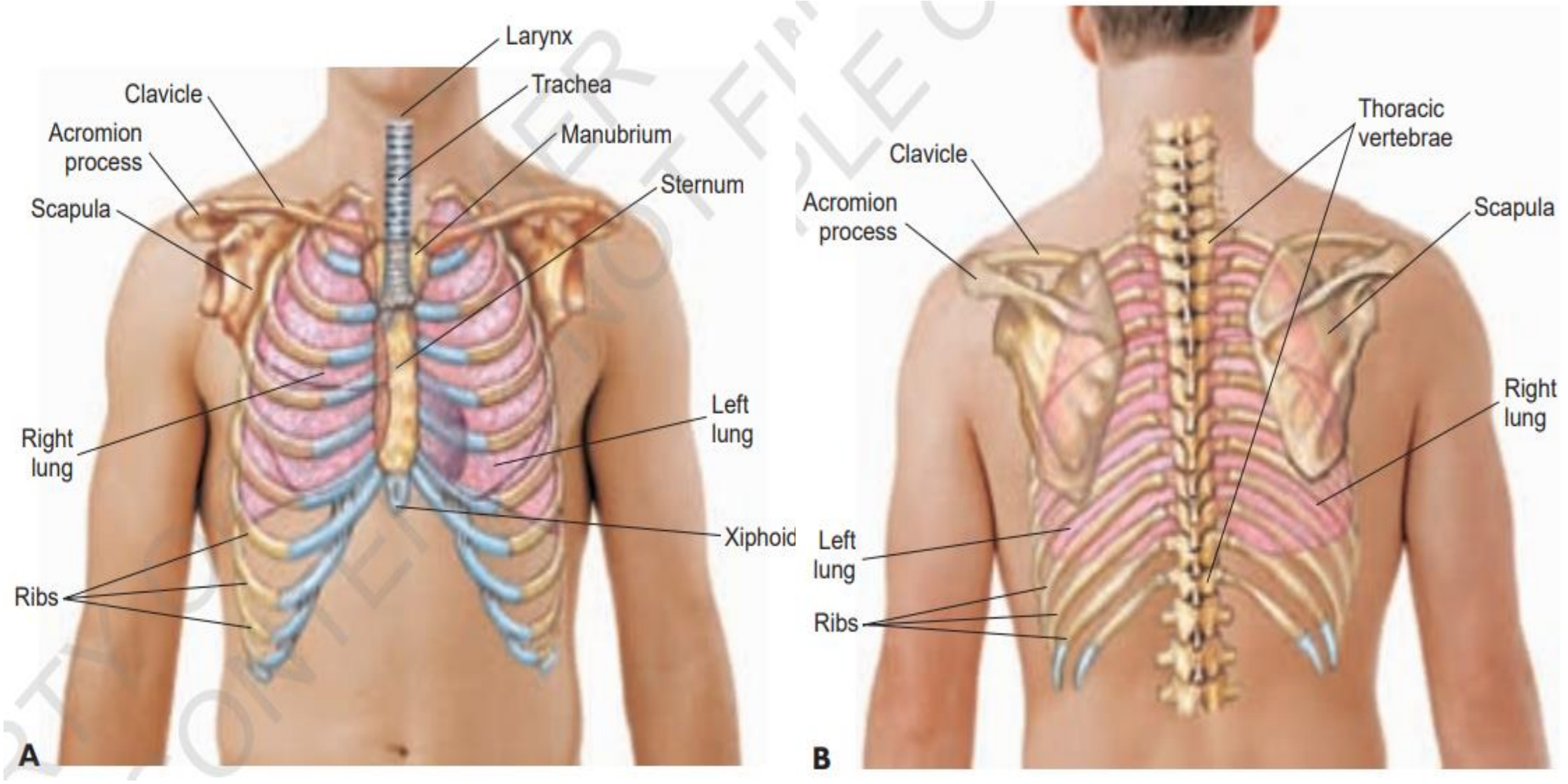
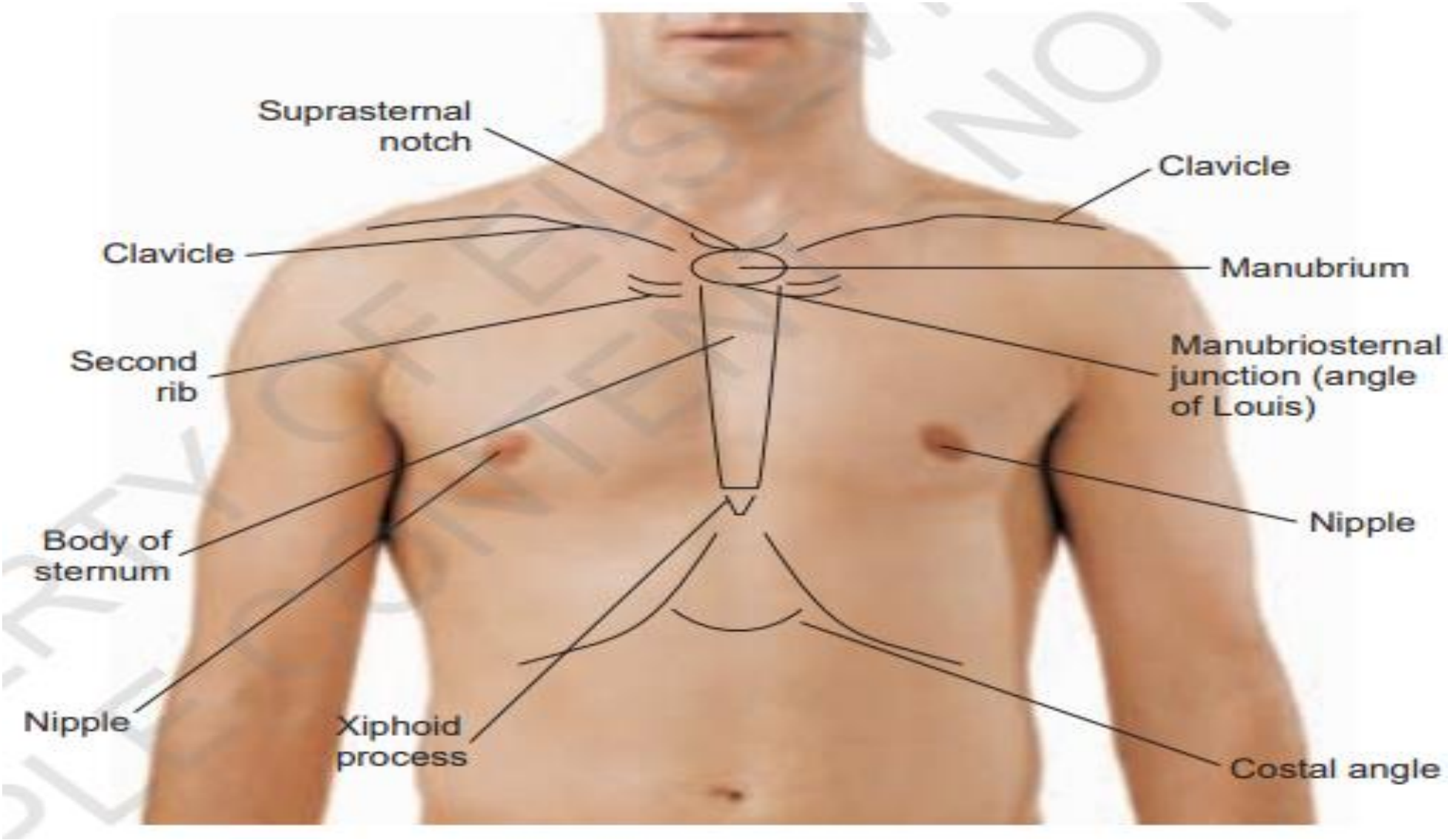
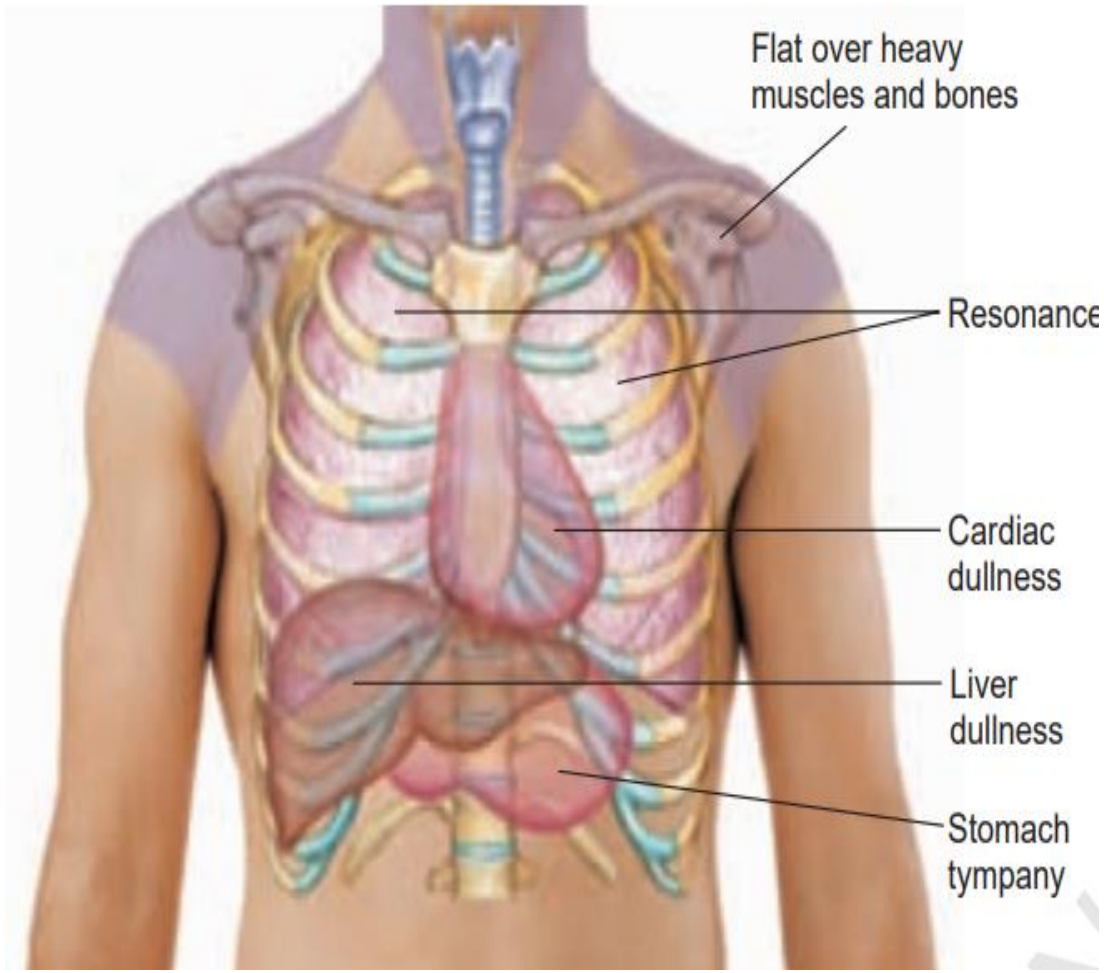
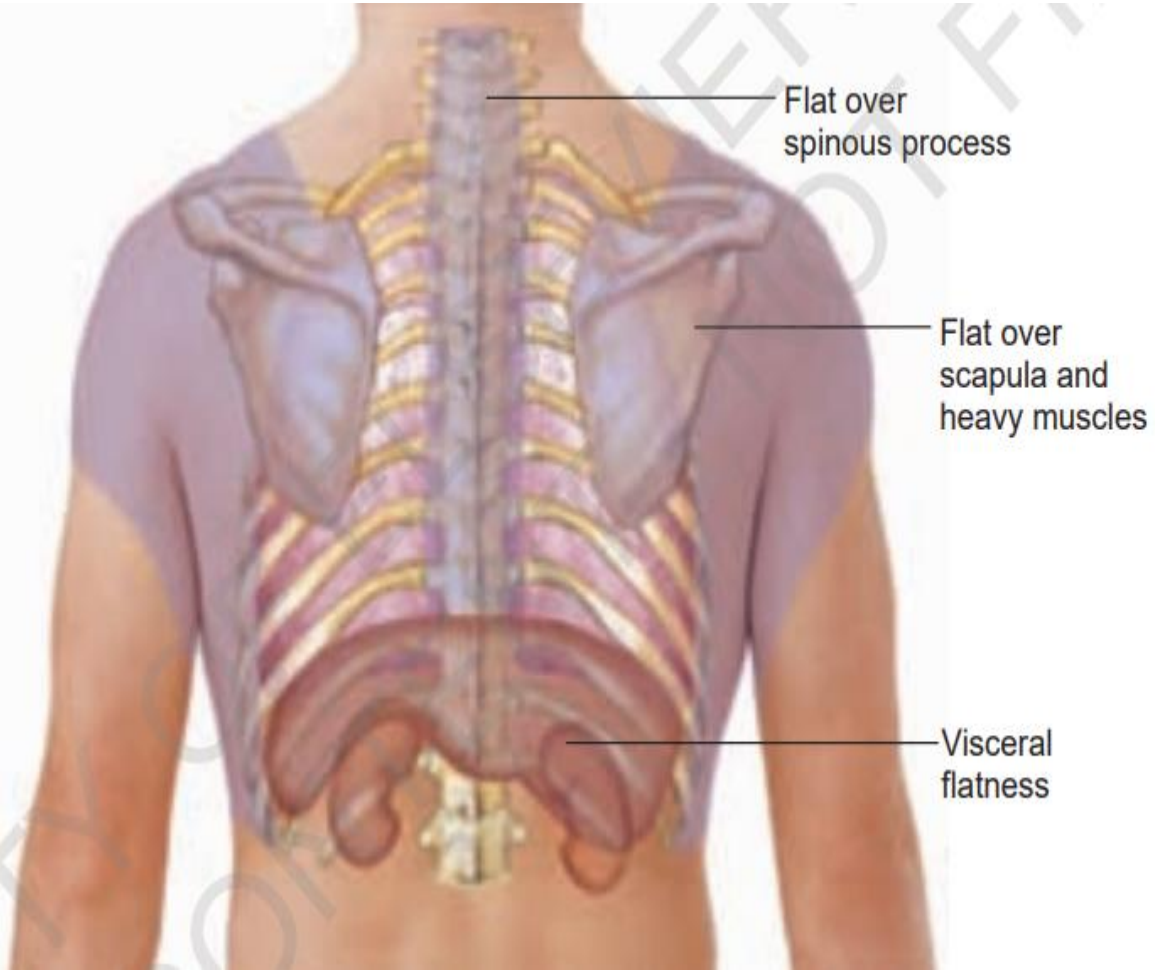
HISTORY AND PHYSICAL EXAM

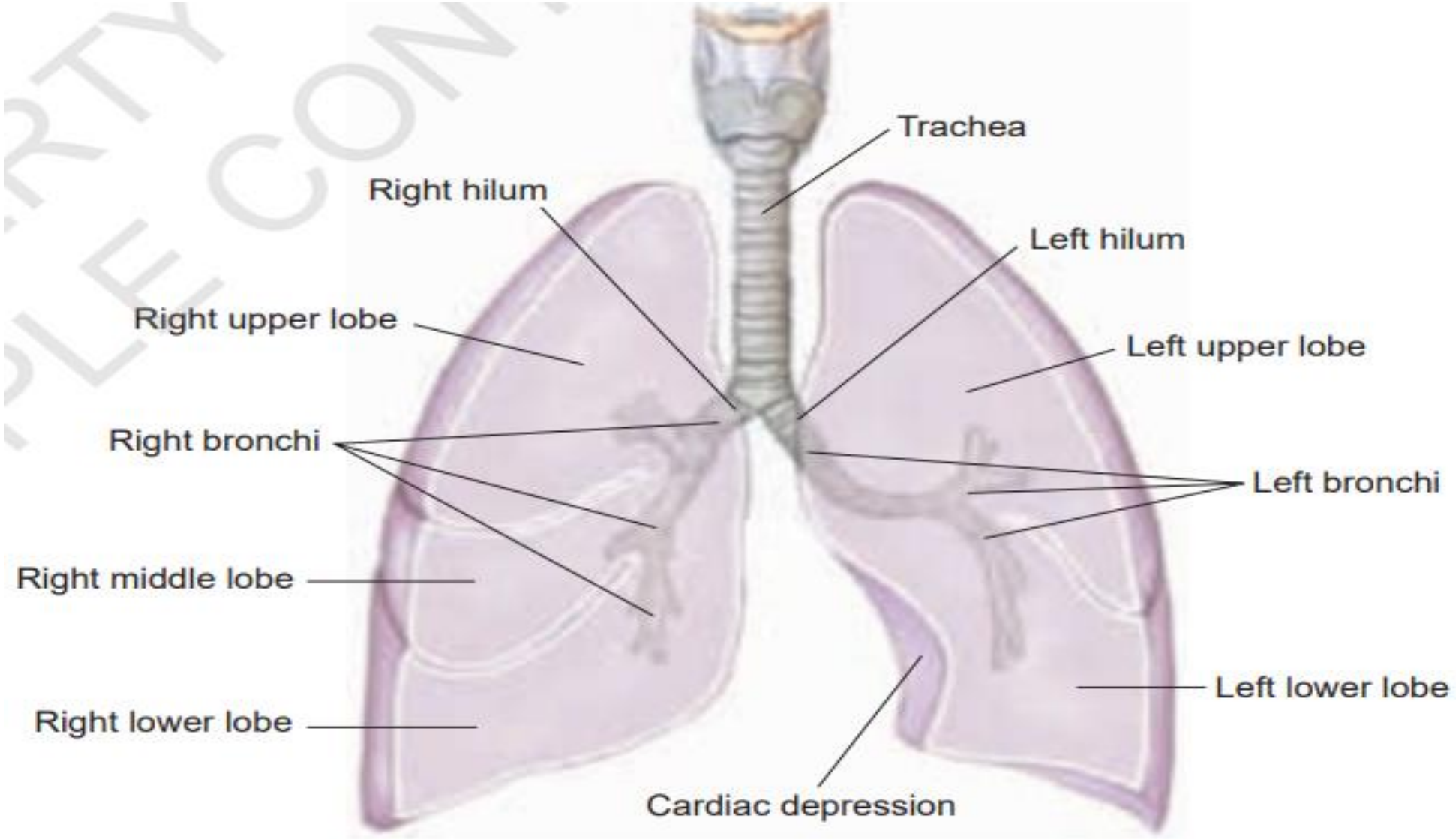
DR.MOHSEN SHAFIEPOUR/PULMONOLOGIST

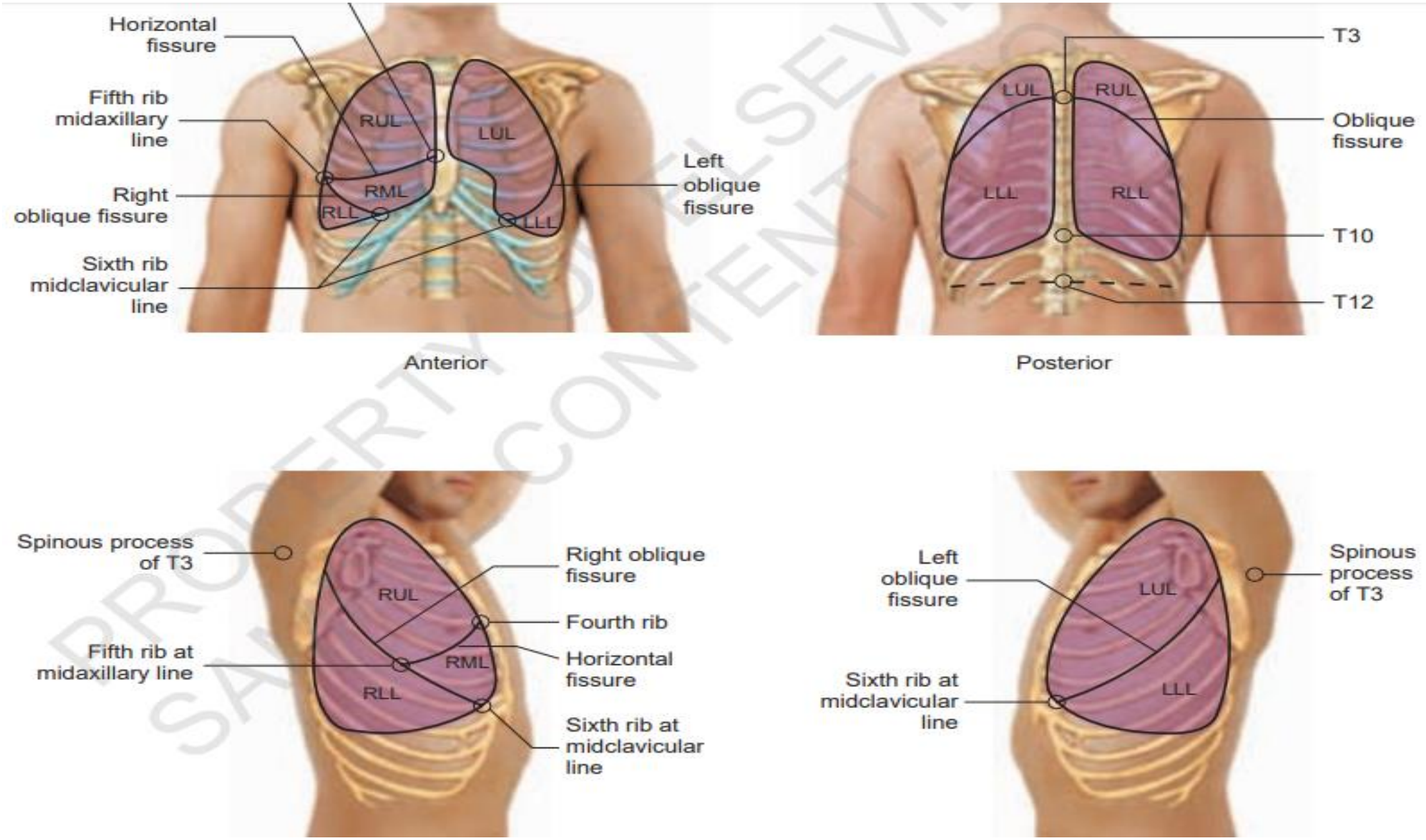

Larynx
Trachea
Clavicle
Acromion process
Manubrium
Sternum
Scapula
Right lung
Left lung
Xiphoid
Ribs
A
Thoracic vertebrae
Clavicle
Acromion process
Scapula
Right lung
Left lung
Ribs
B

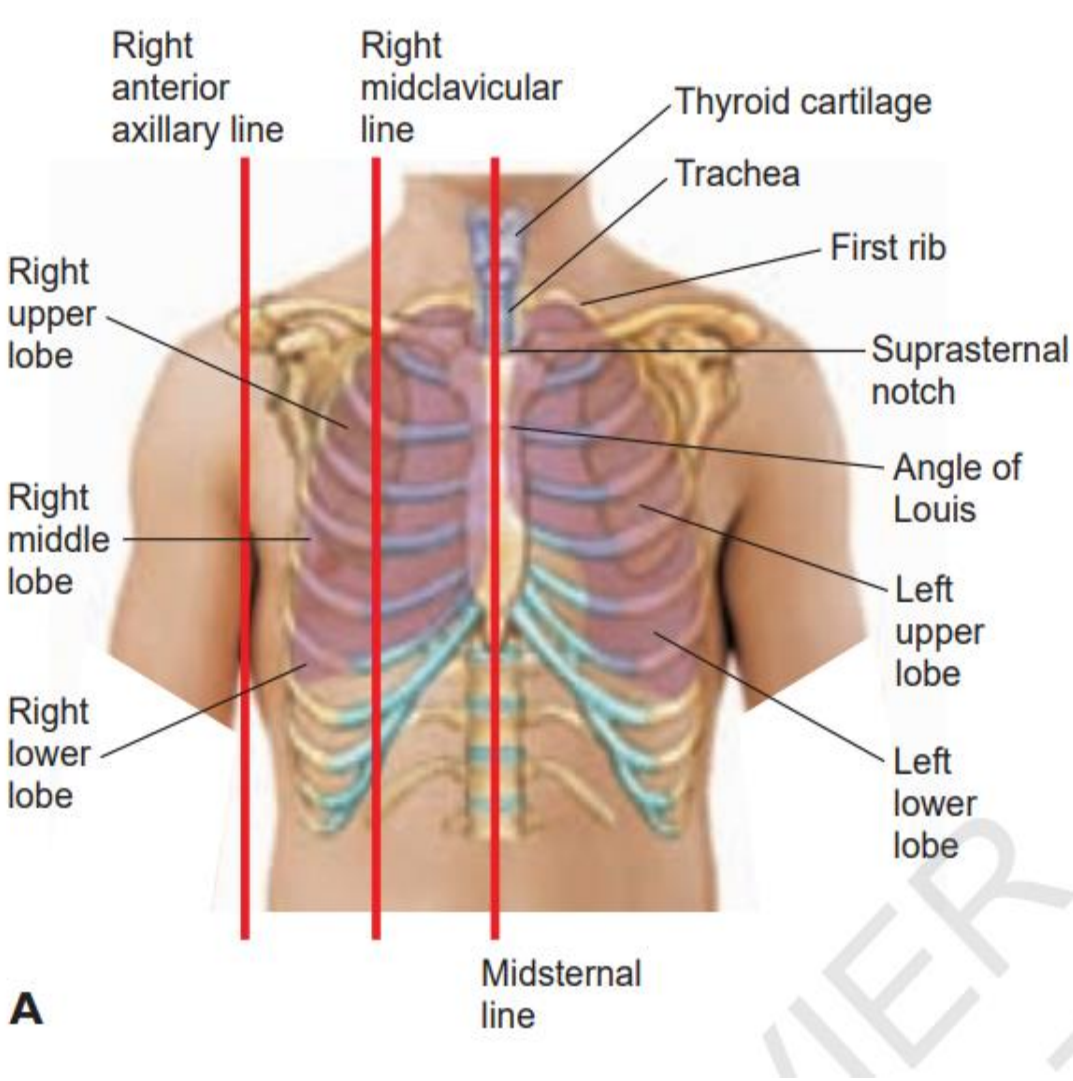

Suprasternal notch
Clavicle
Clavicle
Manubrium
Second rib
Manubriosternal junction (angle of Louis)
Body of sternum
Nipple
Nipple
Xiphoid process
Costal angle

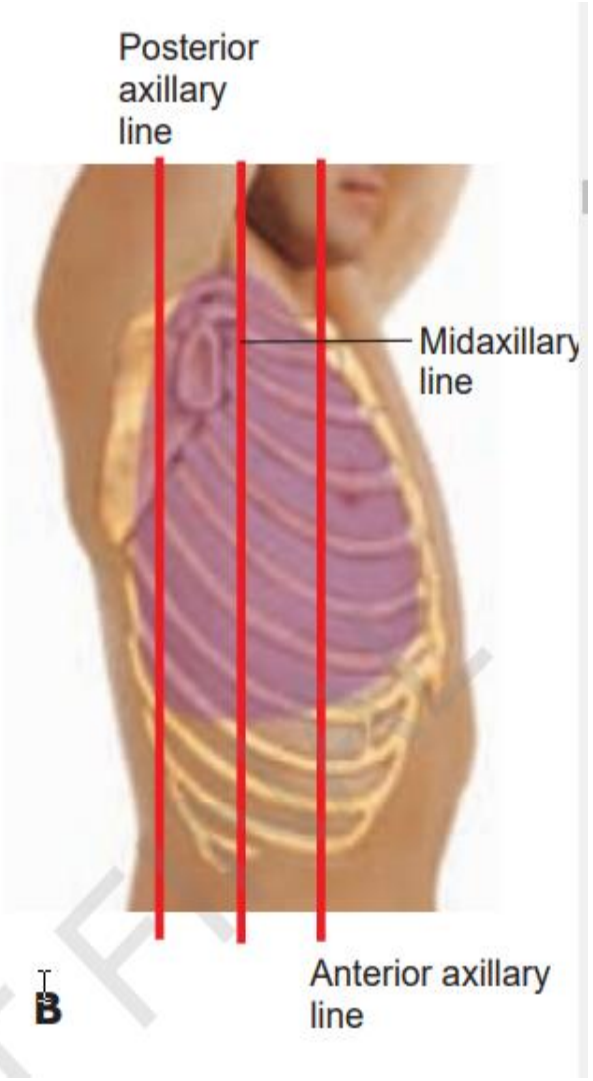

Flat over heavy muscles and bones
Resonance
Cardiac dullness
Liver dullness
Stomach tympany


Flat over spinous process
Flat over scapula and heavy muscles
Visceral flatness

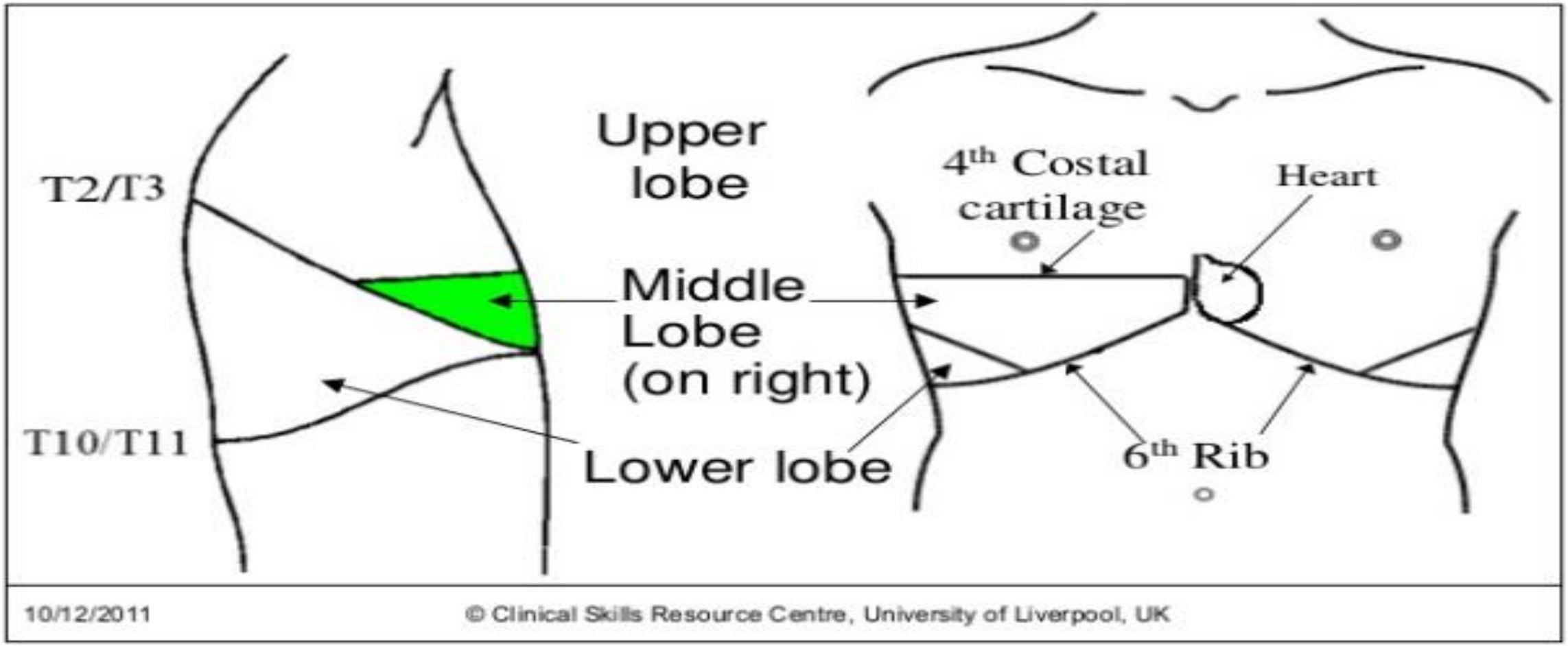

Trachea
Right hilum
Left hilum
Right upper lobe
Left upper lobe
Right bronchi
Left bronchi
Right middle lobe
Left lower lobe
Right lower lobe
Cardiac depression




Right anterior axillary line
Right midclavicular line
Thyroid cartilage
Trachea
First rib
Suprasternal notch
Angle of Louis
Left upper lobe
Left lower lobe
Right upper lobe
Right middle lobe
Right lower lobe
Midsternal line
A

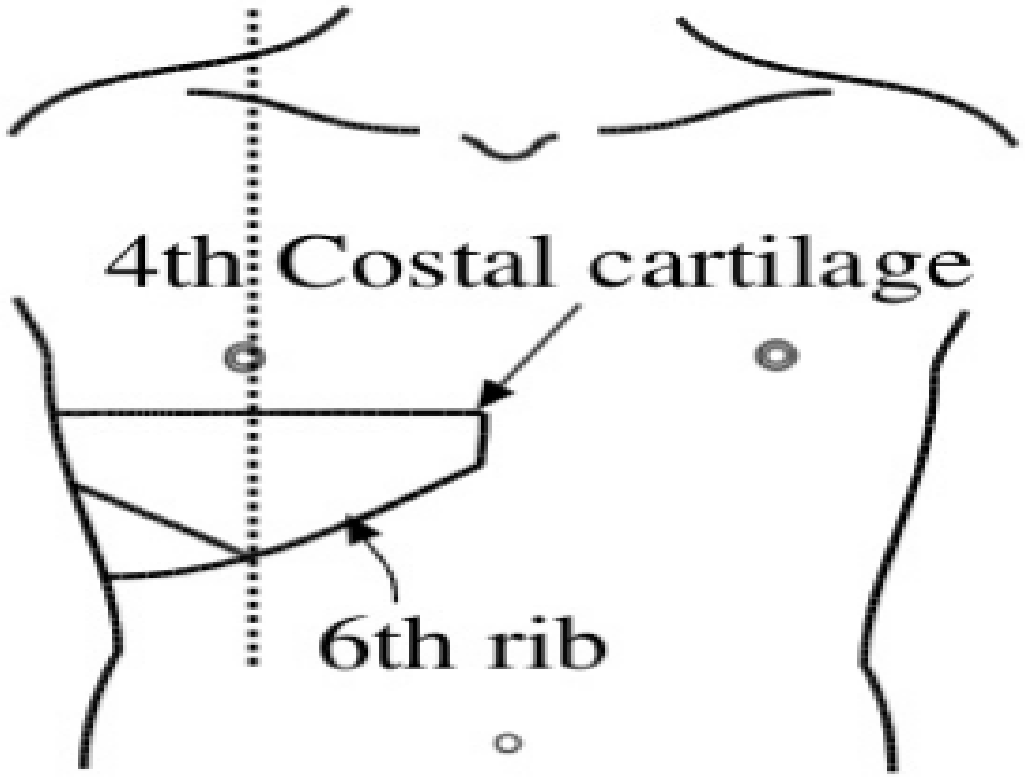

Posterior axillary line
Midaxillary line
Anterior axillary line
B

Surface markings of the Lungs



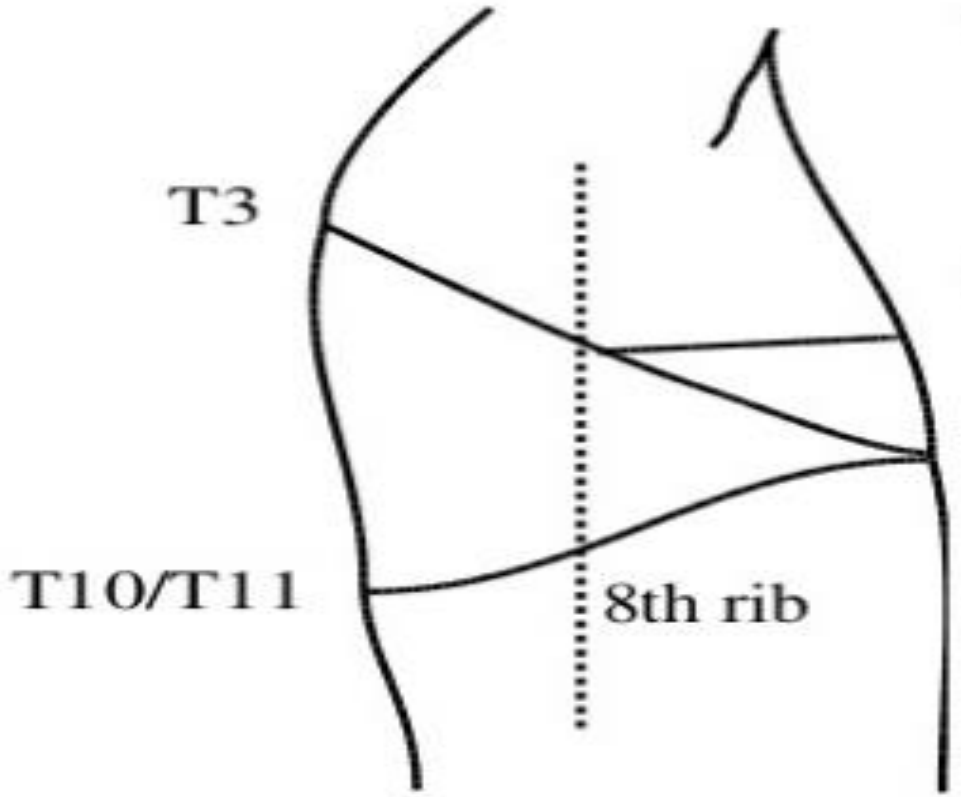
10/12/2011

Anterior



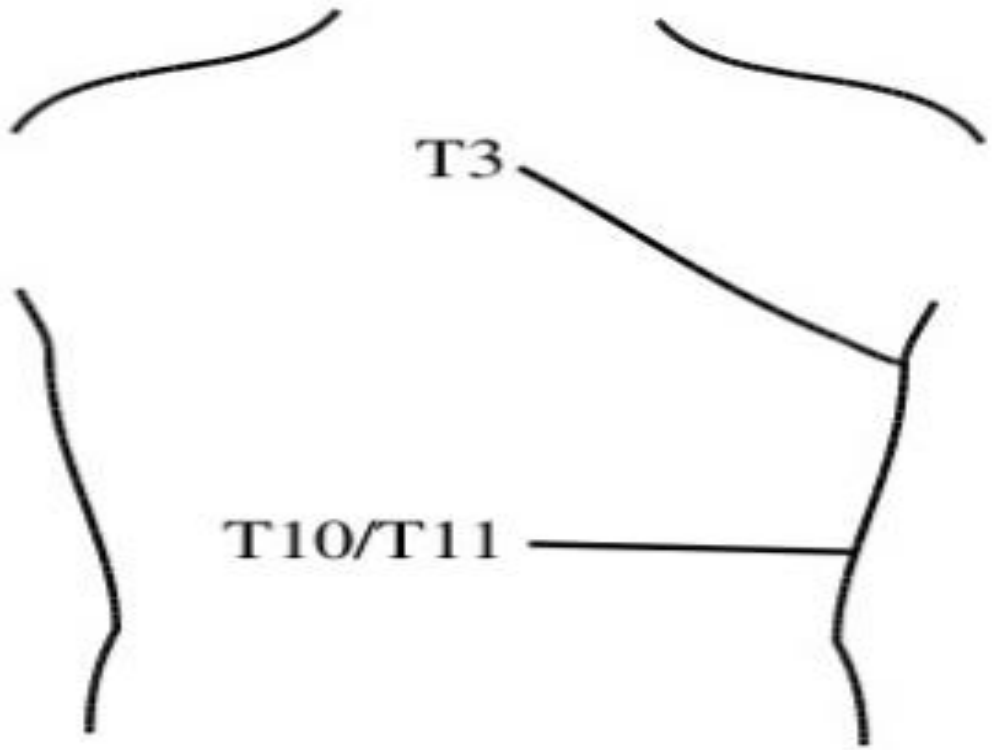
- The lower border of the lung (at rest) extends down to the 6th rib
- The oblique fissure is marked anteriorly by the point at which the midclavicular line crosses the sixth rib
- The horizontal fissure on the right is marked by the position of the 4th costal cartilage

Lateral



- The oblique fissure curves upwards towards the 3rd thoracic vertebrae
- The horizontal fissure extends as far as the oblique fissure in the mid-axillary position
- The lower border of the lung extends to the eighth rib in the mid-axillary line

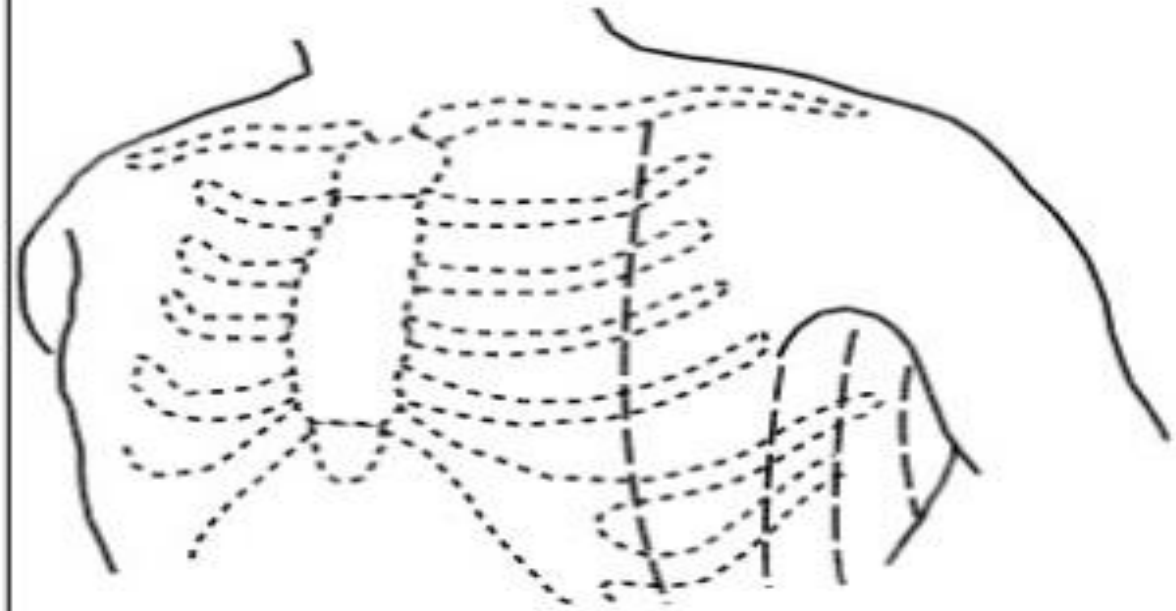
Posterior



- Posteriorly the oblique fissure reaches up to the level of the 3rd thoracic vertebra
- The lower most border of the lung is marked by the 10th or 11th rib

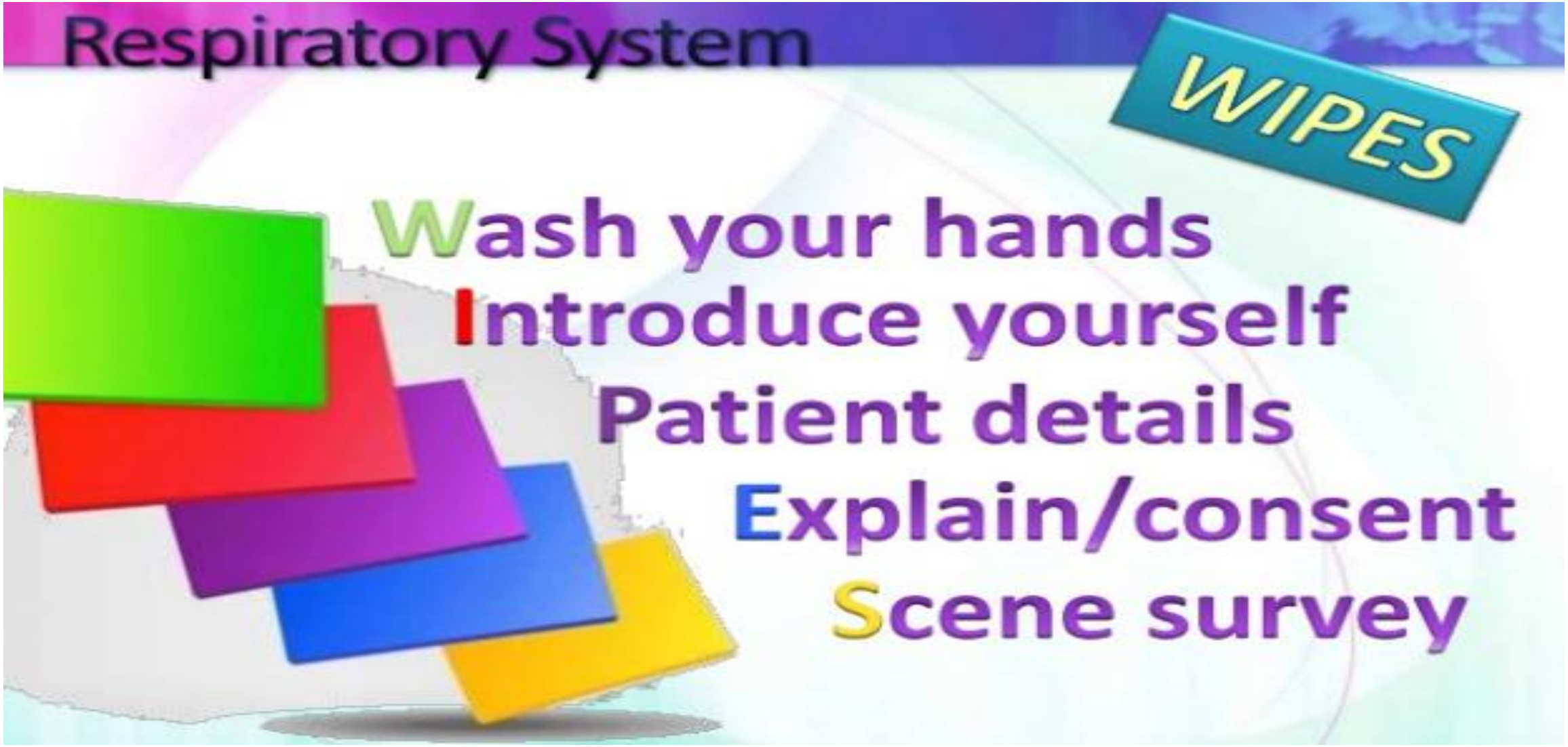
Anatomical landmark test

Match the items opposite to the diagram below drawing lines to the appropriate structures



- Suprasternal notch
- Clavicle
- Sternomanubrial joint (angle of Louis)
- 2nd intercostal space
- Midclavicular line
- Cardiac apex
- Anterior axillary line
- Mid-axillary line
- Posterior axillary line
- Xiphisternum

Respiratory System



History taking

- Location
- Quality
- Quantity or severity
- Timing
- Setting in which it occurs
- Aggravating or relieving factors
- Assoc manifestations; addl relevant features of each symptom

HISTORY OF PRESENT ILLNESS

- Coughing
  - Onset: sudden, gradual; duration
  - Nature of cough: dry, moist, wet, hacking, hoarse, barking, whooping, bubbling, productive, nonproductive
  - Sputum production: duration, frequency, with activity, at certain times of day
  - Sputum characteristics: amount, color (clear, mucoid, purulent, blood-tinged, mostly blood), foul odor
  - Pattern: occasional, regular, paroxysmal; related to time of day, weather, activities (e.g., exercise), talking, deep breaths; change over time
  - Severity: tires patient, disrupts sleep or conversation, causes chest pain
  - Associated symptoms: shortness of breath, chest pain or tightness with breathing, fever, coryza, stuffy nose, noisy respirations, hoarseness, gagging, choking, stress
  - Efforts to treat: prescription or nonprescription drugs, vaporizers; effectiveness
- Shortness of breath (Box 13-2)
  - Onset: sudden or gradual; duration; gagging or choking event before onset
  - Pattern
  - Position most comfortable, number of pillows used
  - Related to extent of exercise, certain activities, time of day, eating
  - Harder to inhale or exhale
  - Severity: extent of activity limitation, fatigue with breathing, anxiety about getting air

Shortness of breath

- Do you have a history of asthma or emphysema (COPD)?
- Have you had clots in your legs?
- Have you been hit in the chest?
- Are you sleepy during the day?

Shortness of breath

- How fast did it happen?
- Do you have chest pain?
- Does the pain change with respiration (pleuritic) ?
- Does your SOB gets better or worse with walking?
- Does your breathing pattern improve when you sit up?

Descriptors of Respiration

Dyspnea, difficult and labored breathing with shortness of breath, is commonly observed with pulmonary or cardiac compromise. A sedentary lifestyle and obesity can cause it in an otherwise well person. In general, dyspnea increases with the severity of the underlying condition. It is important to establish the amount and kind of effort that produces dyspnea:

- Is it present even when the patient is resting?
- How much walking? On a level surface? Upstairs?
- Is it necessary to stop and rest when climbing stairs?
- With what other activities of daily life does dyspnea begin? With what level of physical demand?

Other manifestations of respiratory difficulty include the following:

- *Orthopnea*—shortness of breath that begins or increases when the patient lies down; ask whether the patient needs to sleep on more than one pillow and whether that helps.
- *Paroxysmal nocturnal dyspnea*—a sudden onset of shortness of breath after a period of sleep; sitting upright is helpful.
- *Platypnea*—dyspnea increases in the upright posture.

System

- Most clinicians will examine all elements on the anterior chest wall (inspection, palpation, percussion, auscultation) and then repeat the examination for the posterior and lateral chest.
- This avoids the patient moving back and forth multiple times.

- Examination of the respiratory system is carried out by:

-Inspection

-Palpation

-Percussion

-Auscultation

Inspection of the chest

- Chest wall

(anterior, posterior and lateral)

  - Shape
  - Deformities
  - Scars
  - Rashes
  - Local lesions

- Breathing pattern
  - Depth
  - Regularity
  - Symmetry
  - Accessory muscles of respiration

General Inspection

General Inspection

- General demeanour
- Breathlessness
- Sweating
- Pain or discomfort
- Cachexia
- Colour
  - Cyanosis
  - Pallor

Other signs to note

- Noises
  - Stridor (inspiratory)
  - Wheeze (expiratory)
- Hoarseness whilst talking
- Can they talk in full sentences?

Face and Neck

- Eyes
  - Conjunctivae (pallor)
- Mouth
  - Cyanosis of tongue (central)
  - Signs of dehydration
- Examination of upper respiratory tract
- Neck
  - Tracheal position (see next slide)
  - Regional lymph nodes

Hands and Vital Signs

- Nails (Clubbing, koilonychia and peripheral cyanosis)
- Tar staining of fingers
- Tremors
- Flap (due to $C0_2$ retention)
- Check patient's vital signs (pulse, respiratory rate, blood pressure & temperature)

Examination of the chest

Inspection

- **Shape of the chest**

  The normal chest is bilaterally symmetrical and elliptical in cross section

  the transverse diameter > anteroposterior diameter

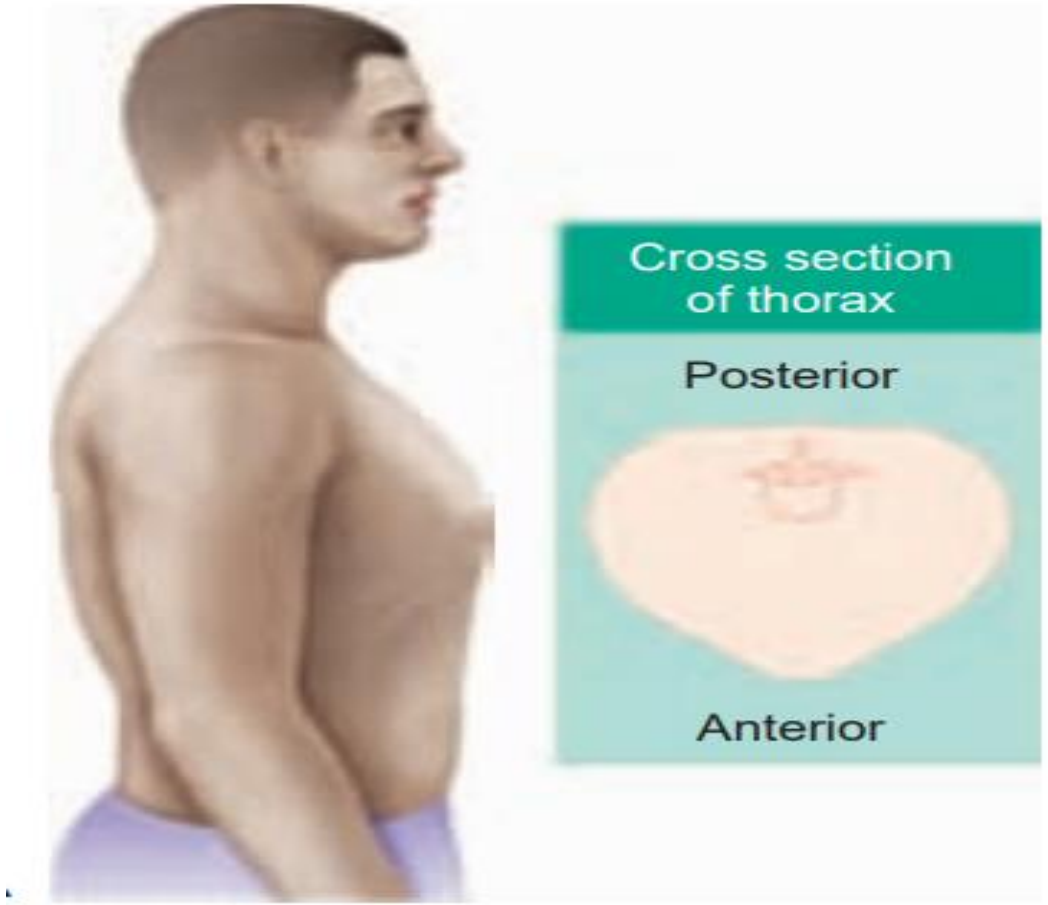
Comman abnormalities of shape

kyphosis-forward bending of vertebral column

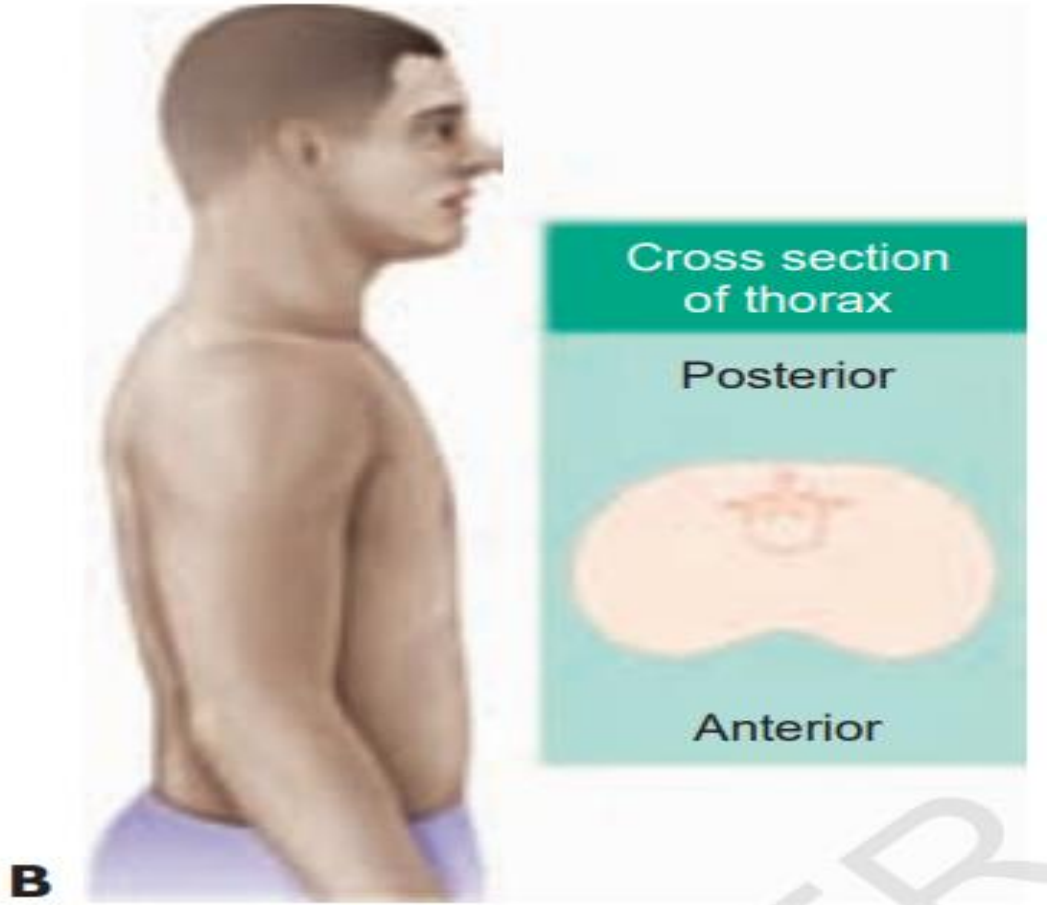
scoliosis- lateral bending of vertebral column

barrel shaped chest- increase in anteroposterior diameter

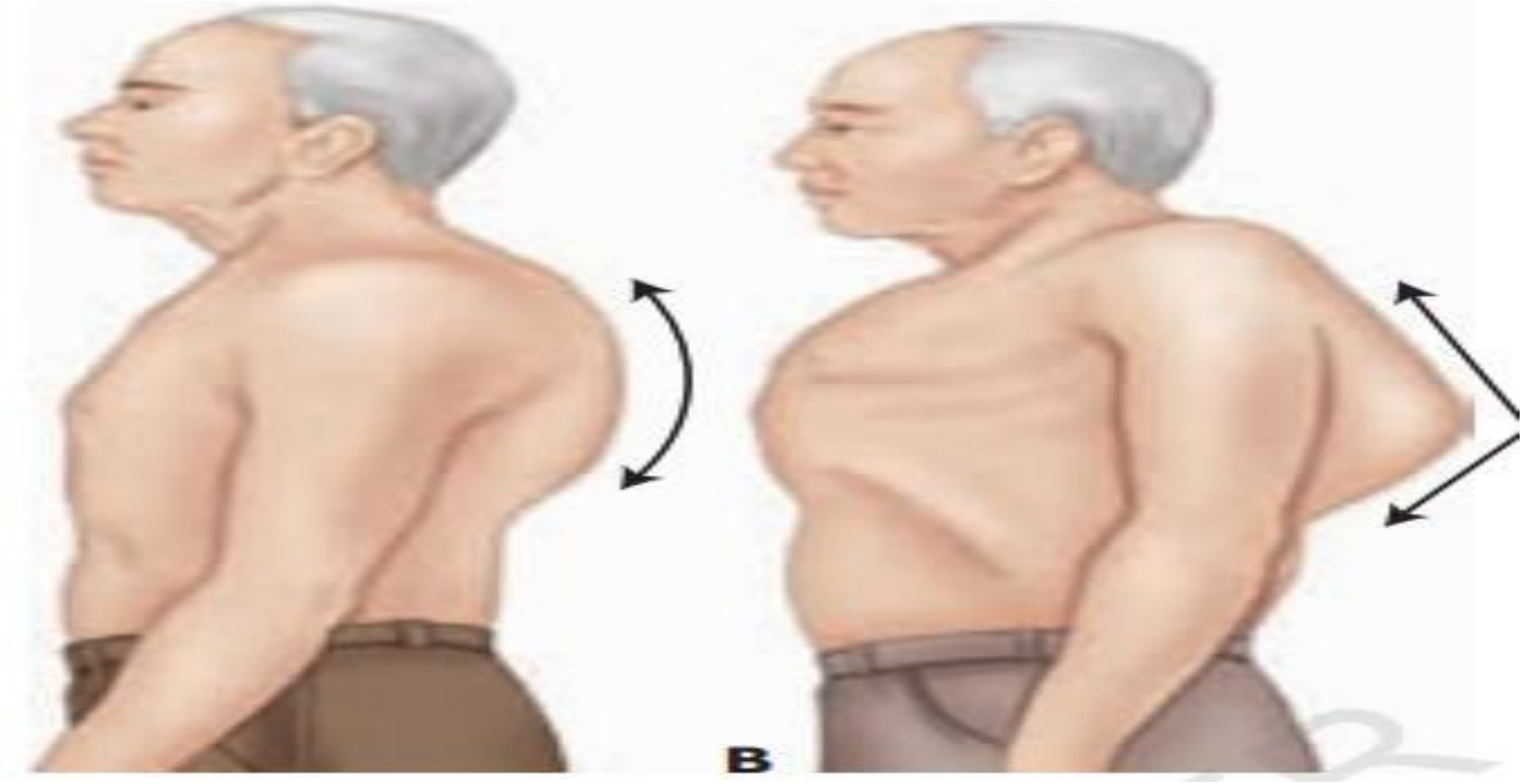
flattening



Pectus carinatum(pigeon chest)



pectus excavatum(funnel chest)


B

Inspection

- Rate & Rhythm of respiration

  Rate of respiration in health (adult)

  12-14 breaths/min

- Measurement of chest expansion

  chest expansion can be measured with a tape measure around the chest just below the nipples

  in a healthy adult it is about 3-5 cm

- Symmetry of chest expansion

  chest expansion of a healthy adult should be equal on both sides

- Movements of the chest wall

  presence of intercostal recessions or the use of accessory muscles

Normal

Regular and comfortable at a rate of 12-20 per minute

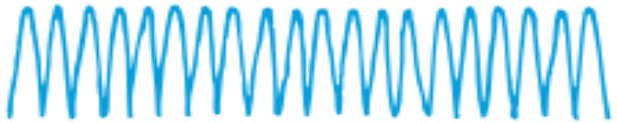
Bradypnea

Slower than 12 breaths per minute

Tachypnea

Faster than 20 breaths per minute

Hyperventilation (hyperpnea)



Faster than 20 breaths per minute, deep breathing

Sighing

Frequently interspersed deeper breath

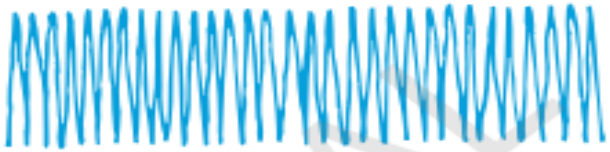
Air trapping

Increasing difficulty in getting breath out

Cheyne-Stokes

Varying periods of increasing depth interspersed with apnea

Kussmaul



Rapid, deep, labored

Biot

Irregularly interspersed periods of apnea in a disorganized sequence of breaths

Ataxic

Significant disorganization with irregular and varying depths of respiration

Palpation

Before making a systemic examination palpate any part of the chest where the patient complains of pain or where there is a swelling

- **Position of the Apex beat and Trachea**

  In normal subjects the trachea is in the midline and can be palpated in the suprasternal notch

  the apex beat (the lowest and outermost point of definite cardiac pulsations) can be usually palpated in the 5th intercostal space within the midclavicular line

  Displacement of the apex beat and trachea indicates that the position of the mediastinum has been altered

  This may be due to diseases of the heart, lungs or pleura

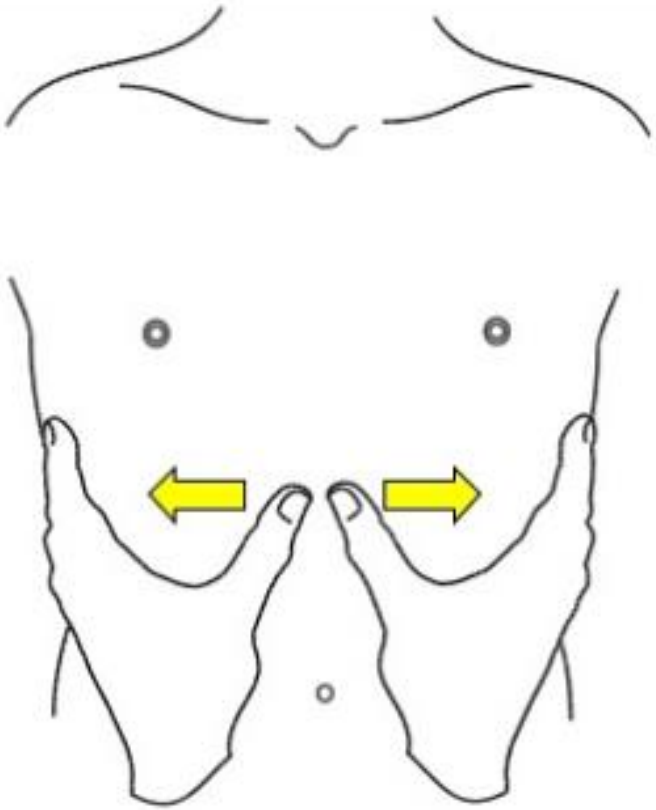
Tracheal Position

- To locate the patient's trachea palpate with the fingertips between the sternocleidomastoid muscles at the suprasternal notch.
- Compare the tracheal position to an imaginary vertical line through the suprasternal notch (midline).
- Any deviation from the midline is considered abnormal.

Palpation

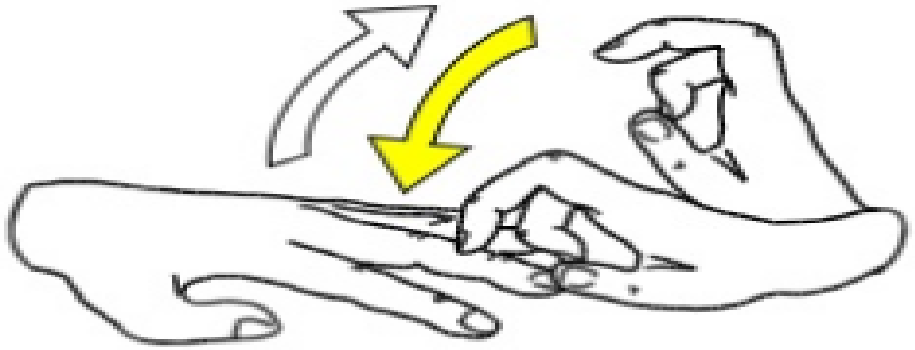
- Any local abnormality seen on inspection
- Apex beat may be displaced (see CVS examination study guide)
- Chest wall
  - Tenderness
  - Expansion (see next slide)

Chest expansion



- Expansion can be assessed by placing thumbs together and laying outstretched hands across anterior chest wall.
- On inspiration the thumbs will move apart.
- Repeat on posterior chest wall.

Percussion



See "Basics of examination" study guide for details of percussion technique

- **Ensure you cover all lung lobes (know your anatomy!)**
- **Intercostal spaces (lay finger along intercostal space).**
- **When percussing clavicles, tap finger directly on to bone.**
- **Compare sides by alternating similar areas on right and left.**
- **Percuss anterior, lateral and posterior chest.**


A
B

TABLE 13-1 Percussion Tones Heard Over the Chest

Type of Tone	Intensity	Pitch	Duration	Quality
Resonant	Loud	Low	Long	Hollow
Flat	Soft	High	Short	Very dull
Dull	Medium	Medium to high	Medium	Dull thud
Tympanic	Loud	High	Medium	Drumlike
Hyperresonant*	Very loud	Very low	Longer	Booming

Percussion notes

- Clavicles (overlying lung apices) = resonant
- Normal lung tissue = resonant
- Heart = dull
- Liver = dull
- Abnormal solid areas = dull
- Fluid (e.g. Pleural effusion) = stony dull
- Pneumothorax = hyper-resonant

Pulmonary Auscultation

Auscultation is perhaps the most important and effective clinical technique you will ever learn for evaluating a patient's respiratory function. Before you begin, there are certain things that you should keep in mind:

Pulmonary Auscultation

a) It is important that you try to create a **quiet environment** as much as possible. This may be difficult in a busy emergency room or in a room with other patients and their visitors. Eliminate noise by closing the door and turning off any radios or televisions in the room.

Pulmonary Auscultation

b) The patient should be in the **proper position** for auscultation, i.e. sitting up in bed or on the cot, ensuring that his or her chest is not leaning against anything. If this is not possible, ask for assistance or perform only a partial assessment of the patient's breathing.

Pulmonary Auscultation

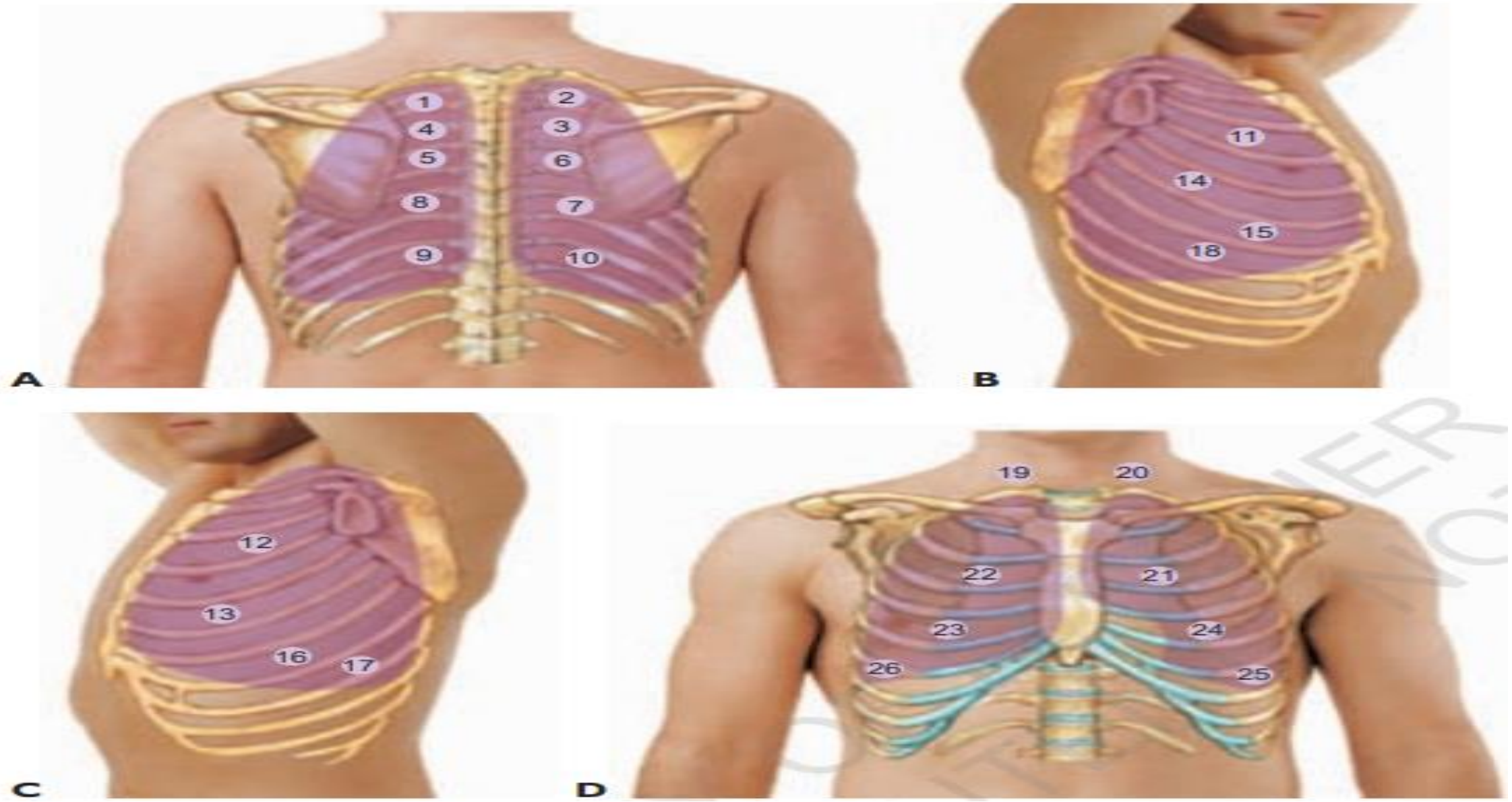
As you are auscultating your patient, please keep in mind these 2 questions:

1) Are the breath sounds increased, normal, or decreased?

2) Are there any abnormal or adventitious (added from another source) breath sounds?

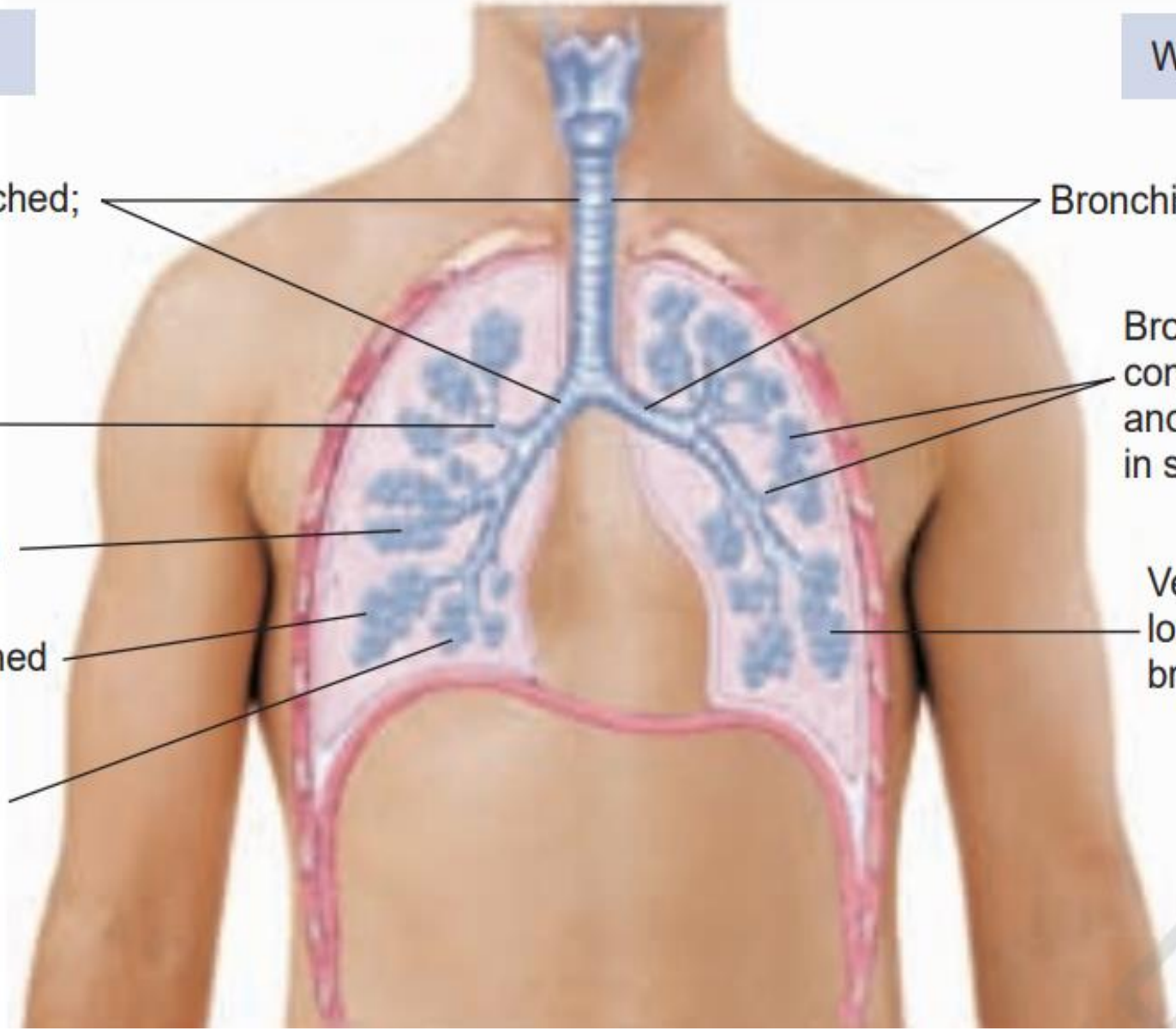
Auscultation

- Patient breathes with open mouth
- Use the bell (if patient is hairy) or diaphragm of the stethoscope
- Compare right and left
- Auscultate a large number of sites to ensure all lobes examined
- Auscultate anterior, lateral and posterior chest walls
- Listen for
  - Breath sounds (vesicular or bronchial)
  - Added sounds e.g. wheezes, crackles or pleural rub


1
2
4
3
5
6
8
7
9
10
A
11
14
15
18
B
12
13
16
17
C
19
20
22
21
23
24
26
25
D

Characteristics of Normal Breath Sounds

Sound	Characteristics	Findings
Vesicular	Heard over most of lung fields; low pitch; soft and short expirations (see Figs. 13-22 and 13-23); more prominent in a thin person or a child, diminished in the overweight or very muscular patient	
Bronchovesicular	Heard over main bronchus area and over upper right posterior lung field; medium pitch; expiration equals inspiration	
Bronchial/tracheal (tubular)	Heard only over trachea; high pitch; loud and long expirations, sometimes a bit longer than inspiration	


ILL
WELL
Rhonchi: coarse low-pitched; may clear with cough
Wheeze: whistling, high-pitched bronchus
Bronchial: coarse, loud; heard with consolidation
Rub: scratchy, high-pitched
Crackles: fine crackling, high-pitched
Bronchial: coarse, loud
Bronchovesicular: combination bronchial and vesicular, normal in some areas
Vesicular: low-pitched, breezy

Fine crackles: high-pitched, discrete, discontinuous crackling sounds heard during the end of inspiration; not cleared by a cough

Medium crackles: lower, more moist sound heard during the midstage of inspiration; not cleared by a cough

Coarse crackles: loud, bubbly noise heard during inspiration; not cleared by a cough

Rhonchi (sonorous wheeze): loud, low, coarse sounds like a snore most often heard continuously during inspiration or expiration; coughing may clear sound (usually means mucus accumulation in trachea or large bronchi)

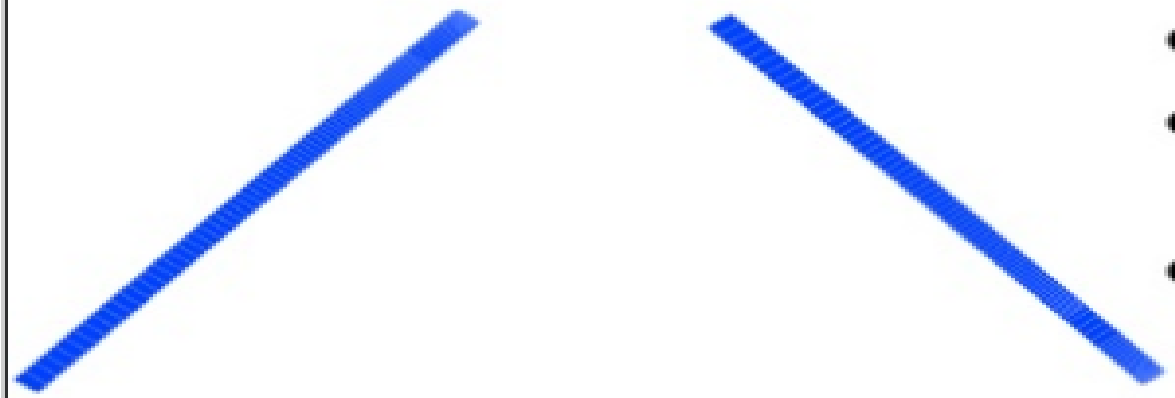
Wheeze (sibilant wheeze): musical noise sounding like a squeak; most often heard continuously during inspiration or expiration; usually louder during expiration

Pleural friction rub: dry, rubbing, or grating sound, usually caused by inflammation of pleural surfaces; heard during inspiration or expiration; loudest over lower lateral anterior surface

Vesicular breath sounds

- Normal finding over lung fields.
- Quiet, low pitched, rustling.
- No gap between the phases of inspiration and expiration.
- Expiratory phase shorter than inspiratory phase.

Bronchial breath sounds



- Abnormal finding if auscultated over lung fields.
- Usually louder.
- Transmitted through airless tissue.
- Similar to sound heard over trachea.
- Gap between inspiration and expiration.
- Expiration phase prolonged.

Added sounds

- Normal auscultation should reveal vesicular breath sounds and no added sounds.
- Possible added sounds are:
  - Wheeze
  - Stridor
  - Crackles – fine or coarse
  - Pleural rub

Wheezes

- Prolonged musical sounds
- Usually in expiration
- Localised narrowing within the bronchial tree
- Usually arise from multiple sites during expiratory phase of respiration
- A single fixed wheeze (in position and time) suggests a single fixed narrowing (e.g. tumour)

Stridor

- A sign of large airway narrowing / obstruction
- A harsh sound
- Usually high pitched
- Occurs in both inspiration and expiration, but is usually more marked in the former

Coarse crackles

- Fluid or secretions in the large bronchi
- Bubbling noise
- Can usually be cleared or altered by coughing

Fine crackles

- Inspiratory, high pitched, explosive
- Involve forceful popping open of closed small airways (can be mimicked by rubbing hair between finger and thumb over ear)
- Early inspiratory
  - Chronic bronchitis
  - Bronchiectasis
- Late inspiratory
  - Left ventricular failure
  - Fibrosis
  - Pneumonia

Pleural rub

- Inflamed surfaces rubbing together
- Creaking noise

  (can be reproduced by rubbing on the dorsum of a cupped hand placed over the ear)
- Usually heard in both inspiration and expiration

Tactile (vocal) fremitus

- On identifying an abnormality on auscultation or percussion
- Place hands over abnormal and equivalent area on the opposite side (or a known normal area if comparable area also abnormal)
- Ask the person to say “99”
- Vibration increased over solid tissue, reduced over air and fluid

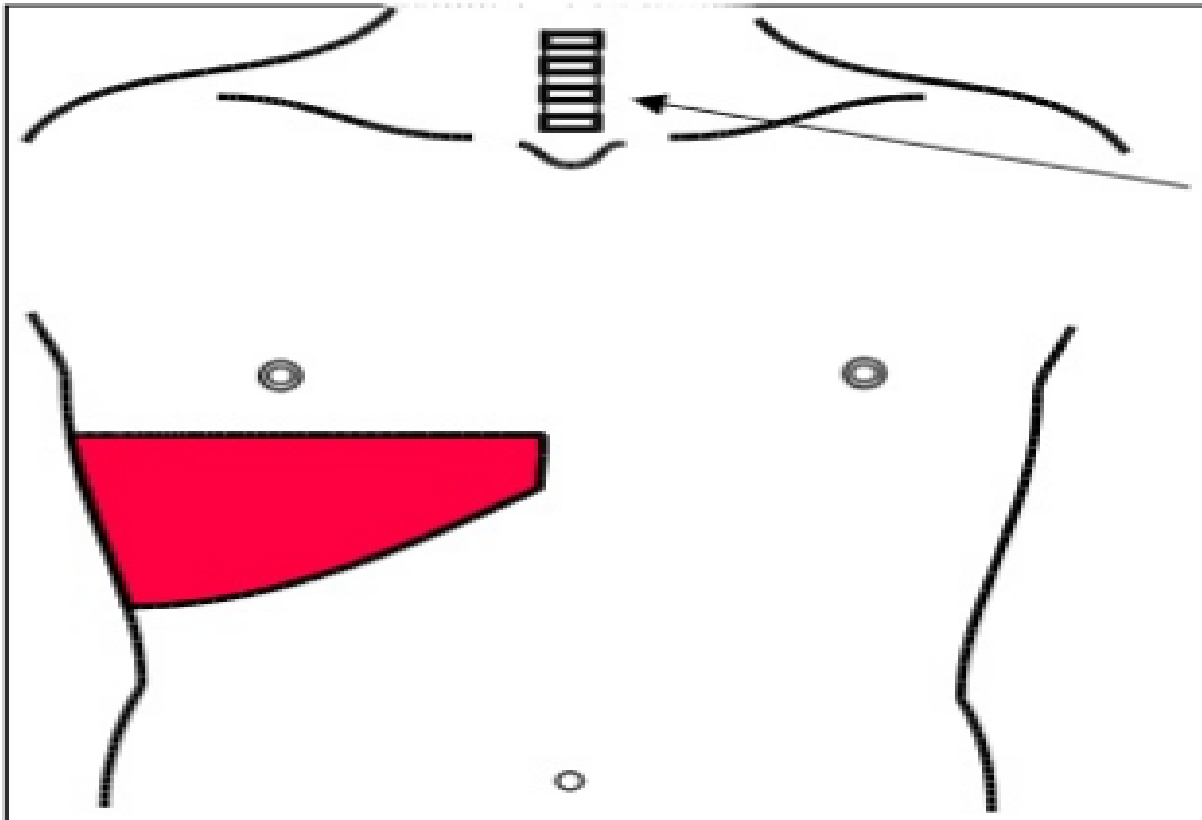
FIGURE 13-15
Two methods for evaluating tactile fremitus. **A,** With palmar surface of both hands. **B,** With ulnar aspect.

Vocal resonance

- On identifying an abnormality on auscultation or percussion
- Listen with stethoscope over the affected area and ask the person to say “99”
- Repeat over same area on the opposite side (or a known normal area if comparable area also abnormal)
- Increased over solid tissue, reduced over air and fluid

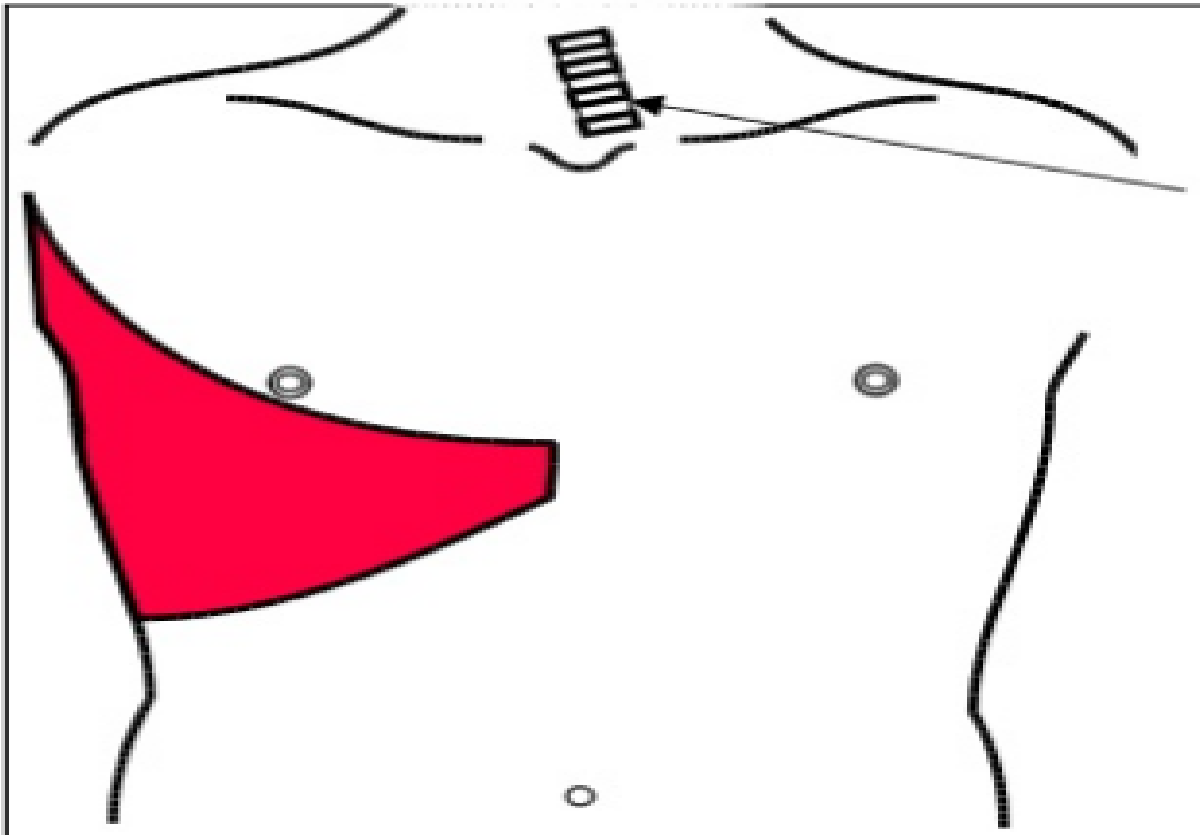
Possible pathology

Consolidation (solid)



- May be reduced movement on affected side
- Trachea central
- Findings over affected area:
  - Percussion note - dull
  - Auscultation - bronchial breathing
- Vocal resonance over area - increased
- Tactile fremitus over area - increased

Pleural effusion (fluid)

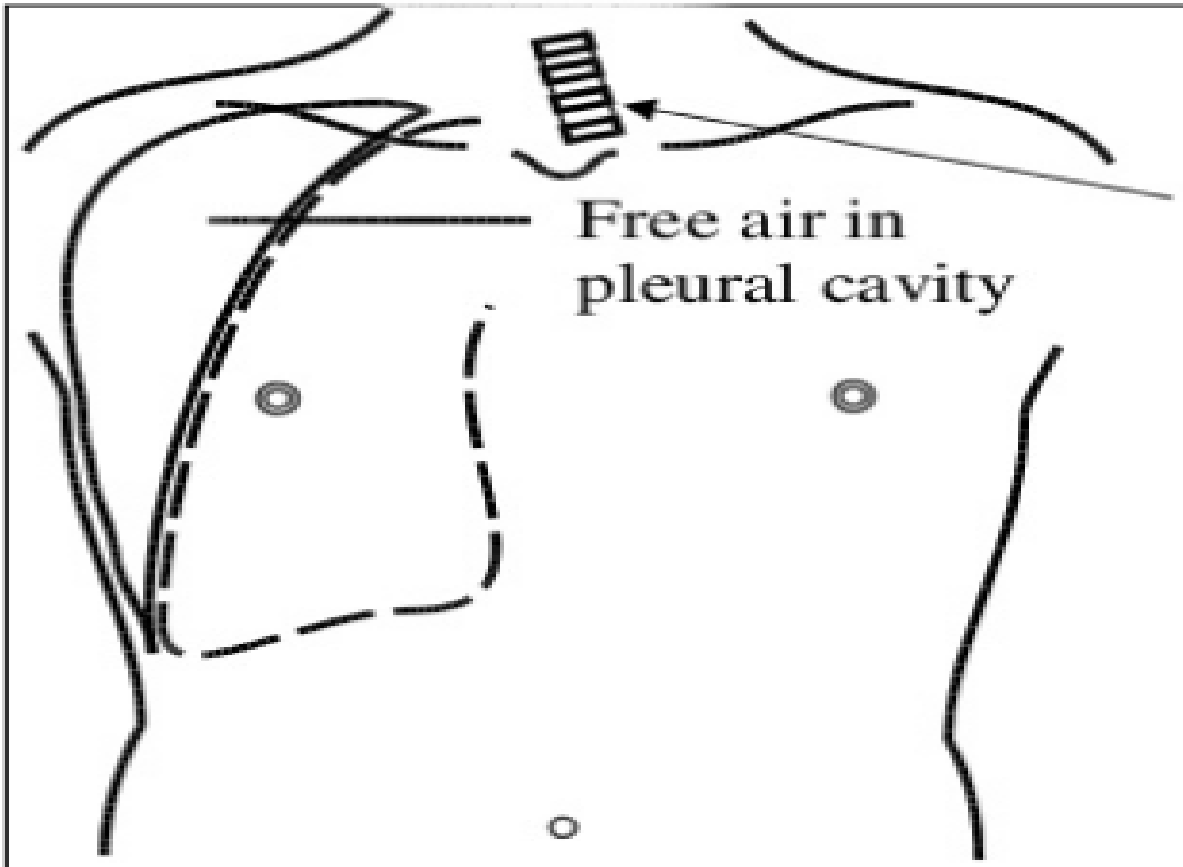


- Chest movement may be reduced on affected side
- Trachea deviated away from affected side (if large)

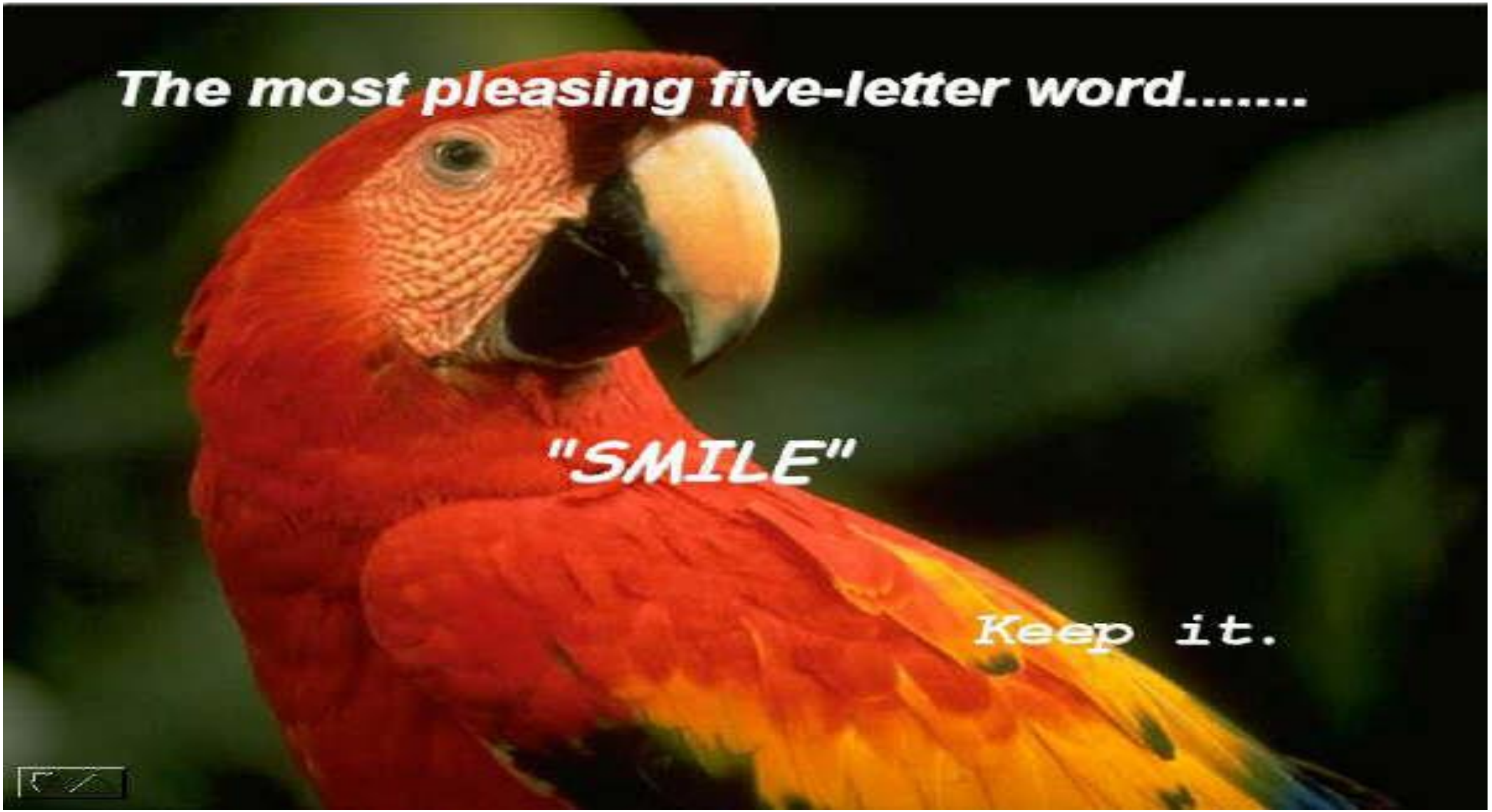
Findings over affected area:

- Percussion note - dull
- Auscultation - reduced breath sounds
- Vocal resonance - reduced
- Tactile fremitus - reduced

Pneumothorax (air)



- Chest movement may be reduced on affected side
- Trachea may be deviated
- Findings over affected area:
- Percussion note - hyper-resonant
- Auscultation - reduced breath sounds
- Vocal resonance - reduced
- Tactile fremitus - reduced


The most pleasing five-letter word.....
"SMILE"
Keep it.

Thanks for Your Attention