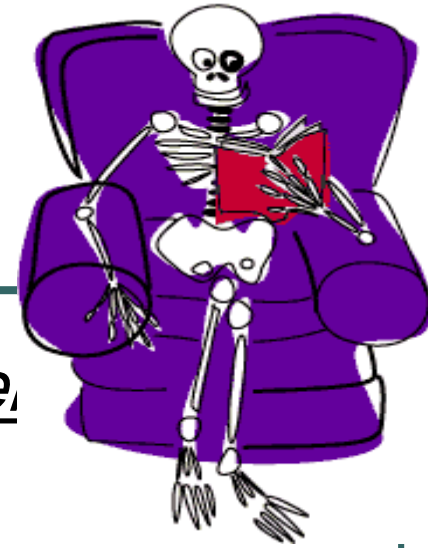


RESPIRATORY SYSTEM
examination

Premed I

Sept 2014

Learning objectives

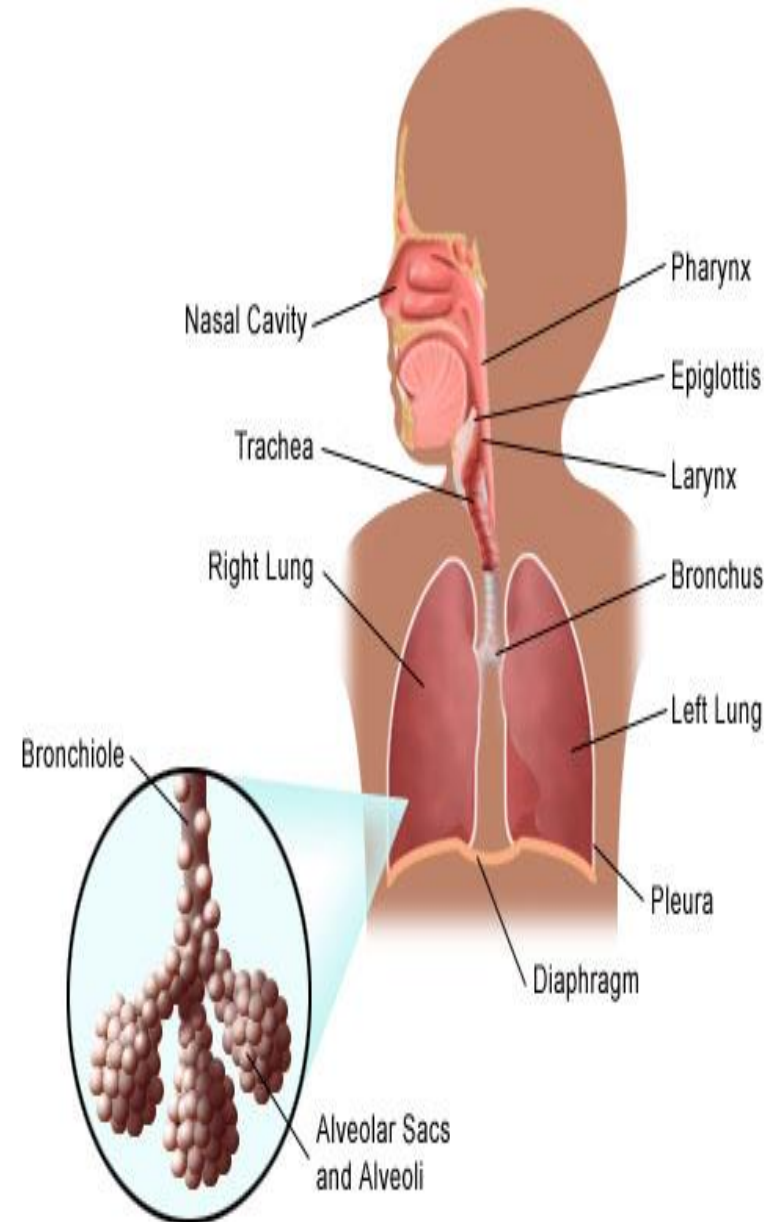


After completion of this session the student should be able to:

- Revise knowledge of anatomy and physiology
- Obtain health history about respiratory system
- Demonstrate physical examination
- Differentiate between normal and abnormal findings

Outlines

- anatomy and physiology of respiratory system
- Assessment of respiratory system]
- 1 Position/Lighting/Draping
- 2 Inspection
 - 2.1 Chest wall deformities
 - 2.2 Signs of respiratory distress
- 3 Palpation
- 4 Percussion
- 5 Auscultation
 - 5.1 Vocal fremitus (not usually done)

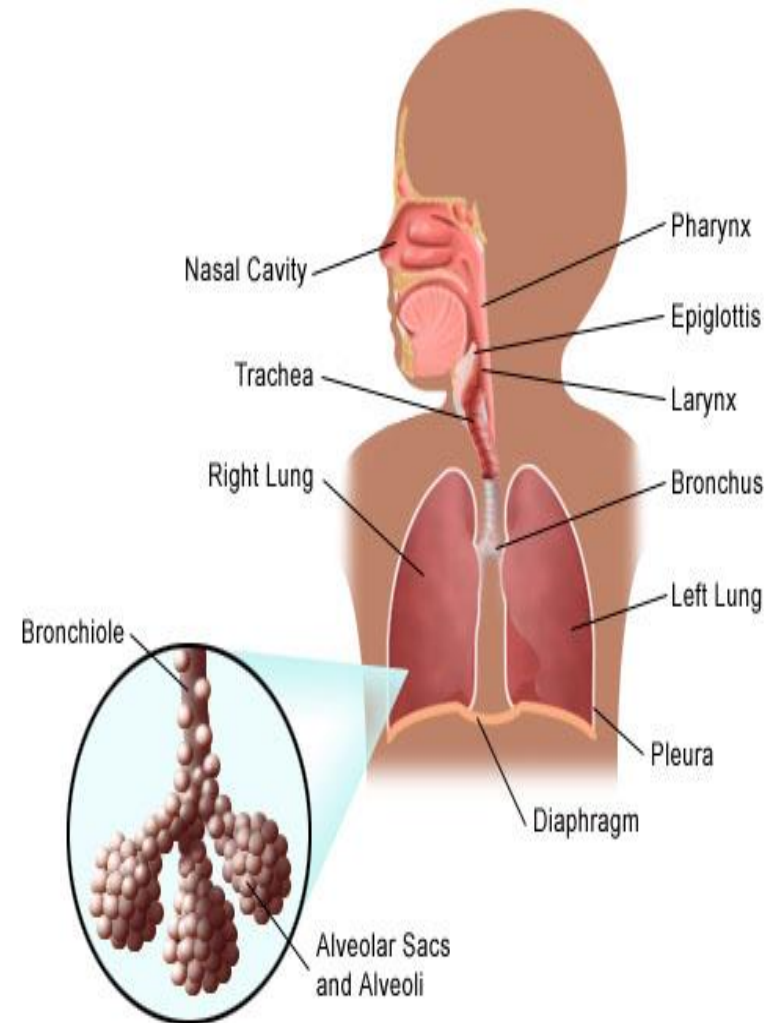


Anatomy and physiology

- The respiratory tract extends from the nose to the alveoli and includes not only the air-conducting passages also but the blood supply
- The primary purpose of the respiratory system is gas exchange, which involves the transfer of oxygen and carbon dioxide between the atmosphere and the blood.
- The respiratory system is divided into two parts: the upper respiratory tract and the
- lower respiratory tract

The upper respiratory tract includes

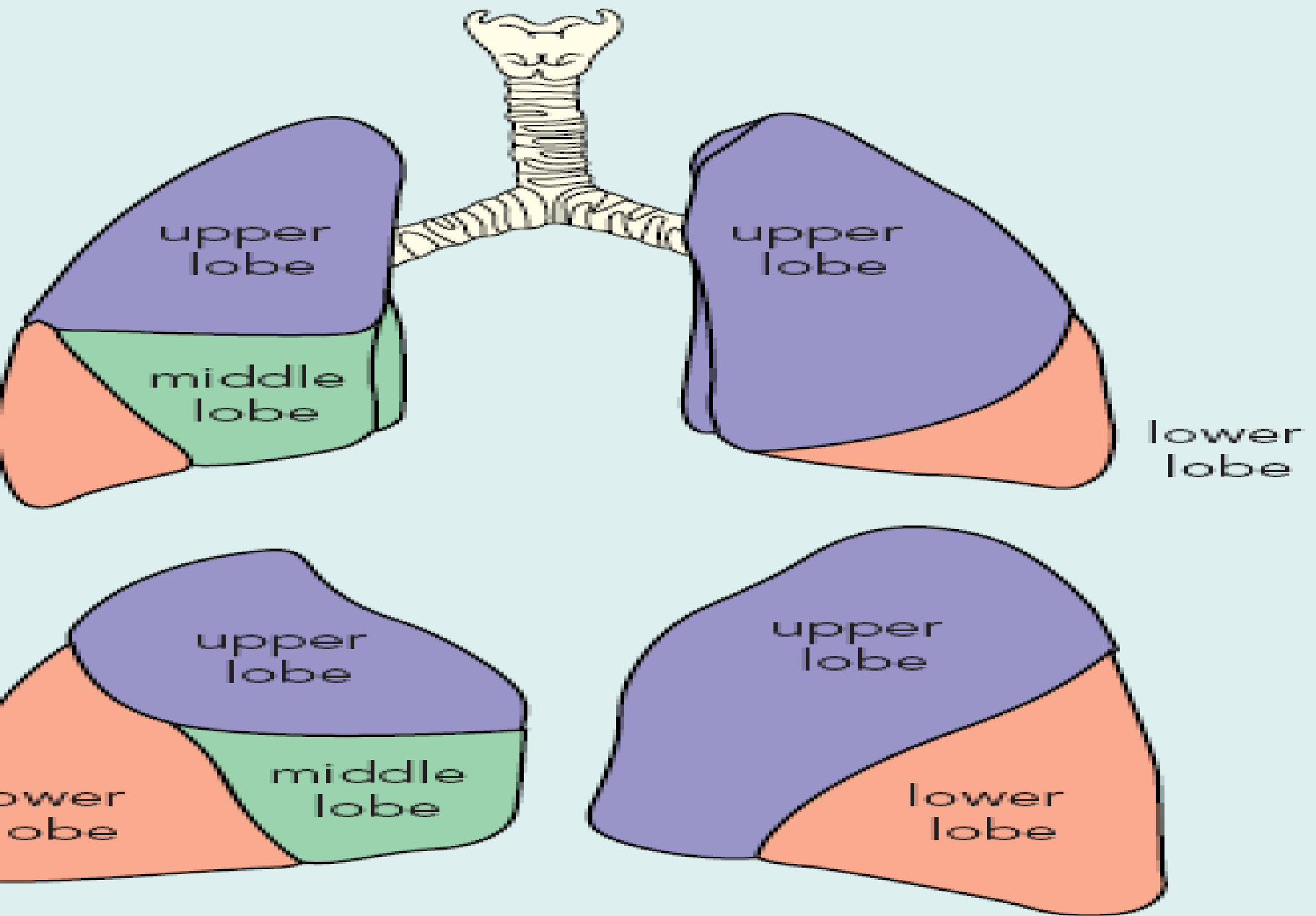
- The nose
- pharynx
- adenoids
- tonsils
- epiglottis
- larynx,
- and trachea.

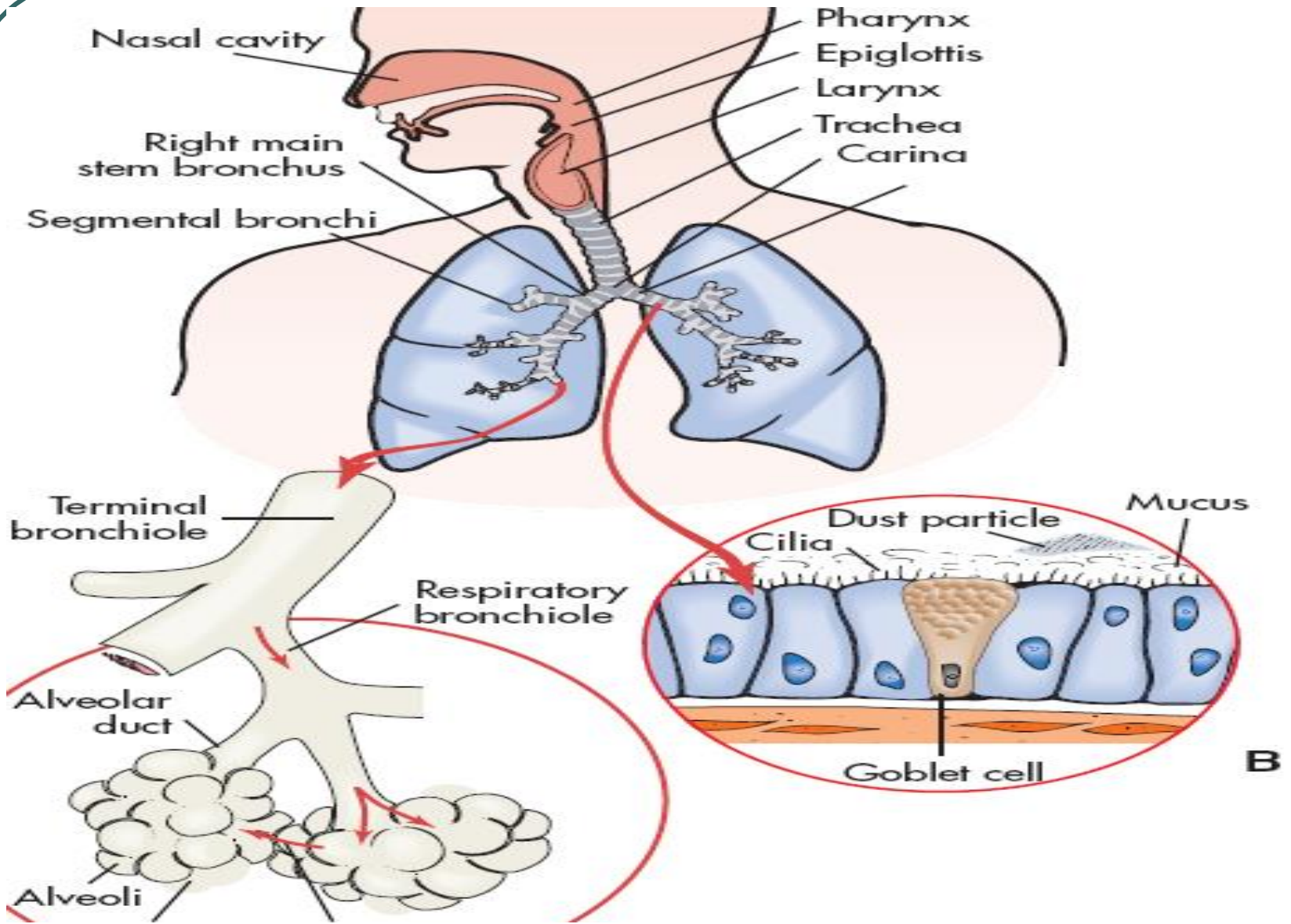


The lower respiratory tract consists of

- the bronchi,
- Bronchioles
- alveolar ducts
- and alveoli
- With the exception of the right and left main-stem bronchi, all lower airway structures are contained within the lungs.

-
- The right lung is divided into three lobes (upper, middle, and lower)
 - the left lung into two lobes (upper and lower)
 - The structures of the chest wall
 - (ribs, pleura, muscles of respiration) are also essential





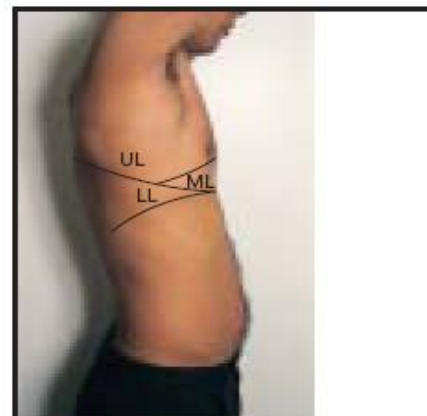
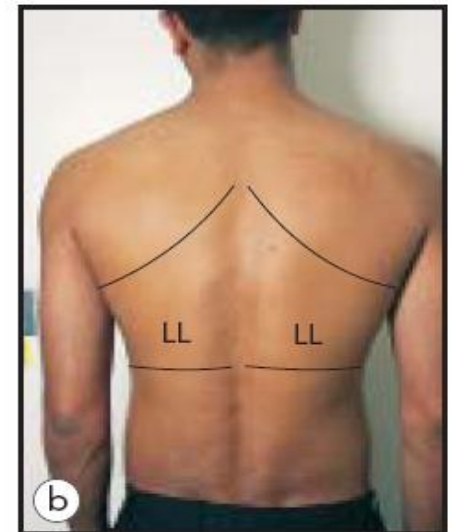
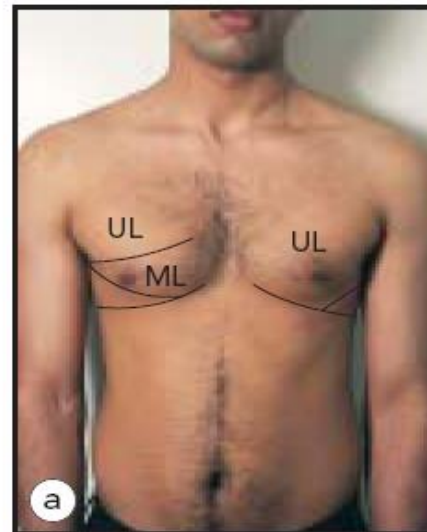
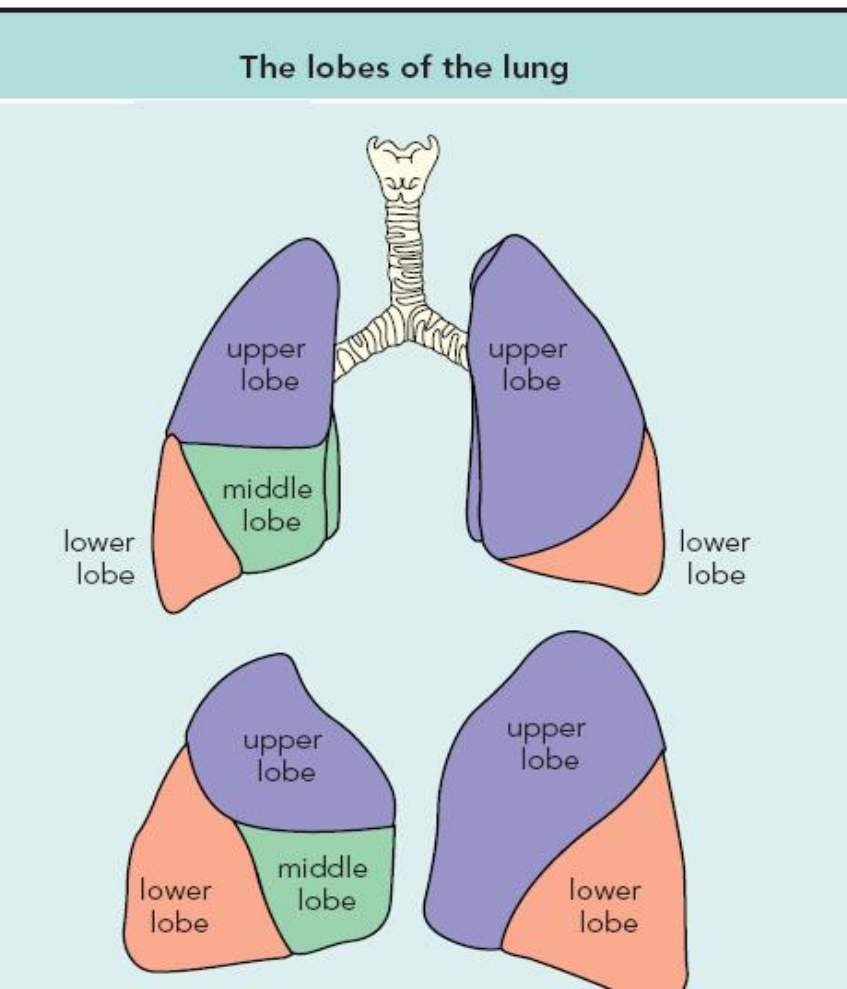
Physiology of Respiration

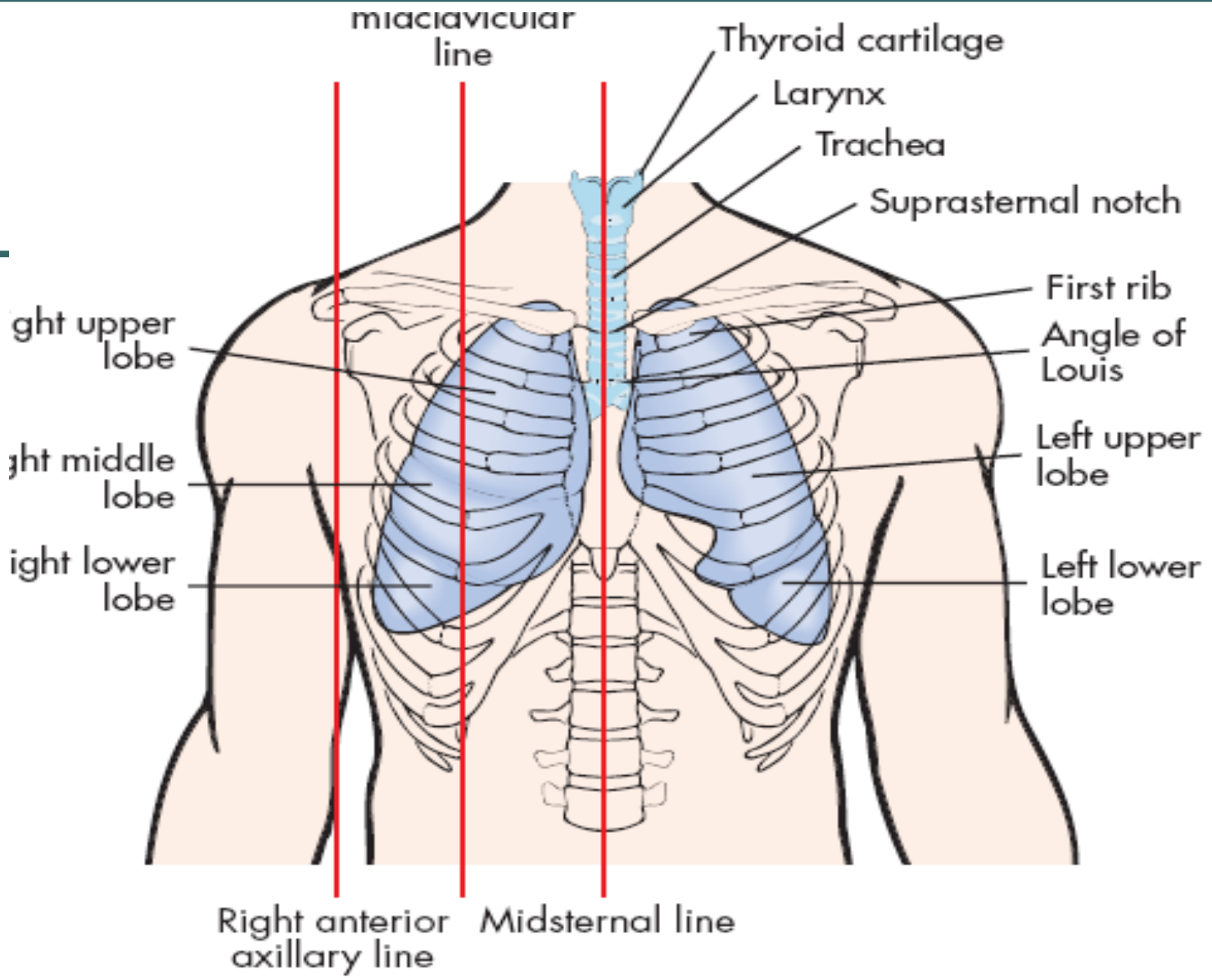
- **Ventilation. Ventilation** involves *inspiration* (movement of air into the lungs) and *expiration* (movement of air out of the lungs).
- Air moves in and out of the lungs because intrathoracic pressure changes in relation to pressure at the airway opening.
- Contraction of the diaphragm and intercostal and scalene muscles increases chest dimensions, thereby decreasing intrathoracic pressure.
- Gas flows from an area of higher pressure (atmospheric) to one of lower pressure (intrathoracic)

Surface markings of the lobes of the lung:

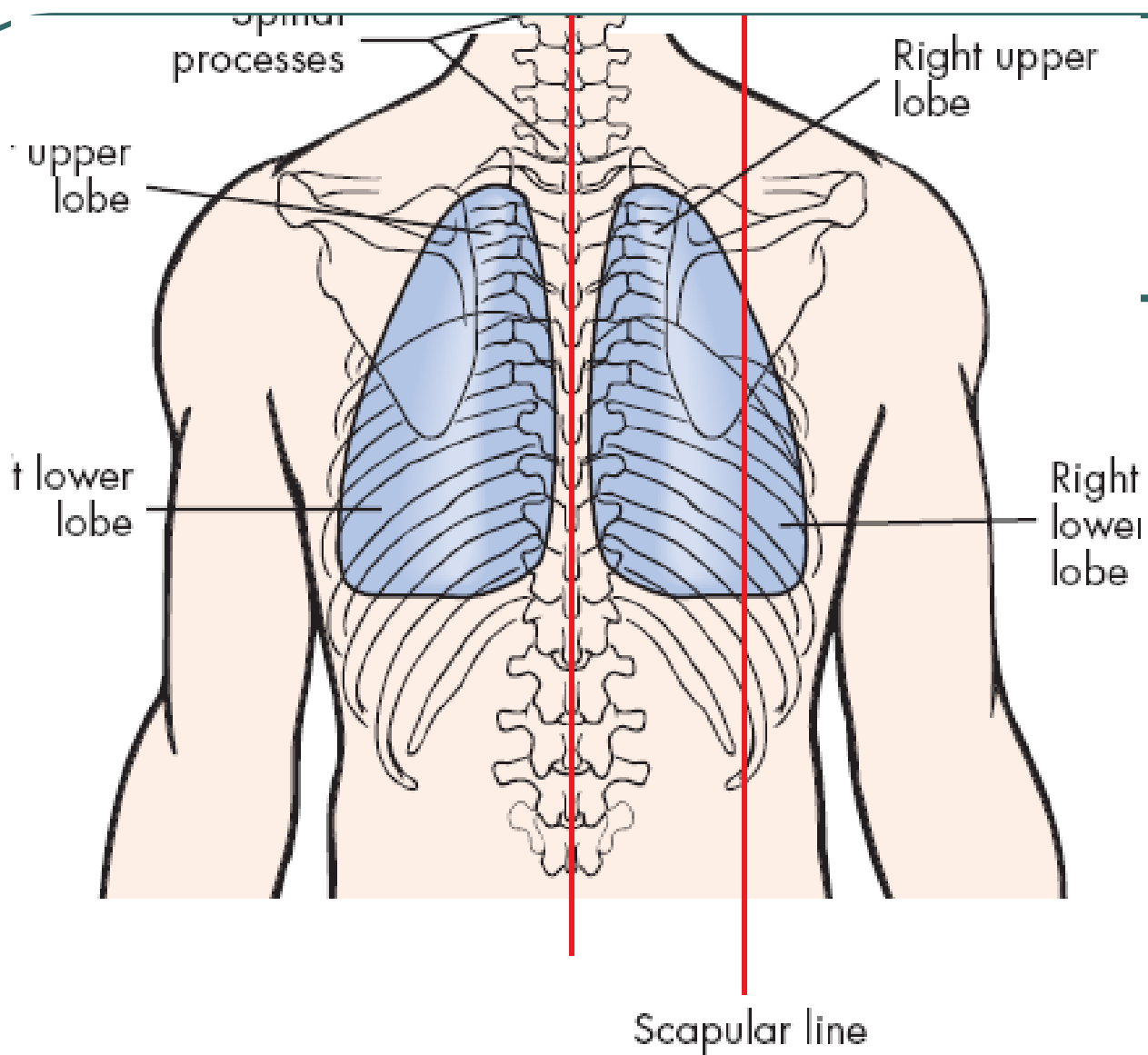
(a) anterior, (b) posterior, (c) right lateral and (d) left lateral.
(UL, upper lobe; ML, middle lobe; LL, lower lobe).

Fig. 5.2 Normal radiograph: posteroanterior view (left) and right lateral view (right).





A



25-2 Landmarks and structures of the chest wall. A, Anterior

Position/Lighting/Draping

- Position –
 - patient should sit upright on the examination table.
 - The patient's hands should remain at their sides.
 - When the back is examined the patient is usually asked to move their arms forward) *hug themselves position* (so that they are not in the way of examining the upper scapulae lung fields).
- Lighting - adjusted so that it is ideal.
- Draping - the chest should be fully exposed. Exposure time should be minimized.

The basic steps of the examination

- can be remembered with the mnemonic IPPA:
- **Inspection**
- **Palpation**
- **Percussion**
- **Auscultation**

Health History

- Any risk factors for respiratory disease
- smoking
 - pack years (#packs per day x #years smoking)
 - exposure to smoke
 - history of attempts to quit, methods, results
- sedentary lifestyle, immobilization
- age
- environmental exposure
 - Dust, chemicals, asbestos, air pollution
- obesity
- family history

Cough

- Type
 - dry, moist, wet, productive, hoarse, hacking, barking, whooping
- Onset
- Duration
- Pattern
 - activities, time of day, weather
- Severity
 - effect on ADLs (activities of daily living)
- Wheezing
- Associated symptoms
- Treatment and effectiveness

sputum

- amount
- color
- presence of blood (hemoptysis)
- odor
- consistency
- pattern of production

Past Health History

- Respiratory infections or diseases (URI)
- Trauma
- Surgery
- Chronic conditions of other systems
- **Family Health History**
- Tuberculosis
- Emphysema
- Lung Cancer
- Allergies
- Asthma

Inspection

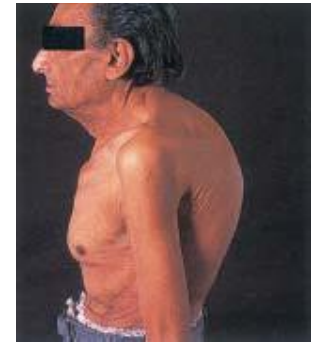
- Tracheal deviation (can suggest of tension pneumothorax)
- **Chest wall deformities]**
- Kyphosis - curvature of the spine - anterior-posterior
- Scoliosis - curvature of the spine - lateral
- Barrel chest - chest wall increased anterior-posterior; normal in children; typical of hyperinflation seen in COPD
- Pectus excavatum
- Pectus carinatum



Thoracoplasty
with secondary
changes in the
spine.



Pectus excavatum



Kyphosis

Signs of respiratory distress

- Cyanosis - person turns blue
- Pursed-lip breathing - seen in COPD (used to increase end expiratory pressure (
- Accessory muscle use) scalene muscles (
- Diaphragmatic paradox - the diaphragm moves opposite of the normal direction on inspiration; suspect flail segment in trauma
- Intercostal indrawing



'blue bloater'
showing ascites
from marked cor
pulmonale.



'pink puffer'. Note the
pursed-lip
breathing

Pink Puffer

A descriptive term for a patient with COPD and severe emphysema, who has a pink complexion and dyspnea •

Blue Bloater

A popular term for the appearance of a patient with COPD with symptoms of chronic bronchitis, normal to decreased lung capacity, PO_2 , increased PCO_2 —despite normal diffusing capacity, cyanosis and right heart failure, due to sleep apnea and progressive chronic pulmonary hypertension; with time, it becomes indistinguishable from other forms of COPDs

CHRONIC BRONCHITIS

CLINICAL DIAGNOSIS: DAILY PRODUCTIVE COUGH FOR THREE MONTHS OR MORE, IN AT LEAST TWO CONSECUTIVE YEARS

OVERWEIGHT AND CYANOTIC



ELEVATED HEMOGLOBIN



PERIPHERAL EDEMA

RHONCHI AND WHEEZING



EMPHYSEMA

PATHOLOGIC DIAGNOSIS: PERMANENT ENLARGEMENT AND DESTRUCTION OF AIRSPACES DISTAL TO THE TERMINAL BRONCHIOLE

OLDER AND THIN



SEVERE DYSPNEA

QUIET CHEST

X-RAY: HYPERINFLATION WITH FLATTENED DIAPHRAGMS



Palpation

Tactile fremitus

is vibration felt by palpation.

-Place your open palms against the upper portion of the anterior chest, making sure that the fingers do not touch the chest.

- Ask the patient to repeat the phrase “ninety-nine” or another resonant phrase while you systematically move your palms over the chest from the central airways to each lung’s periphery.

-You should feel vibration of equally intensity on both sides of the chest. Examine the posterior thorax in a similar manner.

- The fremitus should be felt more strongly in the upper chest with little or no fremitus being felt in the lower chest



Assessing chest expansion in expiration (left) and inspiration (right).



Percussion over the anterior chest.



Direct percussion of the clavicles for disease in the lung apices



Auscultation

- To assess breath sounds, ask the patient to breathe in and out slowly and deeply through the mouth.
- **Begin at the apex of each lung and zigzag downward between intercostal spaces . Listen with the diaphragm portion of the stethoscope.**



-
- Normal breath sounds
 - Note
 - Pitch
 - Intensity
 - Quality
 - Duration



5.47 Auscultation of the chest using the diaphragm.



Normal Breath Sounds

- **Bronchial** :Heard over the trachea and mainstem bronchi (2nd-4th intercostal spaces either side of the sternum anteriorly and 3rd-6th intercostal spaces along the vertebrae posteriorly). The sounds are described as tubular and harsh. Also known as tracheal breath sounds.
- **Bronchovesicular** :Heard over the major bronchi below the clavicles in the upper of the chest anteriorly. Bronchovesicular sounds heard over the peripheral lung denote pathology. The sounds are described as medium-pitched and continuous throughout inspiration and expiration.
- **Vesicular** :Heard over the peripheral lung. Described as soft and low-pitched. Best heard on inspiration.
- **Diminished** :Heard with shallow breathing; normal in obese patients with excessive adipose tissue and during pregnancy. Can also indicate an obstructed airway, partial or total lung collapse, or chronic lung disease.



Tactile Fremitus

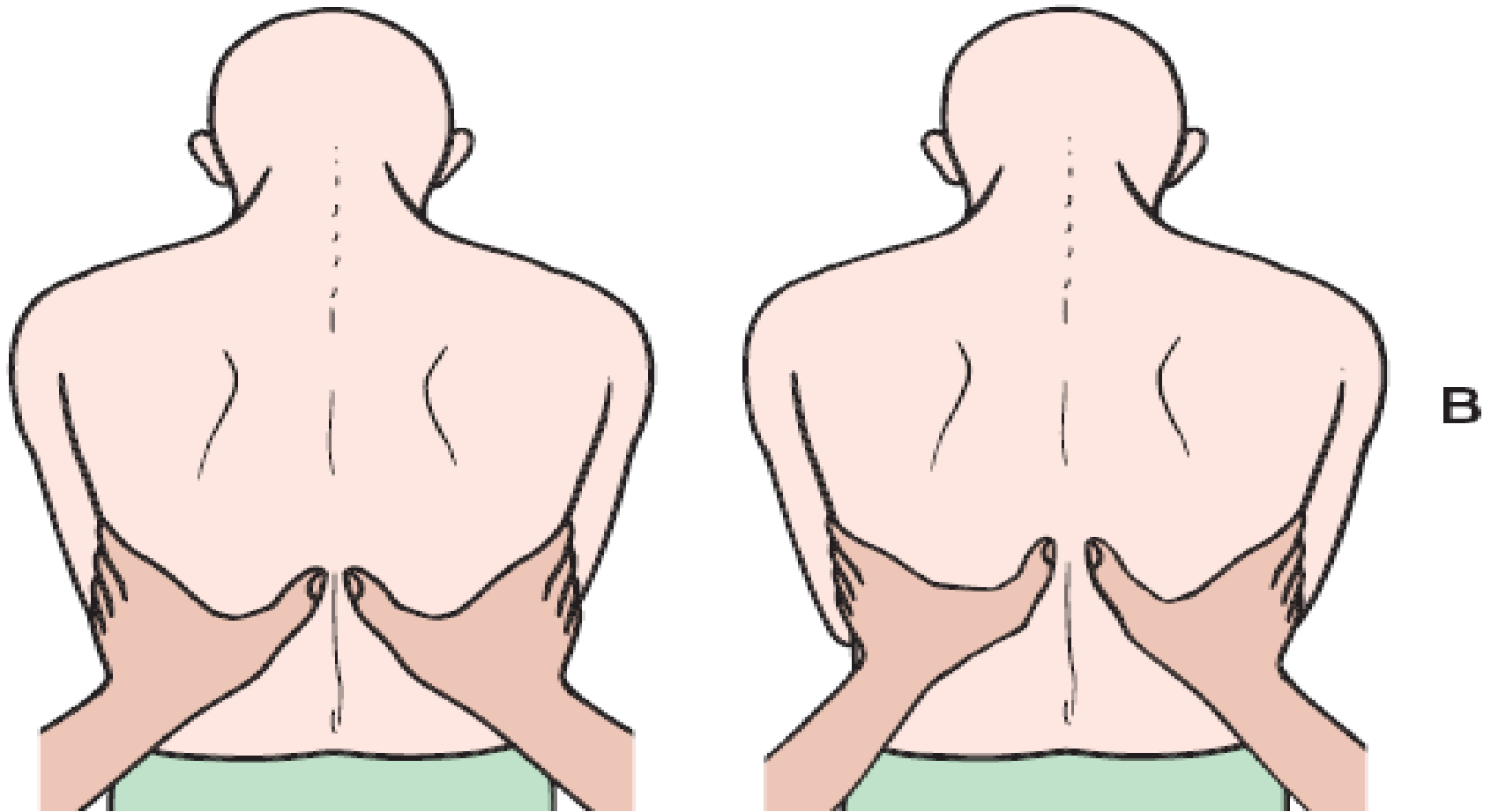


FIG. 25-10 Estimation of thoracic expansion. A, Exhalation. B, Maximal inhalation.

Tactile Fremitus

- Ask the patient to say "ninety-nine" several times in a normal voice.
- Palpate using the ball of your hand .
- You should feel the vibrations transmitted through the airways to the lung .
- Increased tactile fremitus suggests consolidation of the underlying lung tissues

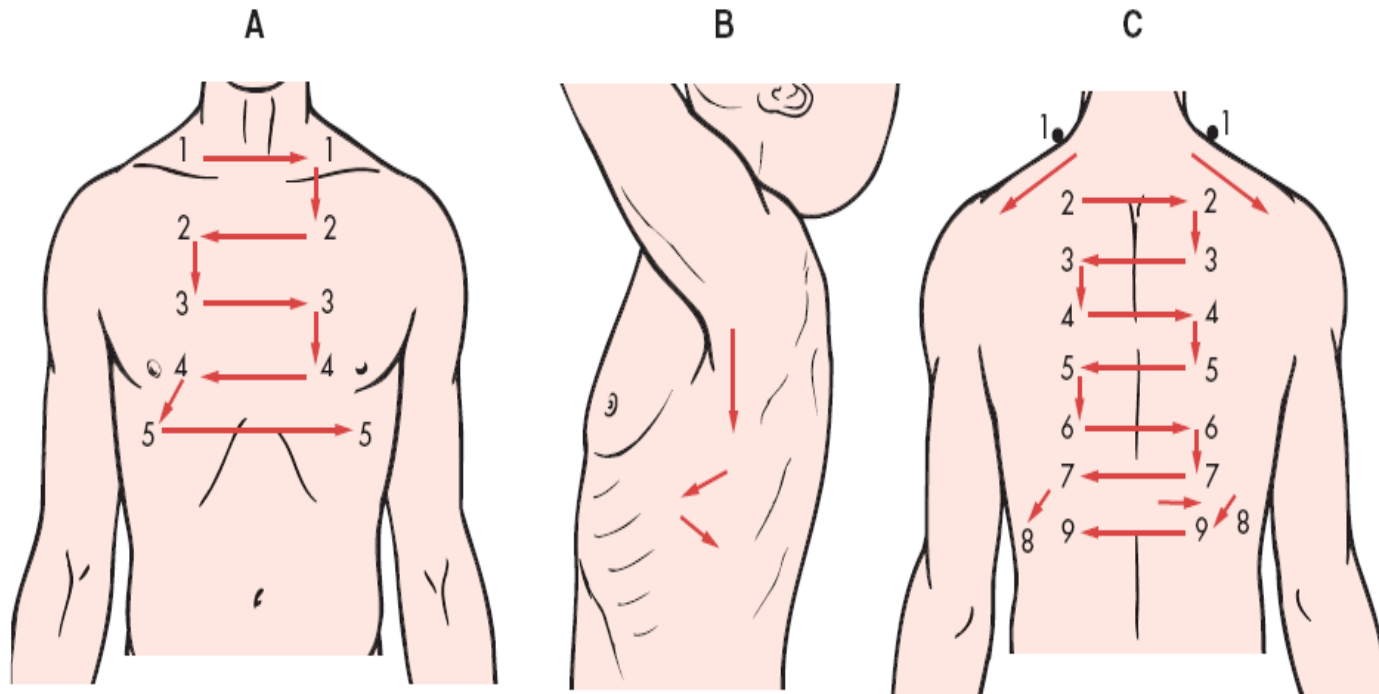
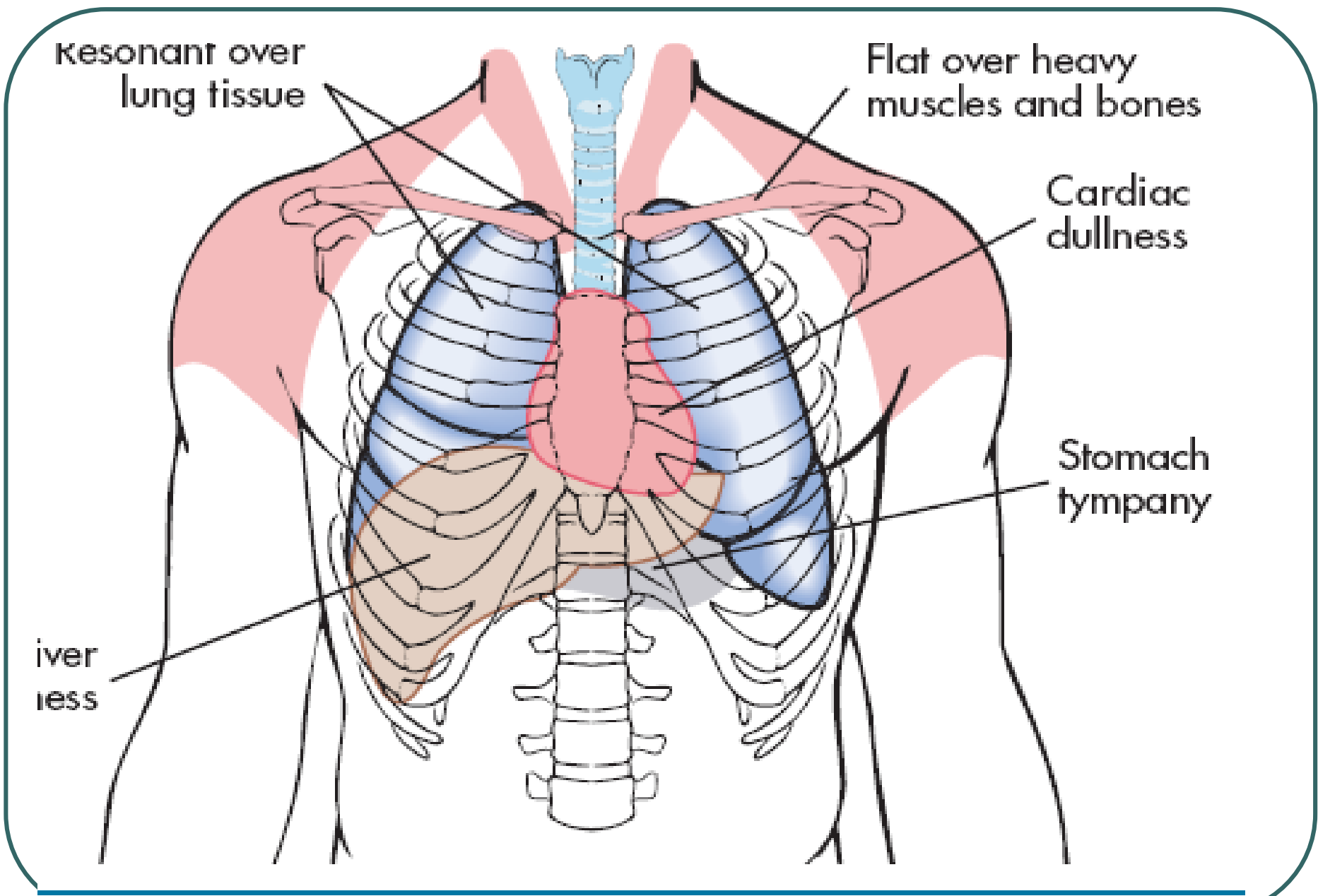


FIG. 25-11 Sequence for examination of the chest. **A**, Anterior sequence. **B**, Lateral sequence. **C**, Posterior sequence. For palpation, place the palms of the hands in the position designated as "1" on the right and left sides of the chest. Compare the intensity of vibrations. Continue for all positions in each sequence. For percussion, tap the chest at each designated position, moving downward from side to side, while comparing percussion notes. For auscultation, place the stethoscope at each position and listen to at least one complete inspiratory and expiratory cycle.

SOUND**DESCRIPTION**

Resonance	Low-pitched sound heard over normal lungs
Hyperresonance	Loud, lower-pitched sound than normal resonance heard over hyperinflated lungs, such as in chronic obstructive lung disease and acute asthma
Tympany	Drumlike, loud, empty quality heard over gas-filled stomach or intestine, or pneumothorax
Dull	Medium-intensity pitch and duration heard over areas of "mixed" solid and lung tissue, such as over the top area of the liver, partially consolidated lung tissue (pneumonia), or fluid-filled pleural space
Flat	Soft, high-pitched sound of short duration heard over very dense tissue where air is not present



25-12 Diagram of percussion areas and sounds in the anterior

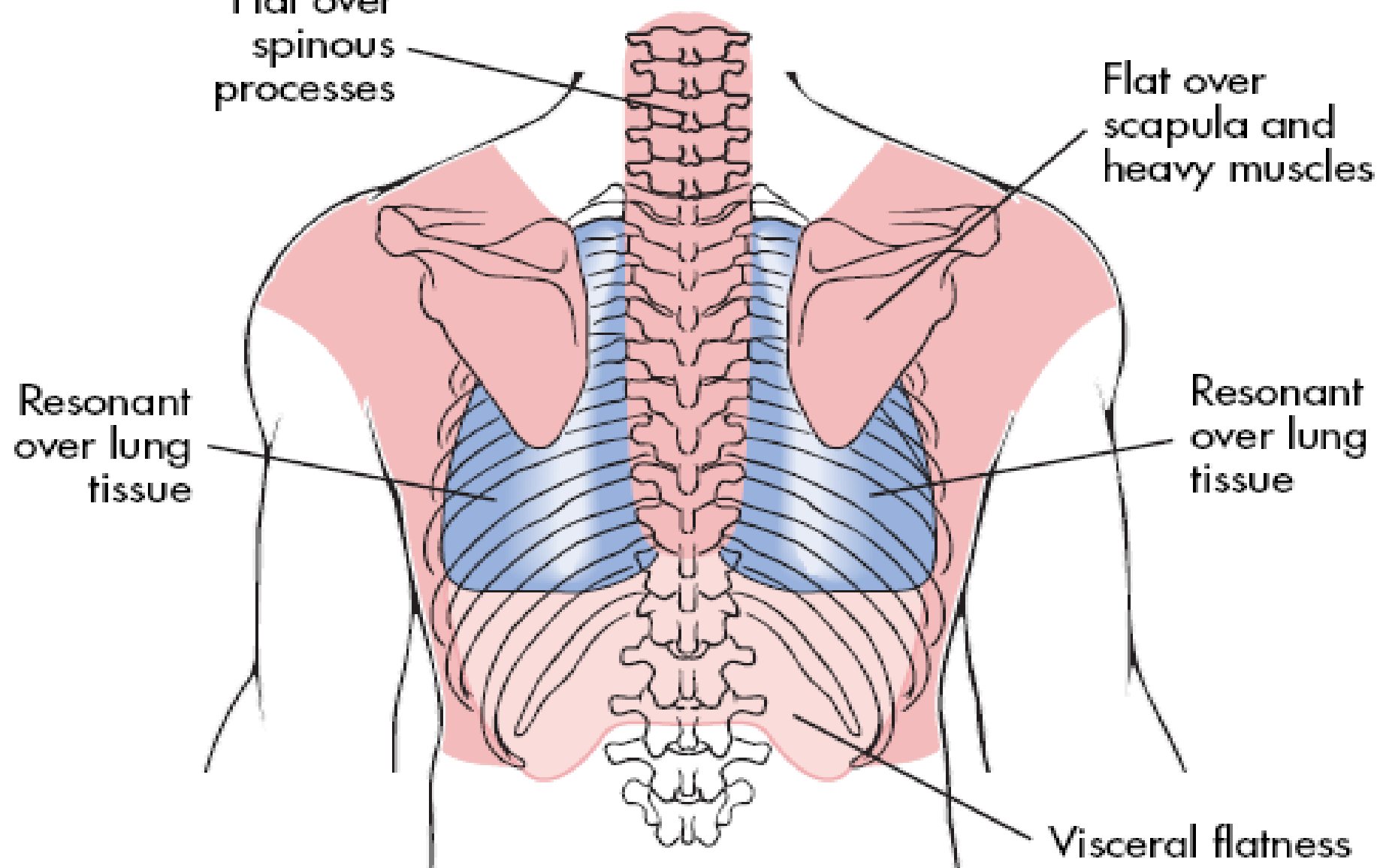
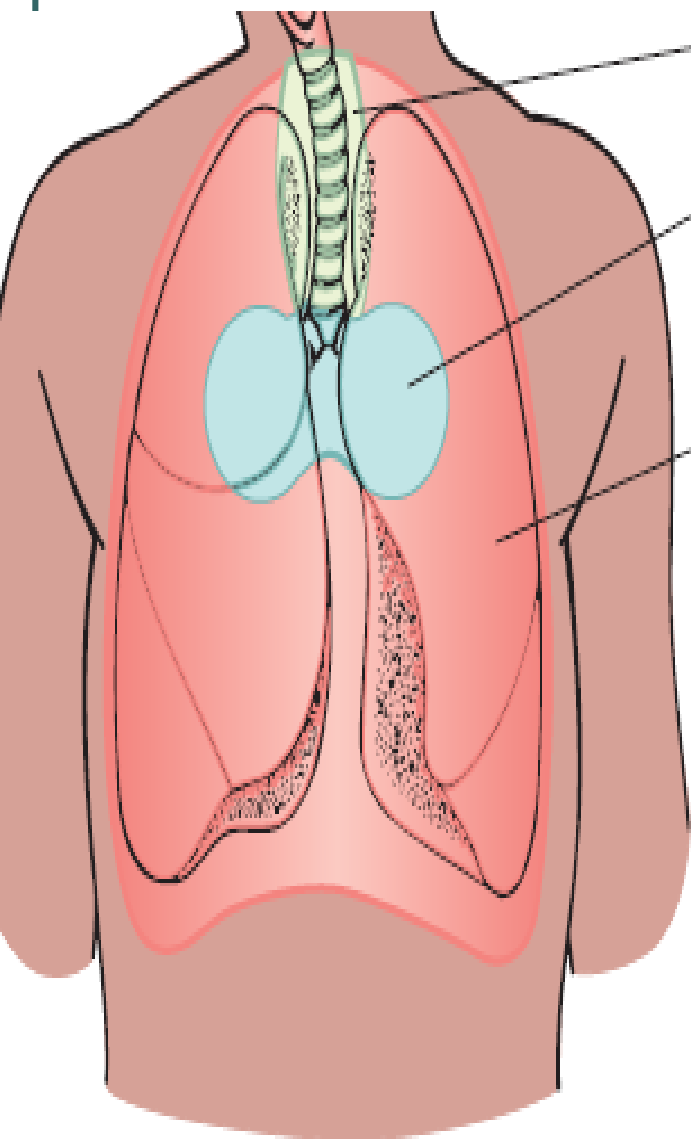


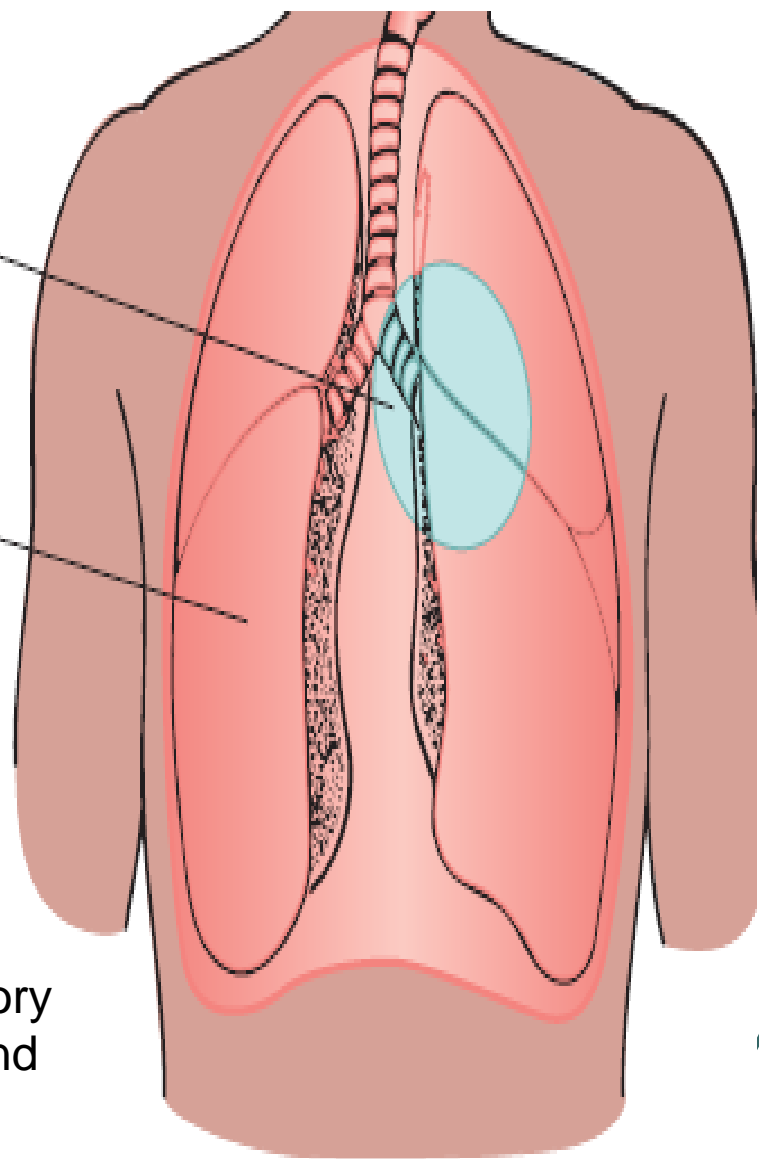
FIG. 25-13 Diagram of percussion areas and sounds in the posterior side of the chest. Percussion proceeds from the lung apices to the lung bases, comparing sounds in opposite areas of the chest.



Bronchial over trachea

Bronchovesicular over main bronchi

Vesicular over lesser bronchi, bronchioles, and lobes



Normal auscultatory sound

Muchas Gracias Al Final

WHAT DO YOU CALL AN
ALLIGATOR IN A VEST?



AN INVESTIGATOR.