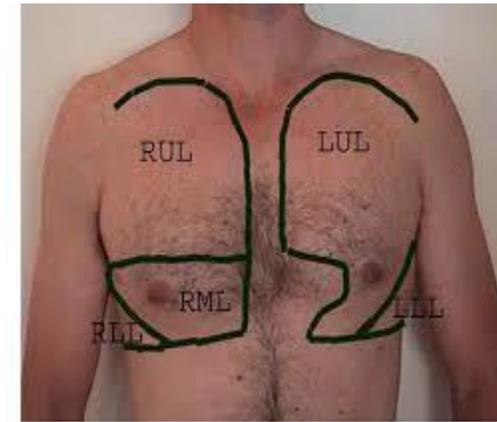
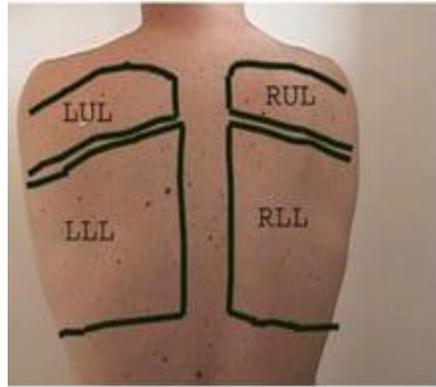
# Imaginary longitudinal lines



# Imaginary chest areas



# Surface anatomy of the lungs



# Local chest examination

- 1 Inspection
- 2 palpation
- 3 percussion
- 4 auscultation





# Chest inspection

- shape of the chest
- symmetry
- respiratory movement
- Pulsation
- dilated veins, pigmentation, sinuses, fistula, nodules, scars of previous operations, skin rashes

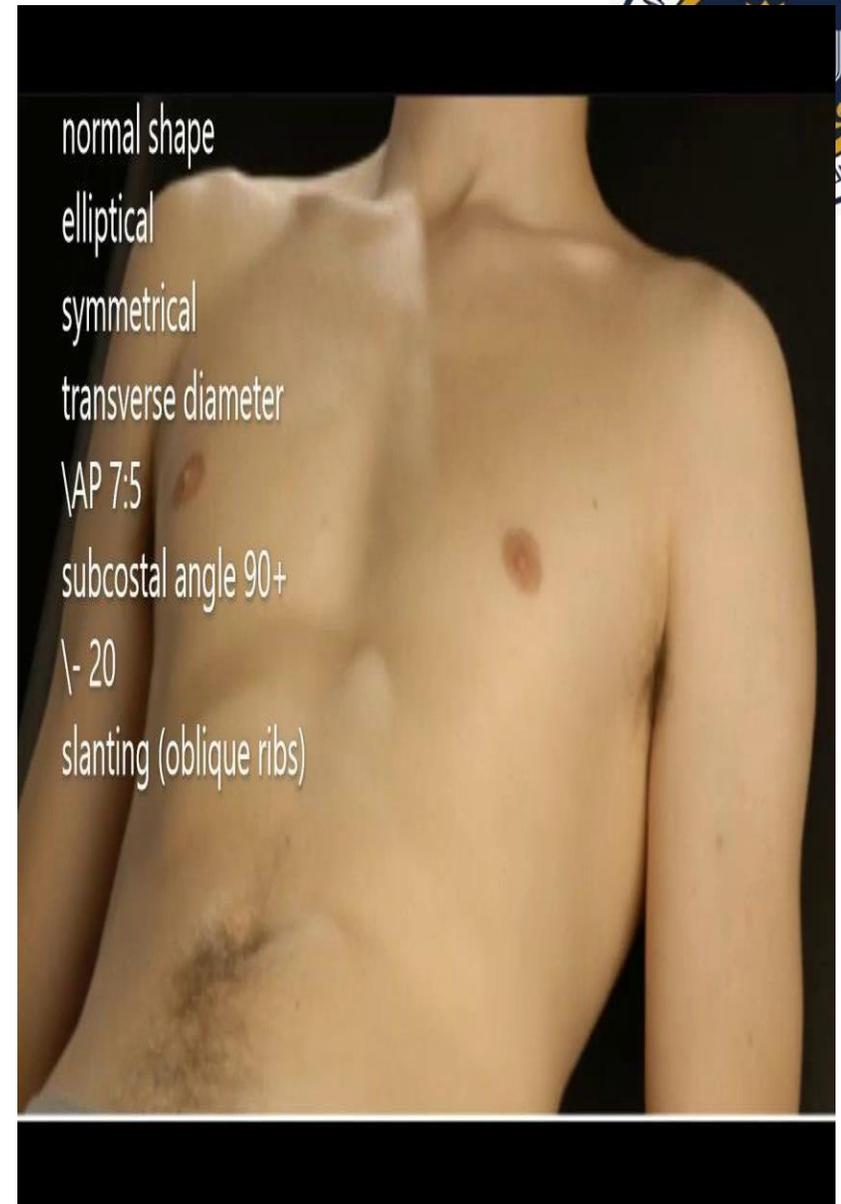


Inspection

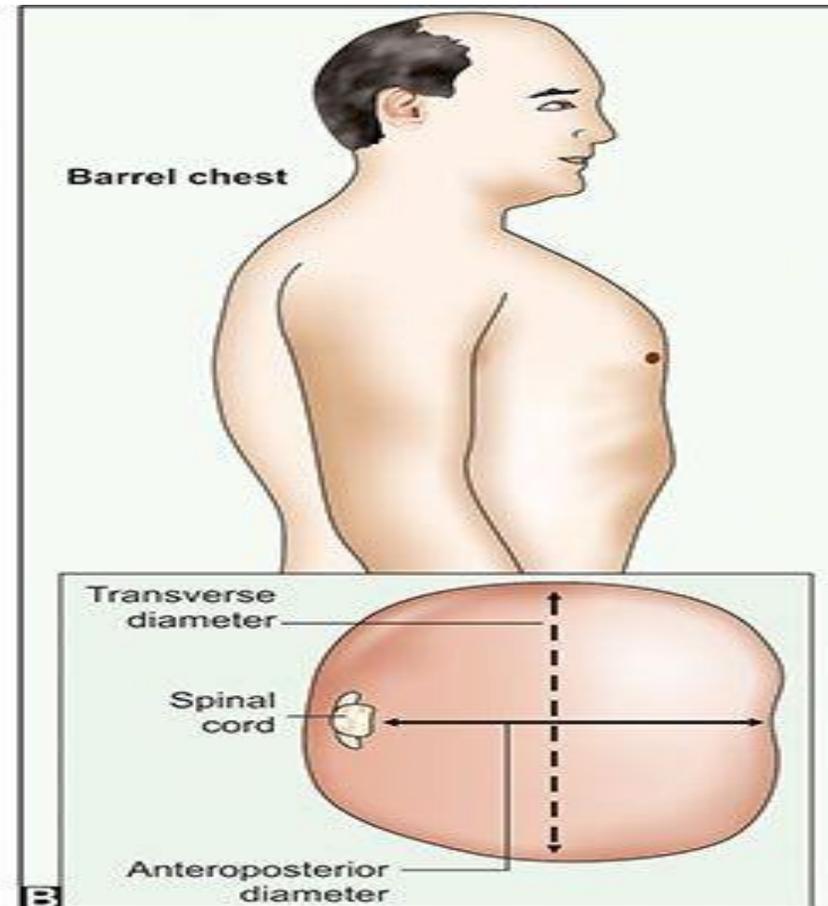
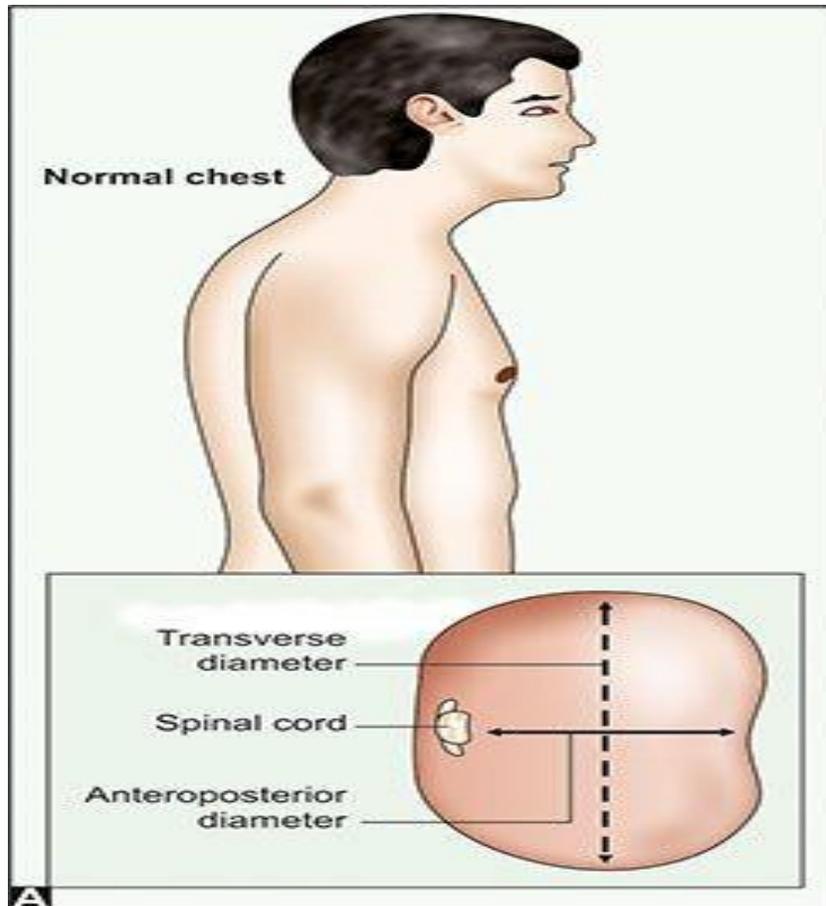
# Shape of the chest

Normal chest has the following criteria:

- Elliptical in shape
- Both halves are symmetrical
- Anteroposterior diameter equals (5/7) of the transverse diameter
- Ribs are oblique and no bulge or retraction during inspiration
- Moves freely with respiration
- Subcostal angle  $90 \pm 20$



# Shape of the chest



# Abnormalities of the shape of the chest

- Barrel shaped chest
- Pigeon shaped chest
- Rachitic chest
- Funnel shaped chest
- Pectus excavatum
- Pectus carinatum
- kyphoscoliosis





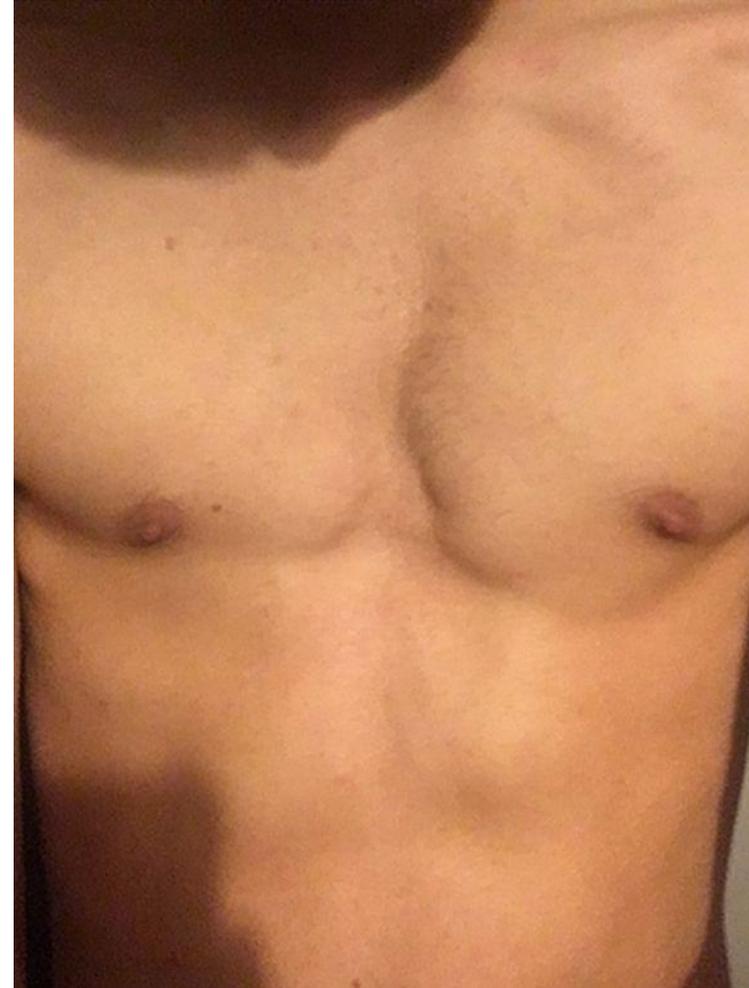
# Symmetry of the chest

- Normal chest is symmetrical



# Abnormalities of the symmetry of the chest

- Bulge
- retraction



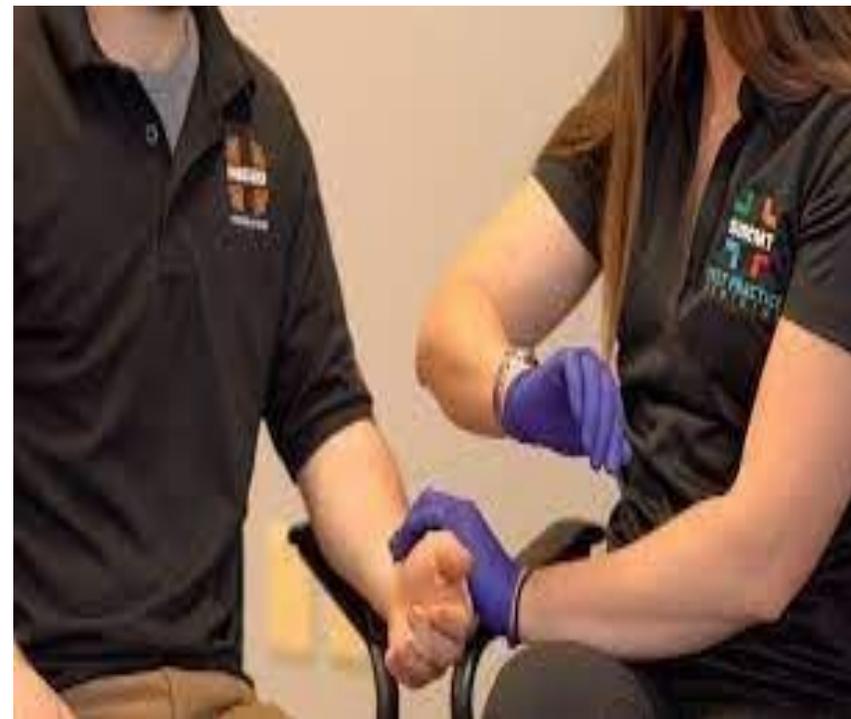
# Respiratory rate

- It is measured by counting chest movement in one minute while diverting the attention of the patient by pretending that you measure the pulse rate to avoid voluntary changes in the rate.
- Normal rate: 12-20 breath per minute



# Pulse- respiratory rate ratio

- Normal ratio: 4:1



Inspection

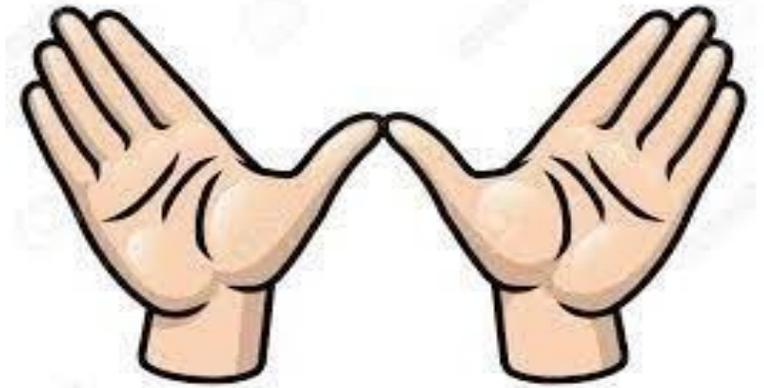
# Degree of chest expansion

- The patient is asked to breath in & out forcibly, then symmetrical areas on both sides is compared while you are standing at bed foot and looking tangentially.



# Palpation of the chest

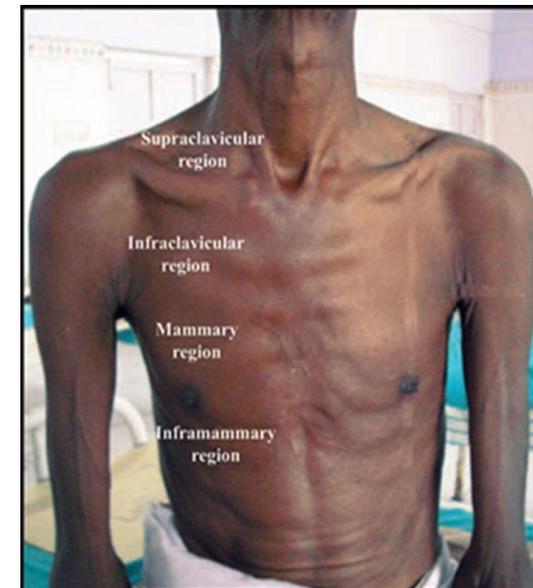
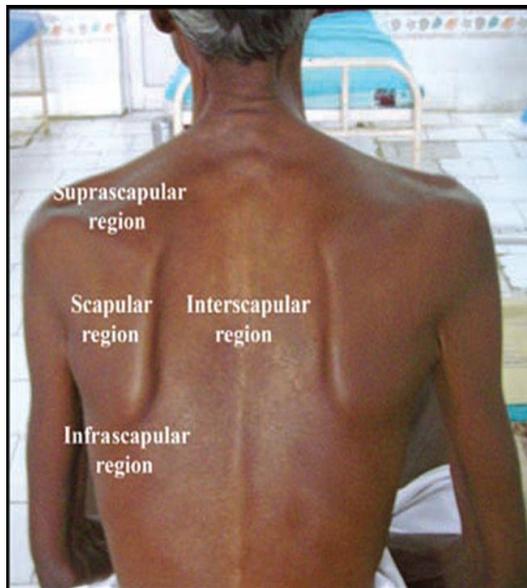
- superficial palpation
- Examination of trachea
- Confirmation of chest movement
- Tactile Vocal Fremitus (TVF)
- Palpable rhonchi or pleural rub
- Confirmation of the origin of pulsation





# Superficial palpation

- By direct tapping by the tips of fingers over the clavicle and all regions of the chest wall to detect crepitus over fractured rib or points of local tenderness.

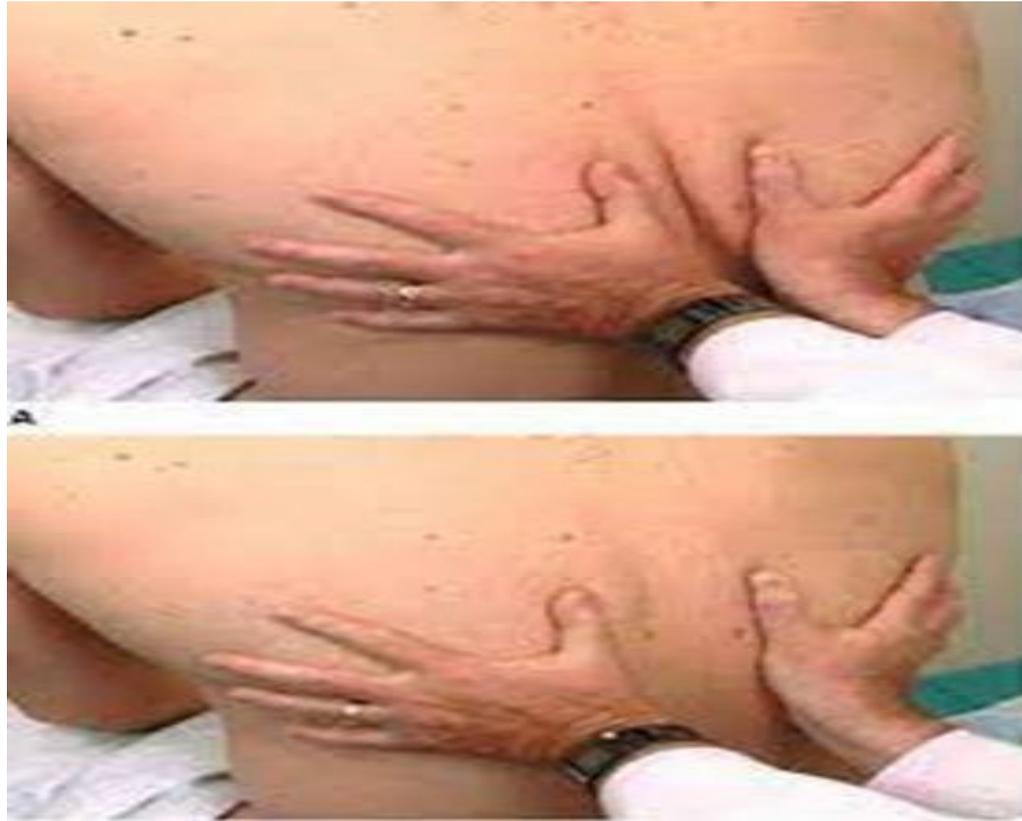


Palpation

# Confirmation of chest movement

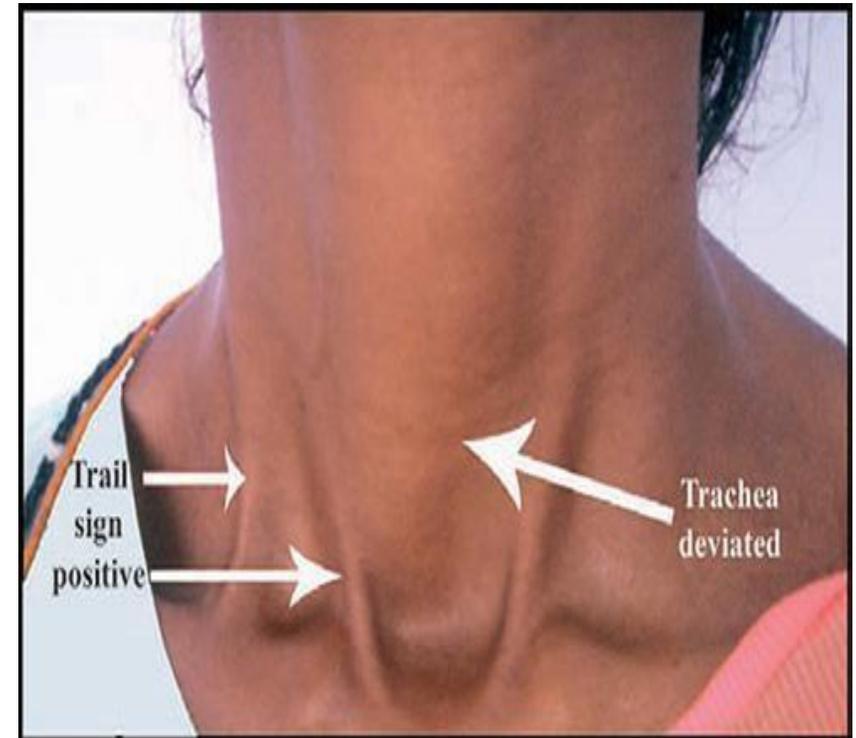


# Confirmation of chest movement



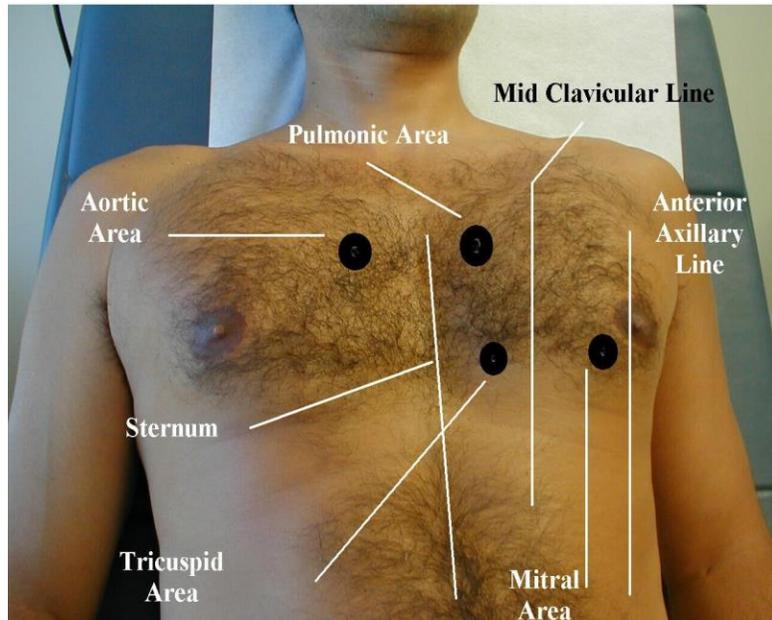
# Tracheal examination

- Alternate palpation of trachea in suprasternal notch by the tip of the index finger.
- The tip of the index finger should be placed in the fossa between the medial aspect of the sternomastoid muscle and the lateral aspect of the trachea .
- The patient is in a the sitting position, leaning forward with the head straight and supporting the head by the left hand.



# Confirmation of the origin of pulsation

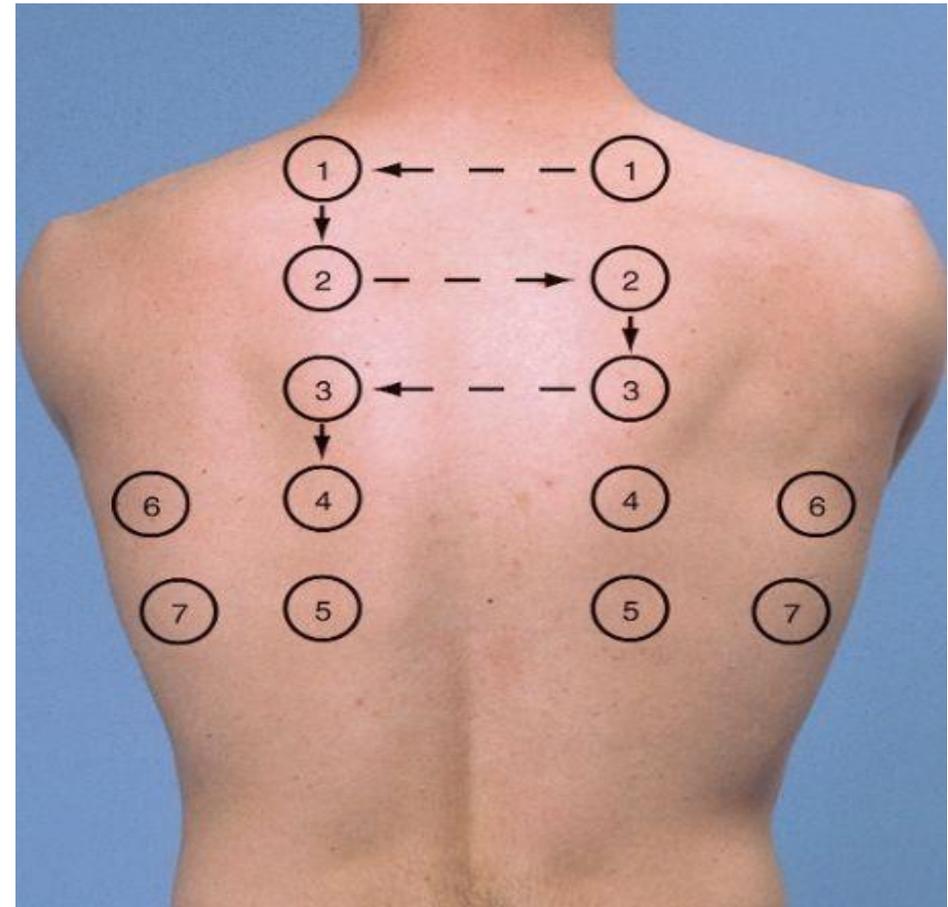
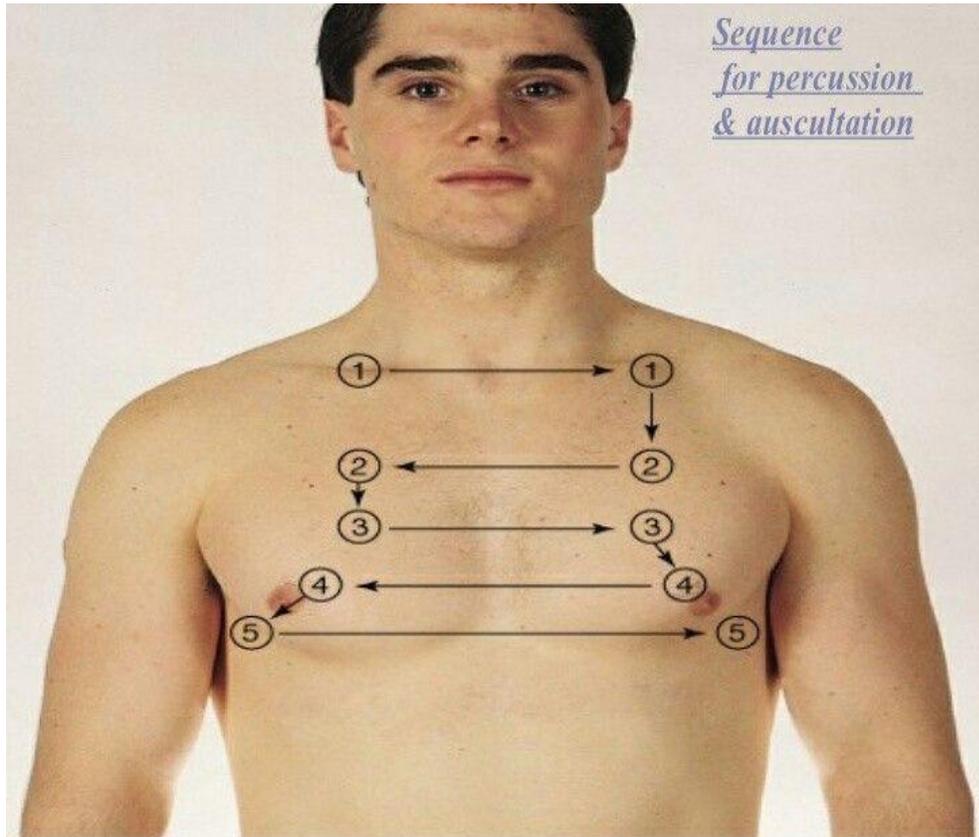
- Left second space: pulmonary artery dilatation
- Right second space : ascending aorta dilatation



# Percussion of the chest



# Sequence of percussion & auscultation



# Types of percussion notes

## Percussion Note

Type of Note	Causes
<b>Tympanitic</b>	<ul style="list-style-type: none"> <li>✦ Hollow viscus (empty stomach)</li> </ul>
<b>Hyper resonant</b>	<ul style="list-style-type: none"> <li>✦ Pneumothorax</li> <li>✦ Emphysema</li> </ul>
<b>Resonant</b>	<ul style="list-style-type: none"> <li>✦ Normal lung</li> </ul>
<b>Impaired</b>	<ul style="list-style-type: none"> <li>✦ Junction of liver, heart with the lung</li> <li>✦ Pulmonary fibrosis</li> <li>✦ Pulmonary consolidation, collapse (some cases)</li> </ul>
<b>Dull</b>	<ul style="list-style-type: none"> <li>✦ Over liver, heart</li> <li>✦ Pulmonary consolidation, collapse (some cases)</li> <li>✦ Pleural thickening</li> </ul>
<b>Stony dull</b>	<ul style="list-style-type: none"> <li>✦ Pleural effusion</li> </ul>





# Technique of chest percussion

## Percussion of the anterior chest

- percussion of the clavicles by direct percussion, normally it is resonant.
- Percussion of the sternum is by direct percussion , normally the upper  $\frac{2}{3}$  sternum give cancellous resonance and the lower  $\frac{1}{3}$  give impaired note.
- percussion of the upper border of the liver, normally dull is present in the RT. 5<sup>th</sup> ICS midclavicular line and 7<sup>th</sup> ICS midaxillary line.
- parasternal lines: comparing each space on both sides.
- Midclavicular lines: normally resonant till 6<sup>th</sup> ICS( lower border of the lung)
- Midaxillary line: normally resonant till 8<sup>th</sup> ICS( lower border of the lung)



# Technique of chest percussion

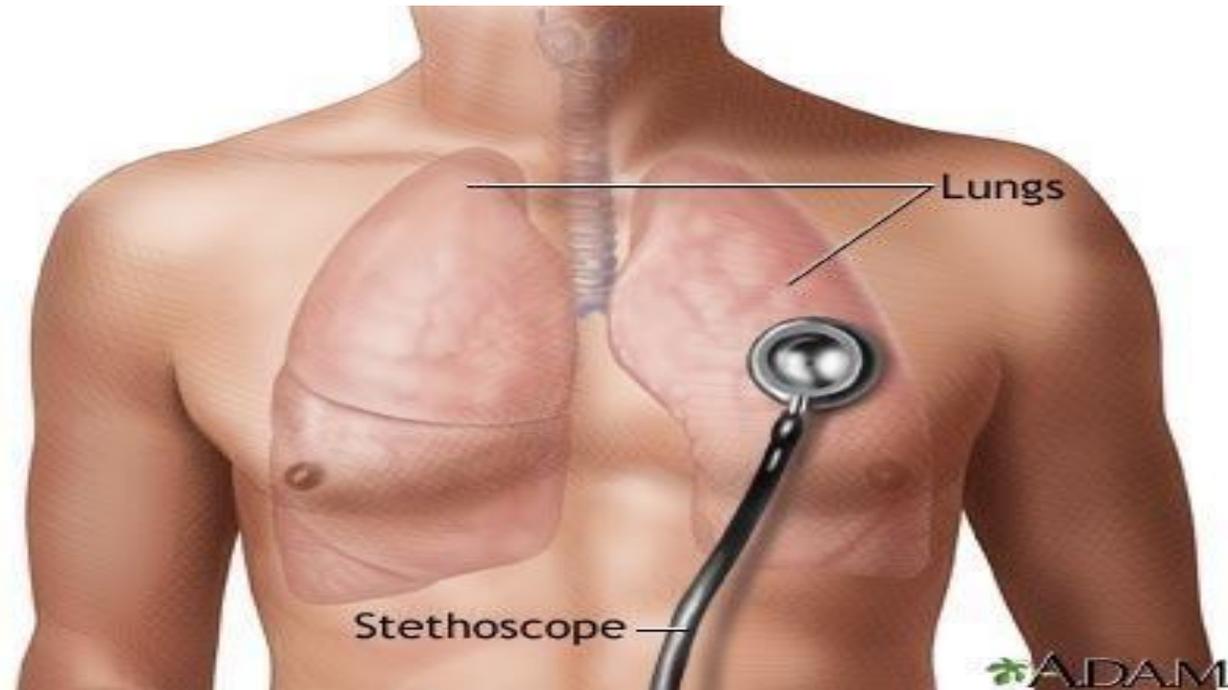
- **Percussion of the posterior chest**
- the scapula covers from 2<sup>nd</sup> to 7<sup>th</sup> rib with the arm at the sides.
- The inferior angle of the scapula is usually at 7<sup>th</sup> intercostal space serving as the usual landmark for counting the ribs in the back.
- Scapular line: normally resonant till 10<sup>th</sup> ICS ( lower border of the lungs)
- Paravertebral lines: normally resonant till 10<sup>th</sup> ICS ( lower border of the lungs)

# Chest auscultation

- Intensity of breath sound
- Type of breath sound
- Vocal resonance
- Adventitious sounds



# Chest auscultation





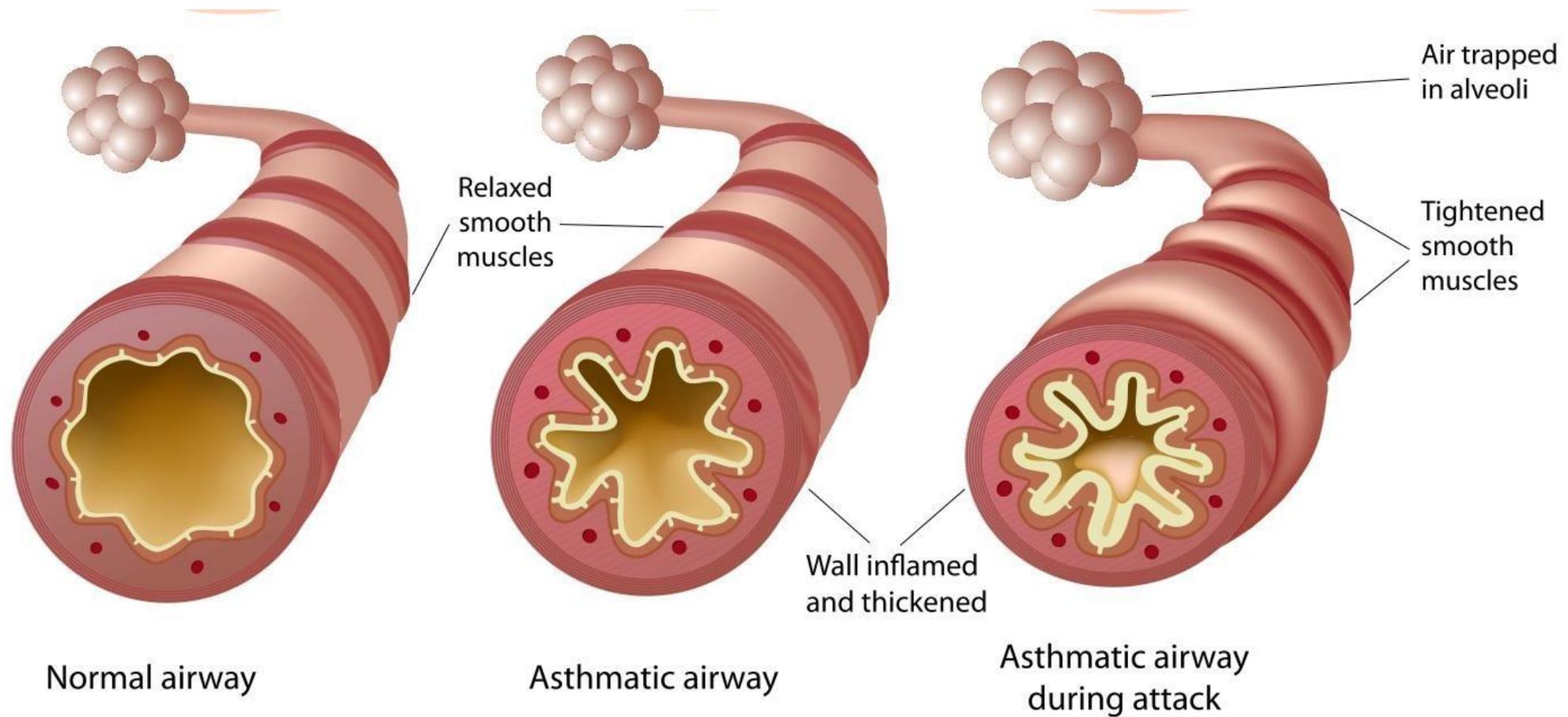
# Characteristics of Breath Sounds



	<b>Duration of Sounds</b>	<b>Intensity of Expiratory Sound</b>	<b>Pitch of Expiratory Sound</b>	<b>Locations Where Heard Normally</b>
<b>Vesicular*</b> 	Inspiratory sounds last longer than expiratory sounds.	Soft	Relatively low	Over most of both lungs
<b>Bronchovesicular</b> 	Inspiratory and expiratory sounds are about equal.	Intermediate	Intermediate	Often in the 1st and 2nd interspaces anteriorly and between the scapulae
<b>Bronchial</b> 	Expiratory sounds last longer than inspiratory ones.	Loud	Relatively high	Over the manubrium, (larger proximal airways)
<b>Tracheal</b> 	Inspiratory and expiratory sounds are about equal.	Very loud	Relatively high	Over the trachea in the neck

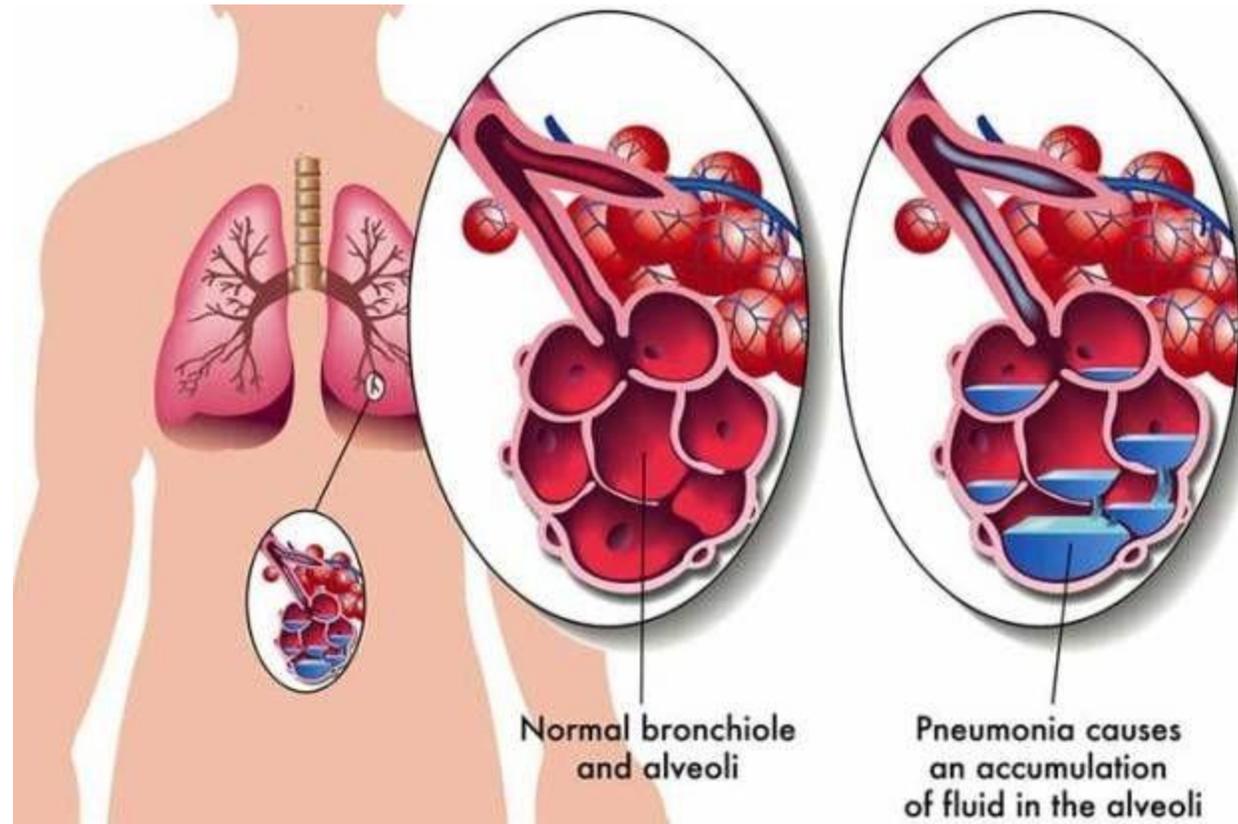
# Adventitious sounds

## Rhonchi ( wheezes)



# Adventitious sounds

## Crackles( crepitation)



THANK  
YOU  
DOCTORS!

