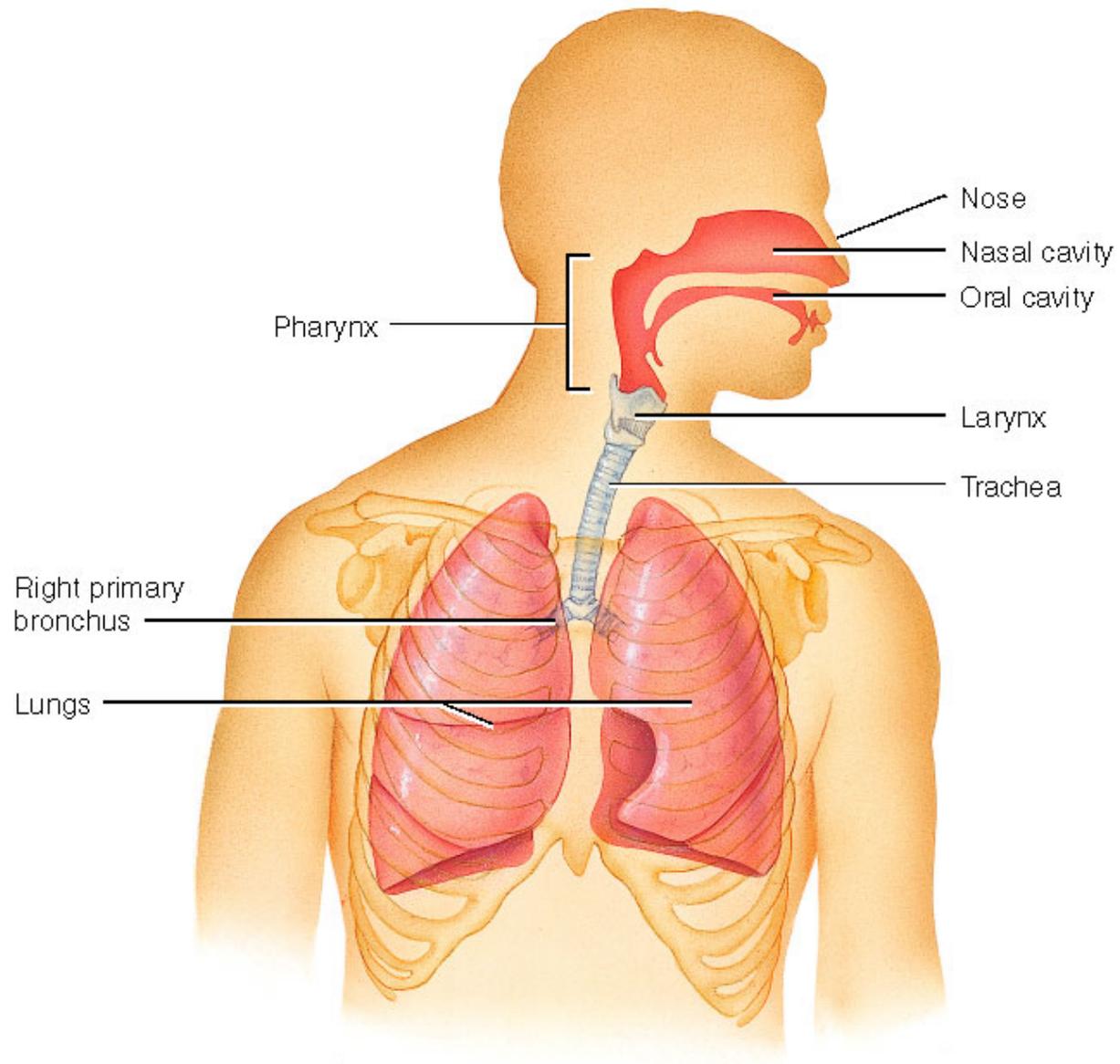
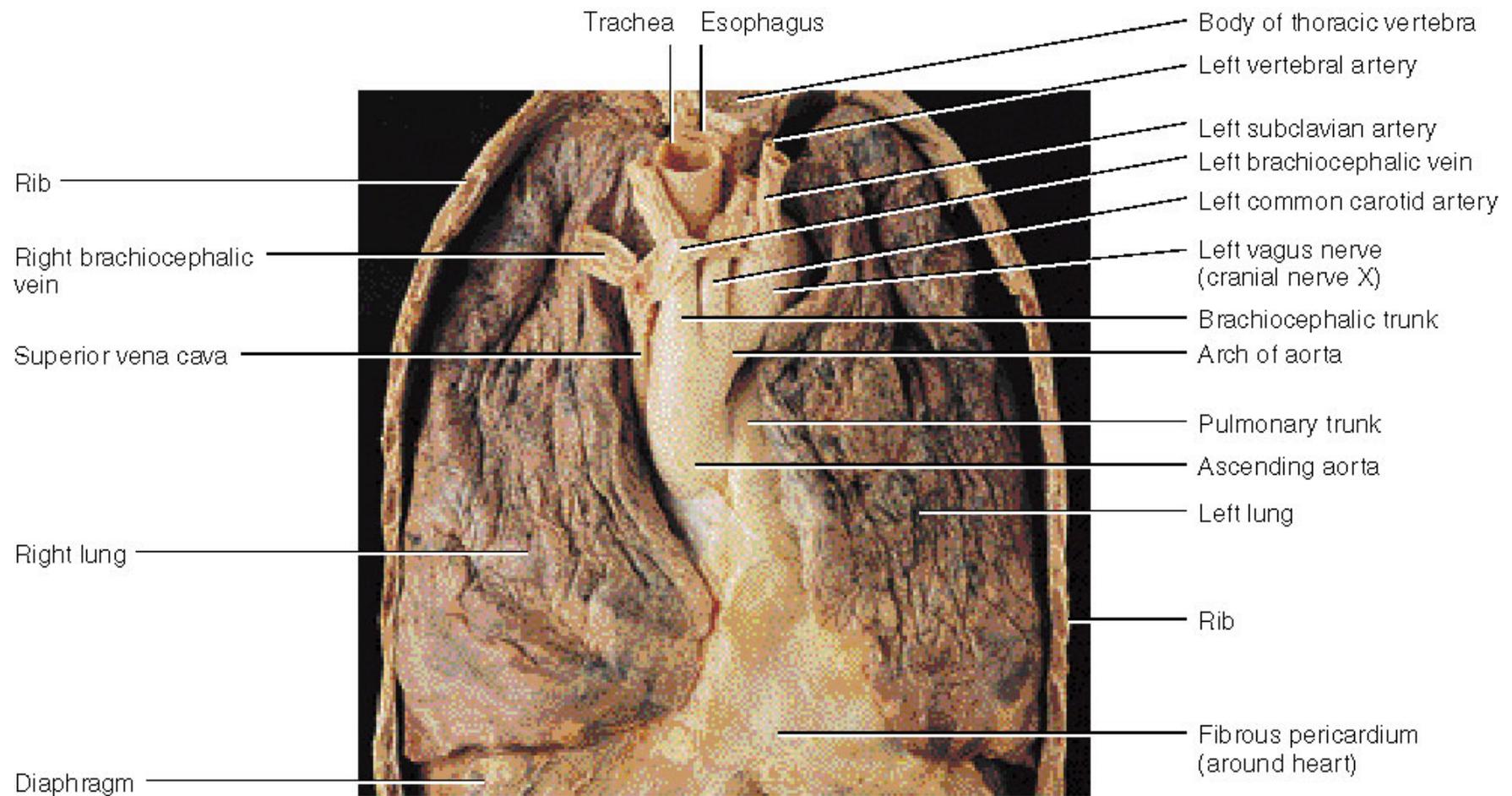


Respiratory System

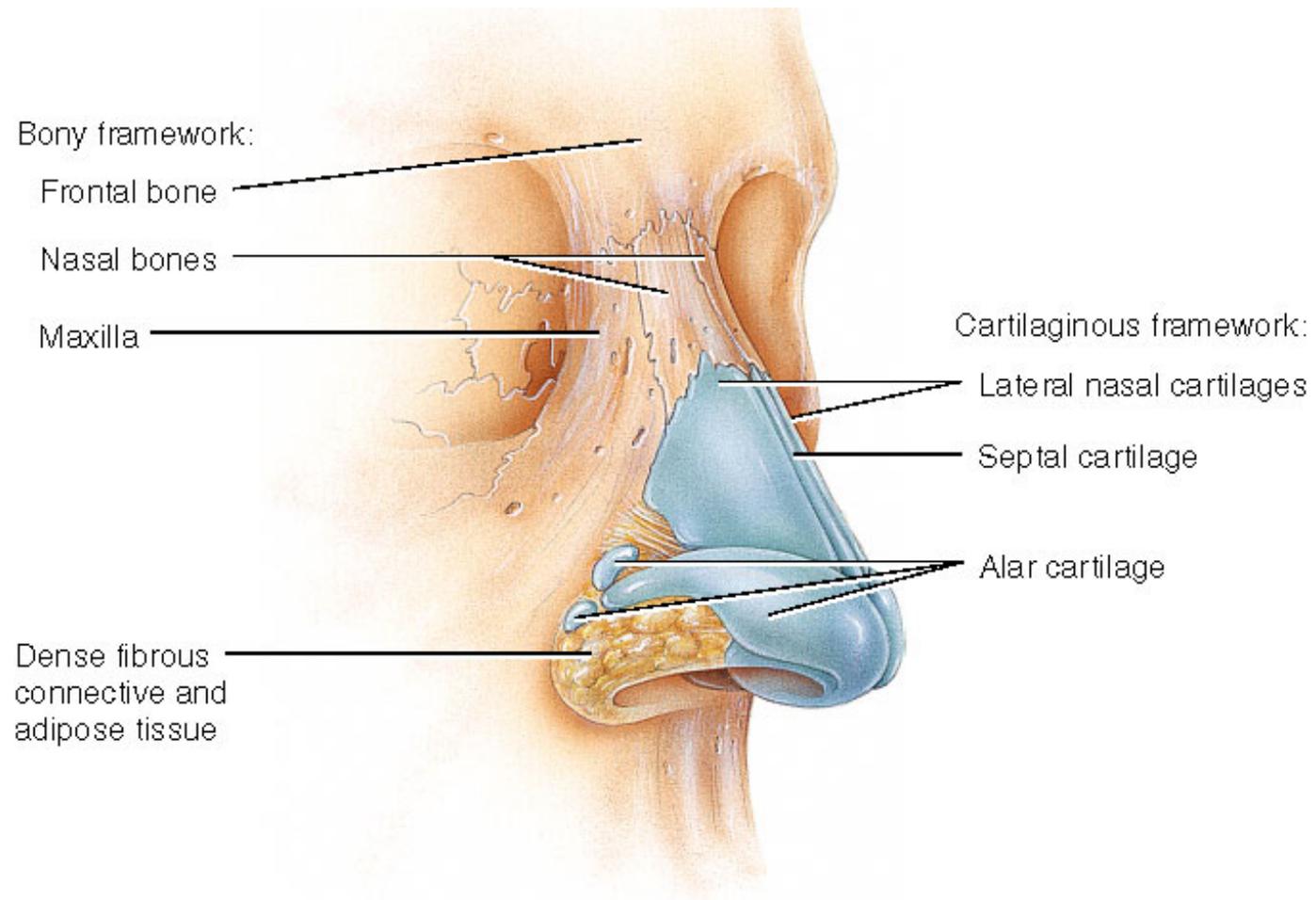
(a) Anterior view showing organs of respiration



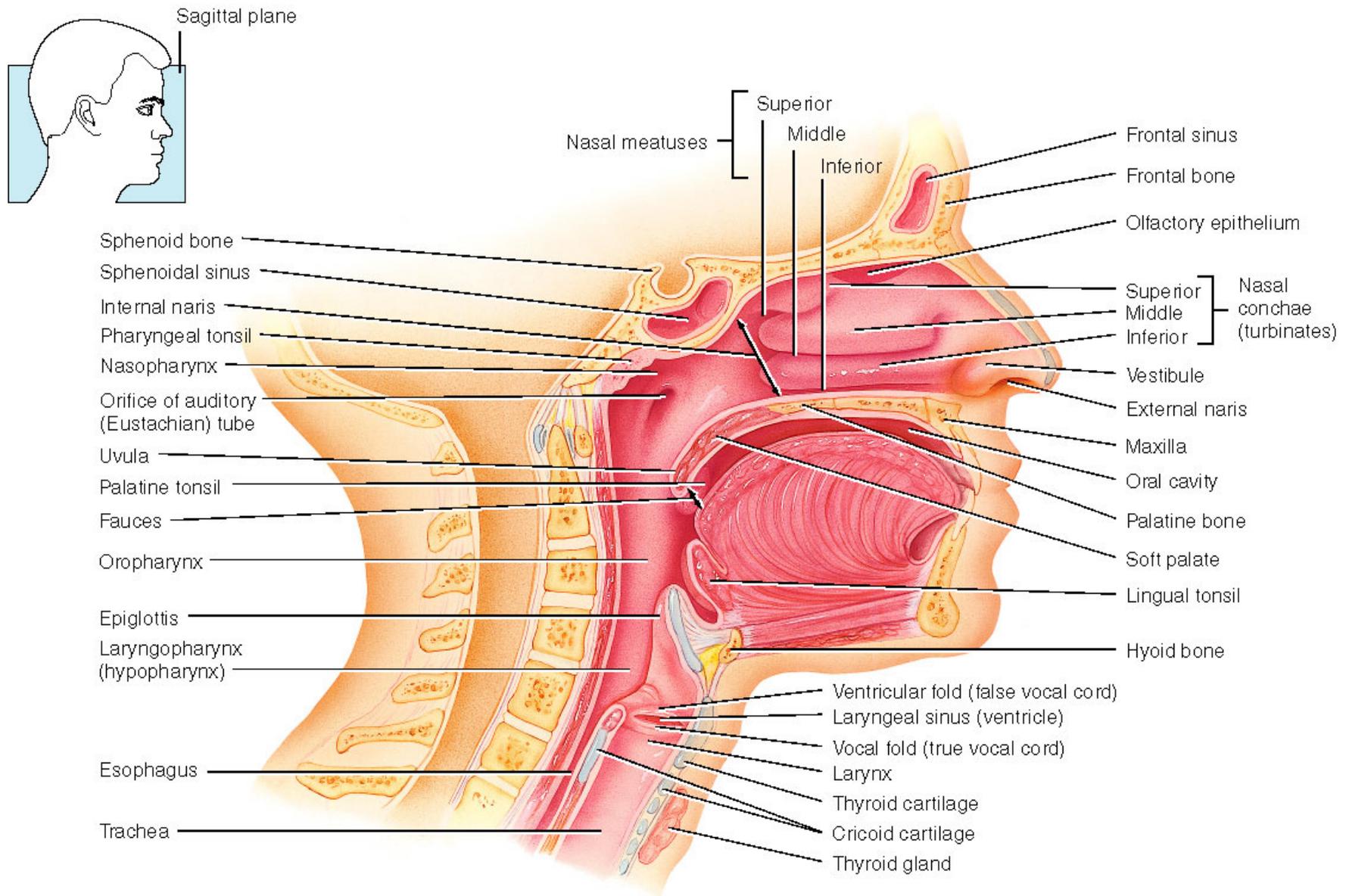
(a) Anterior view showing organs of respiration



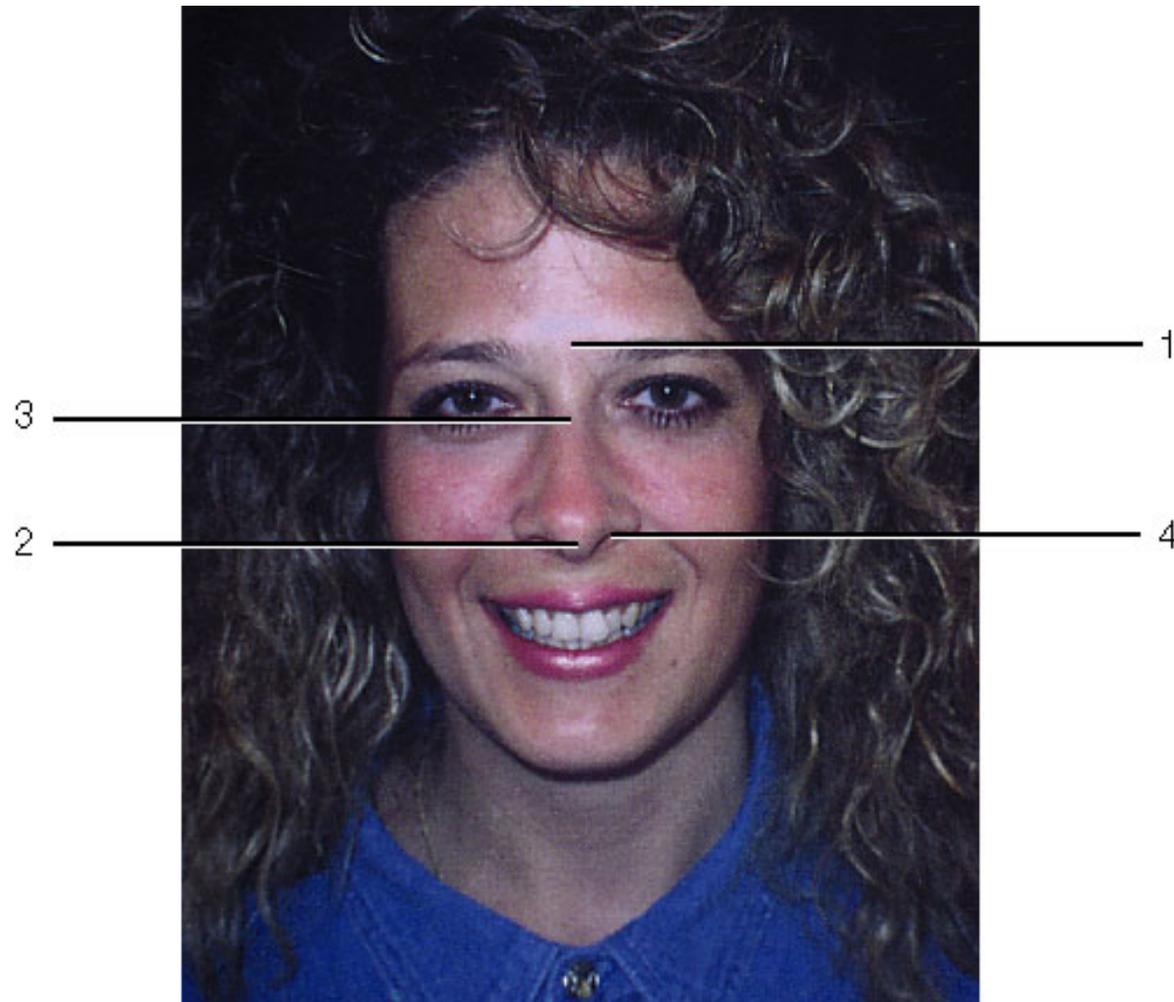
(b) Anterior view of the lungs after removal of the anterolateral thoracic wall and parietal pleura



(a) Anterolateral view of external portion of nose showing cartilaginous and bony framework

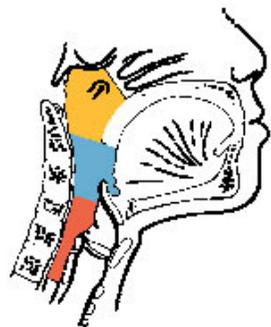
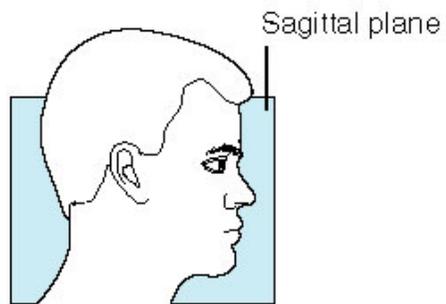


(b) Sagittal section of the left side of the head and neck showing the location of respiratory structures



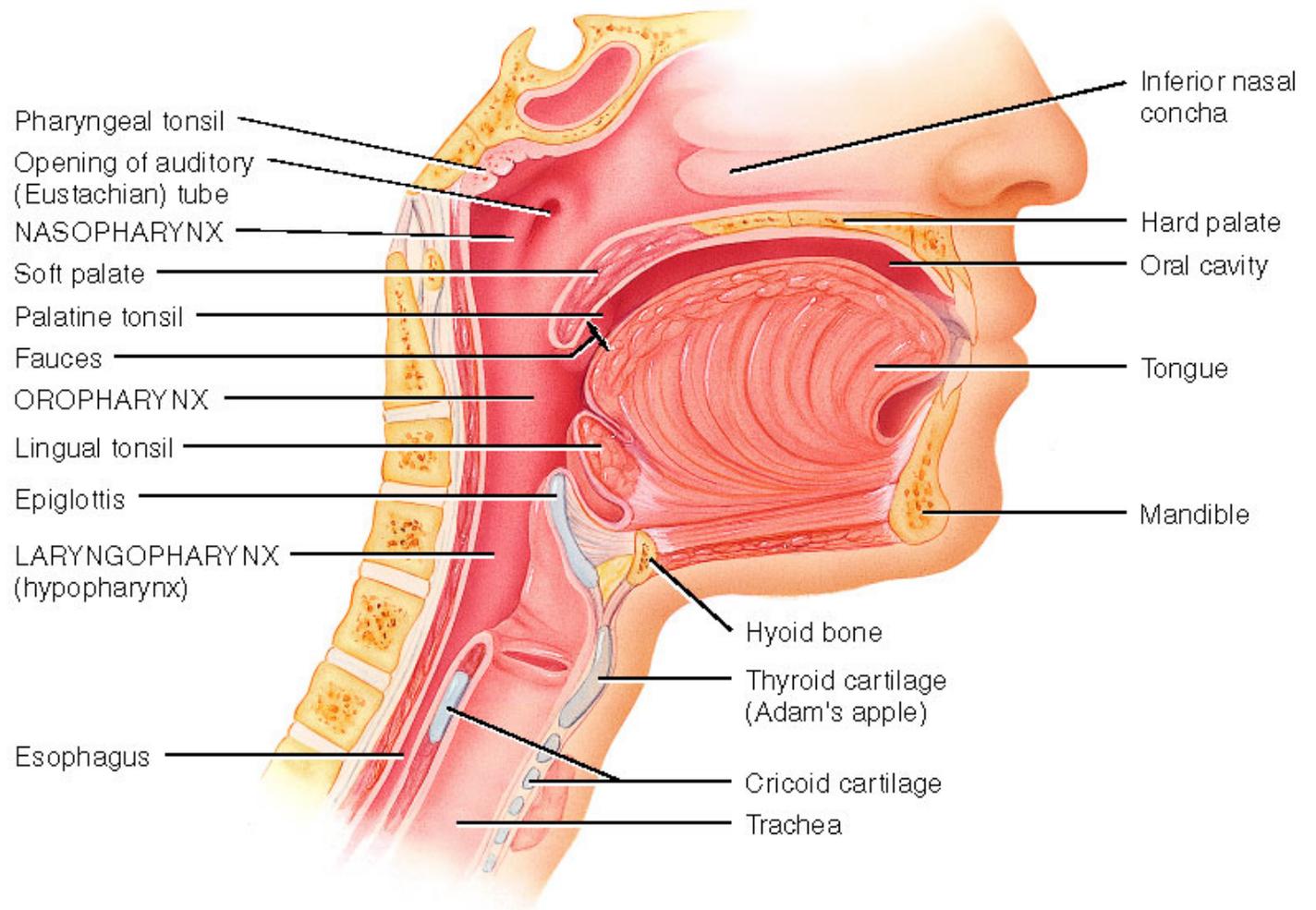
Anterior view

1. **Root**: Superior attachment of the nose to the frontal bone
2. **Apex**: Tip of nose
3. **Bridge**: Bony framework of nose formed by nasal bones
4. **External naris**: Nostril; external opening into nasal cavity

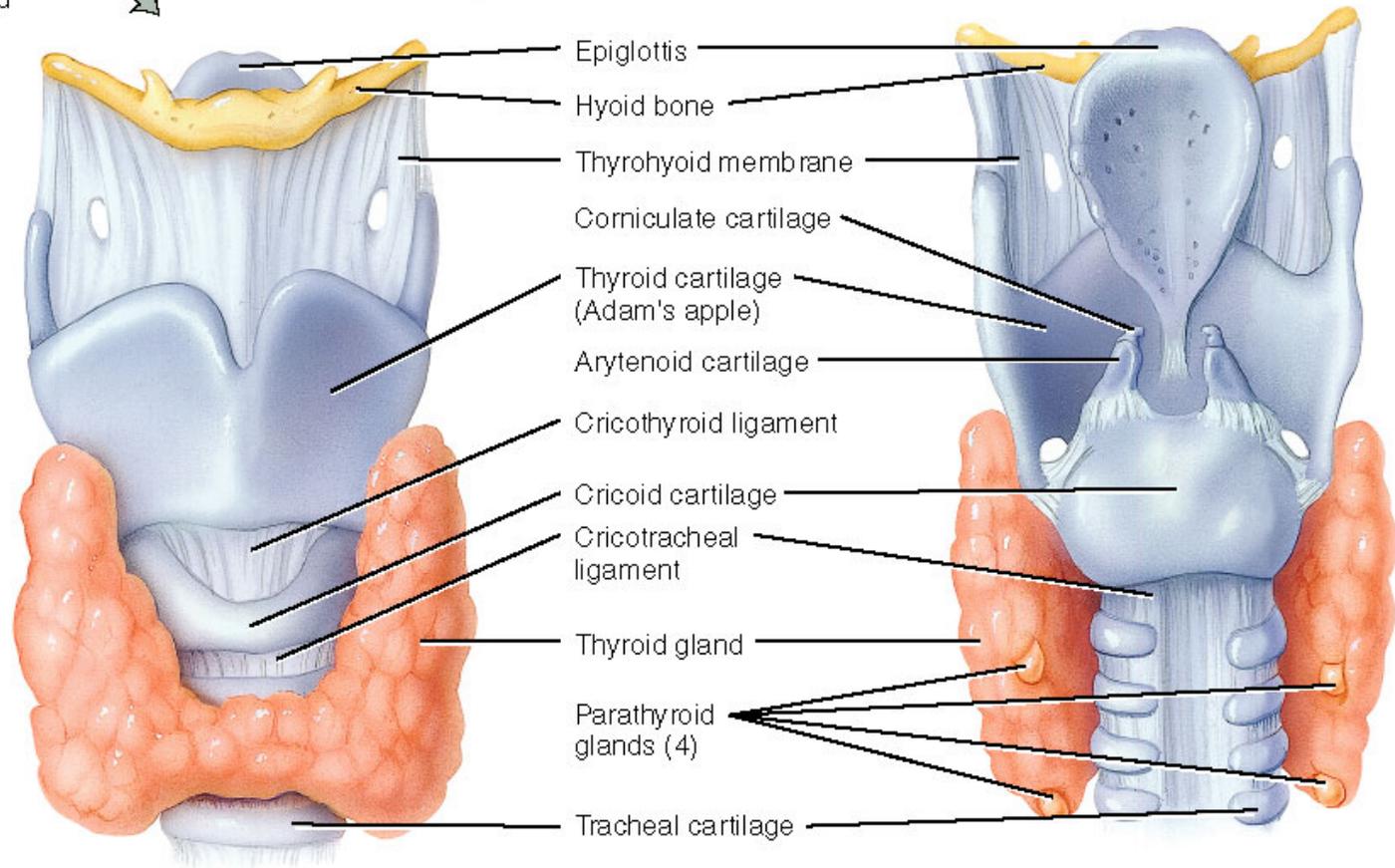
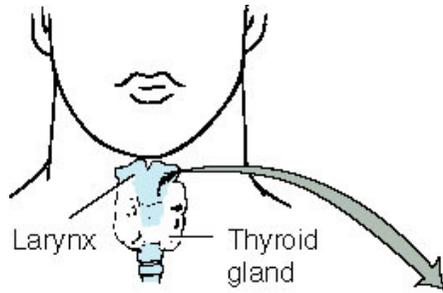


- Nasopharynx
- Oropharynx
- Laryngopharynx

Regions of the pharynx

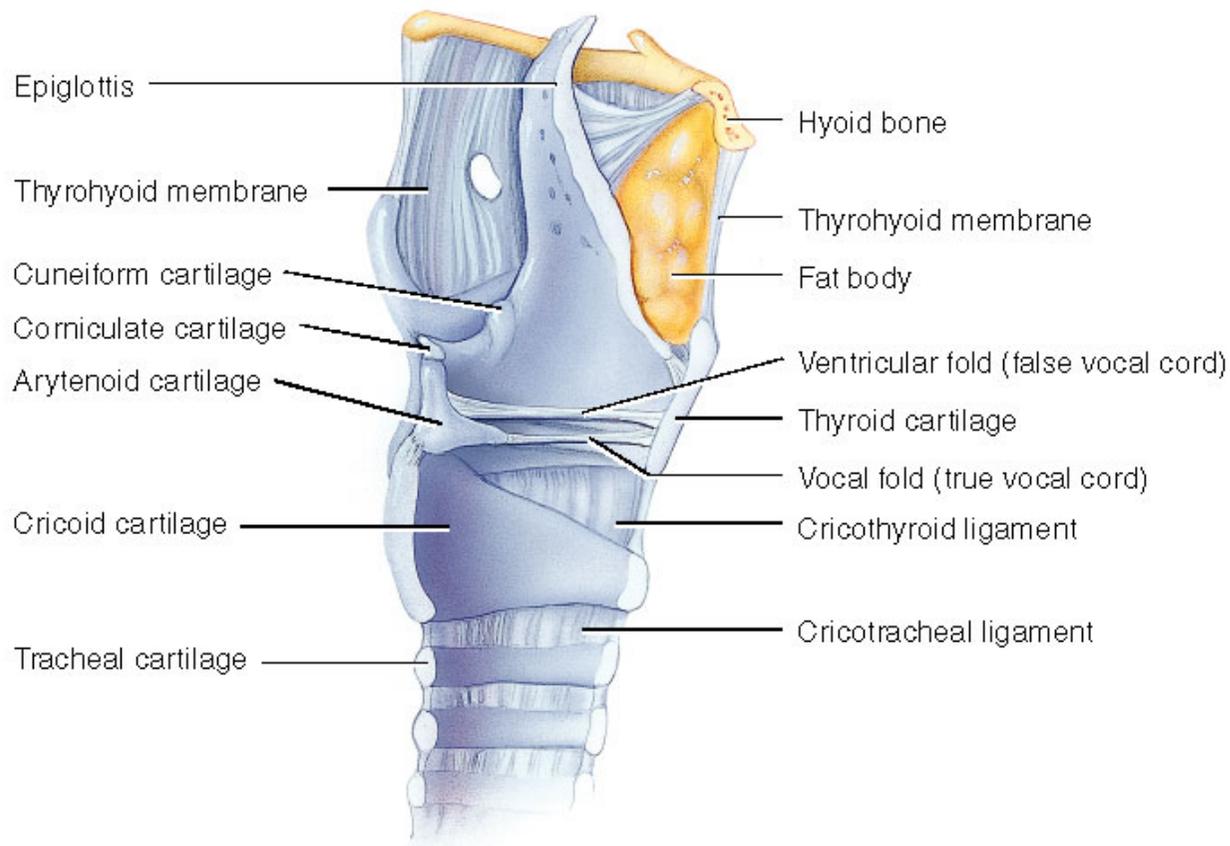
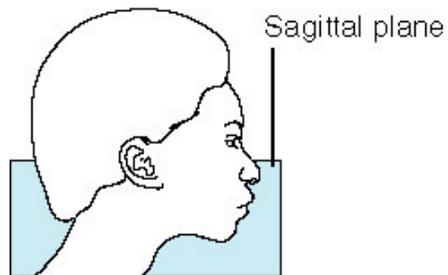


Sagittal section showing the regions of the pharynx



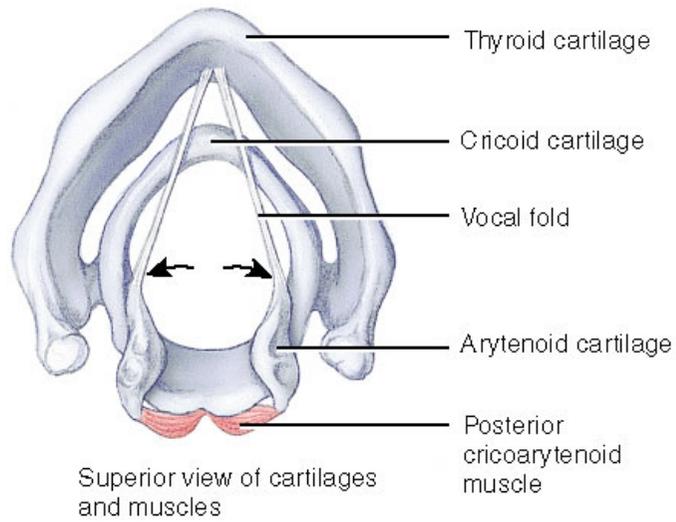
(a) Anterior view

(b) Posterior view

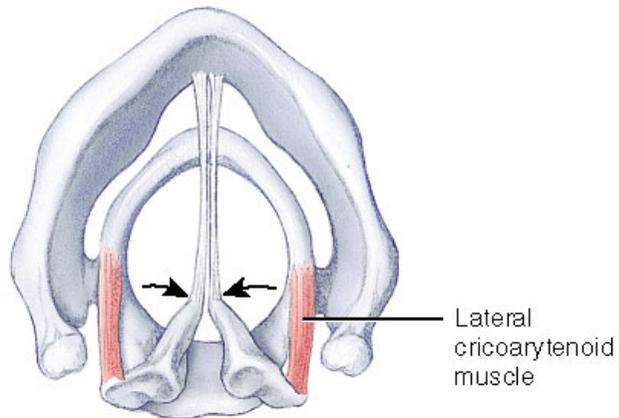
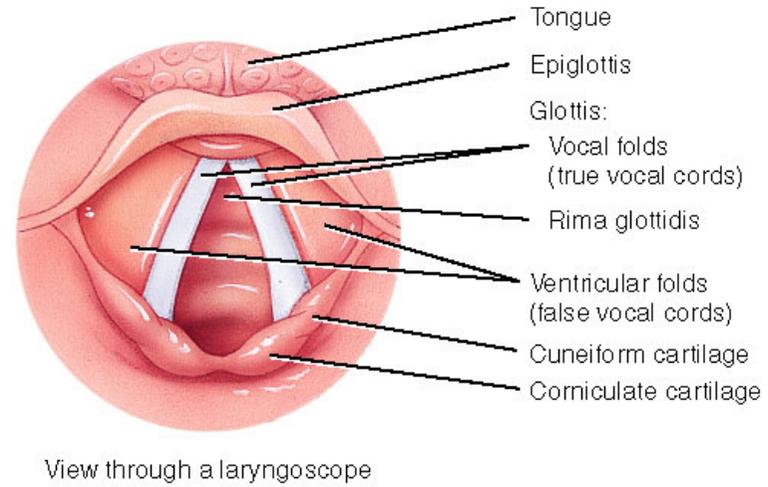


(c) Sagittal section

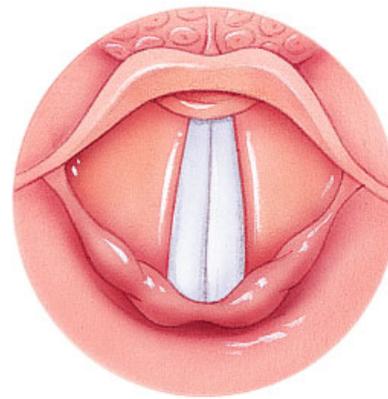
23.05c

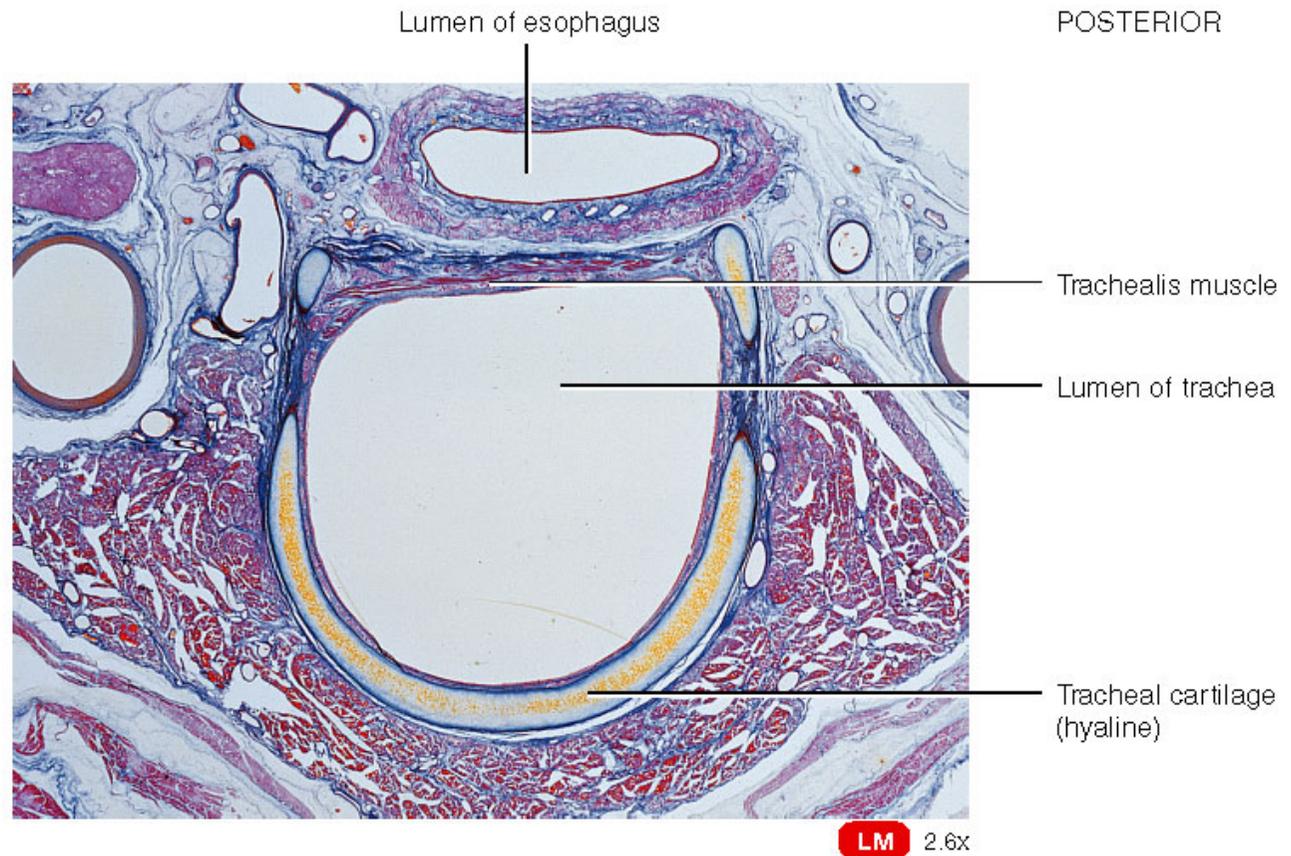
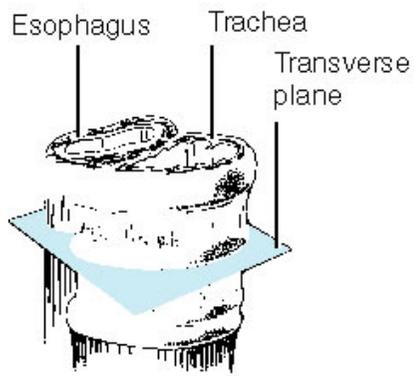


(a) Movement of vocal folds apart (abduction)



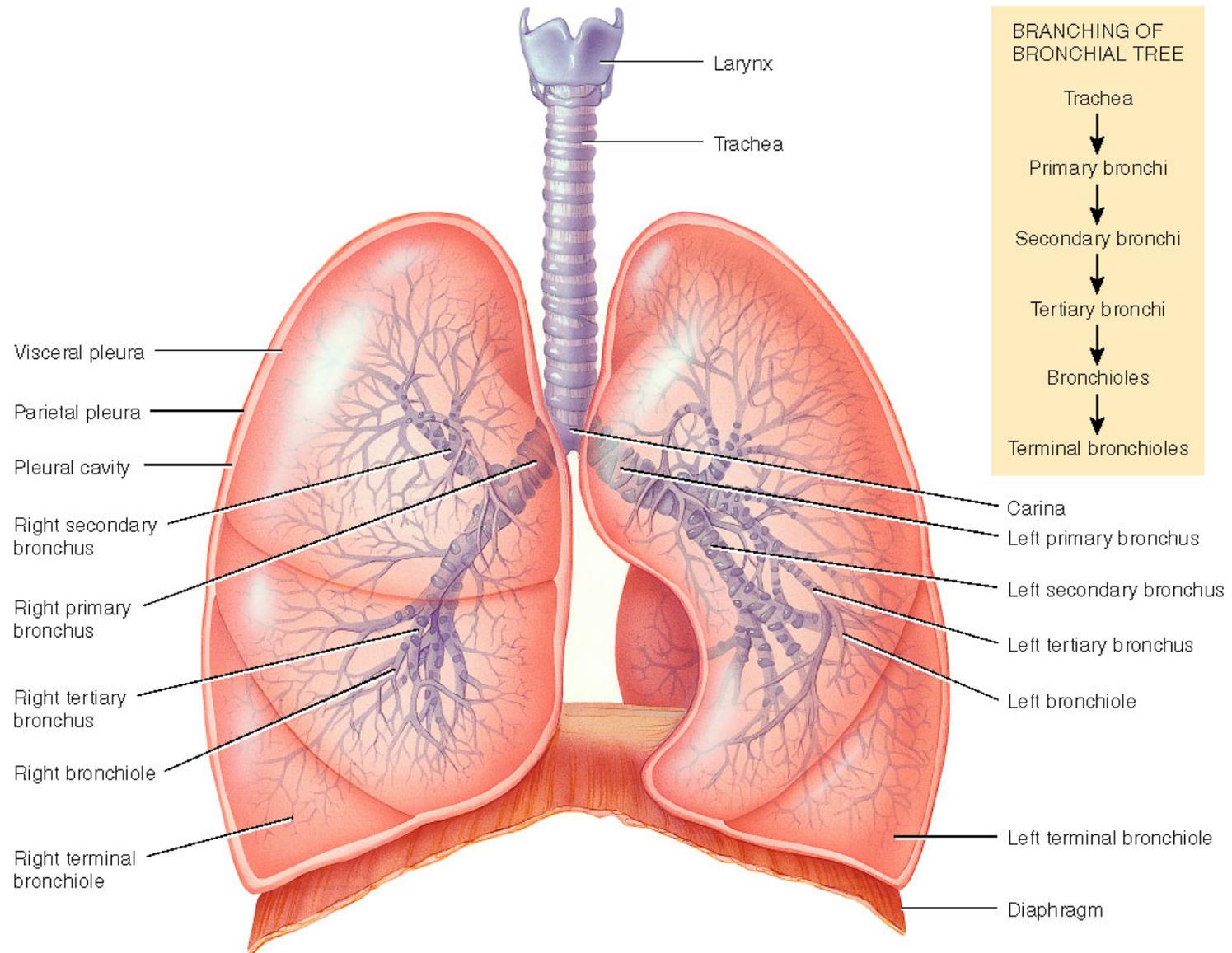
(b) Movement of vocal folds together (adduction)



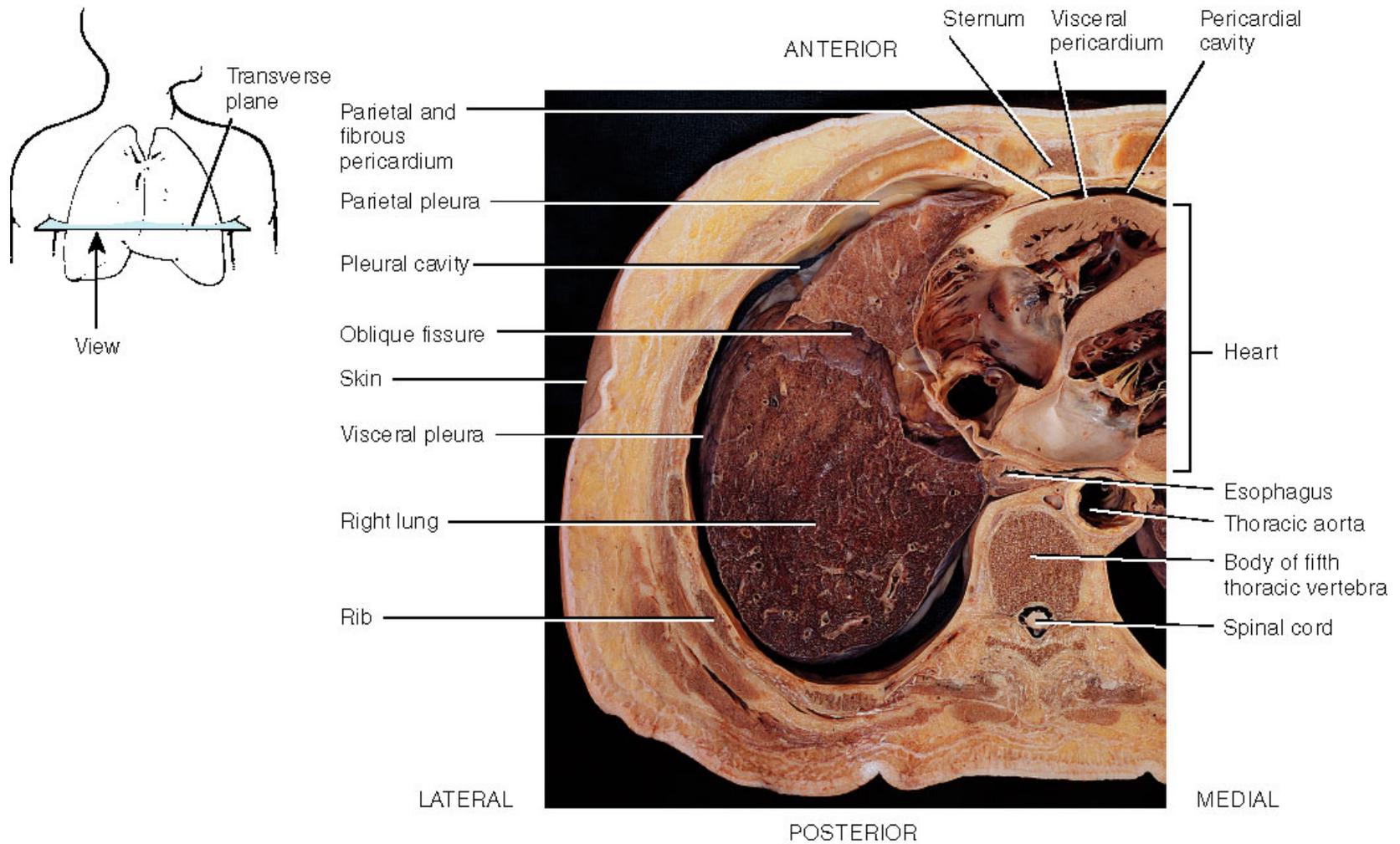


Transverse section of the trachea and esophagus

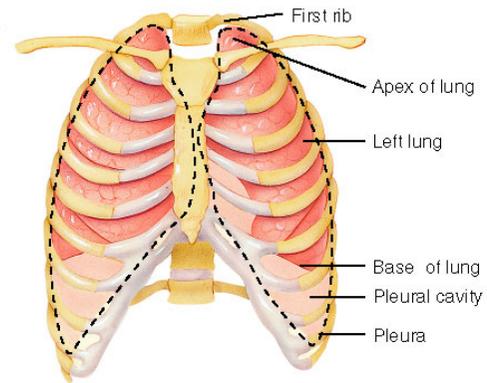
ANTERIOR



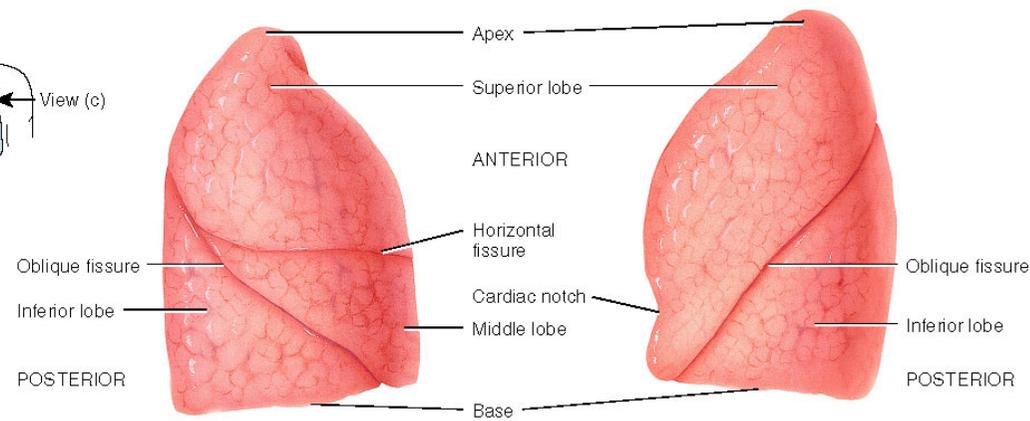
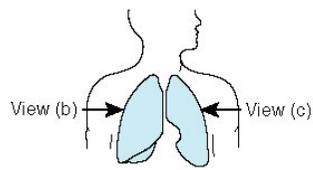
Anterior view



Inferior view of a transverse section through the thoracic cavity showing the pleural cavity and pleural membranes

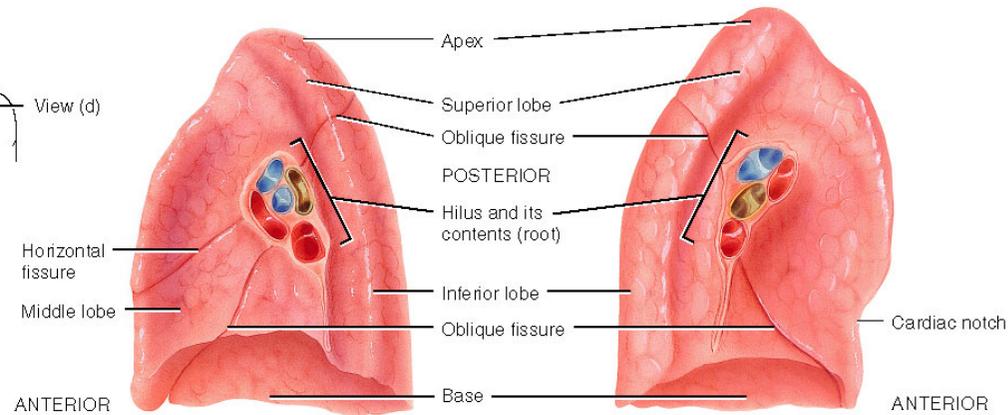
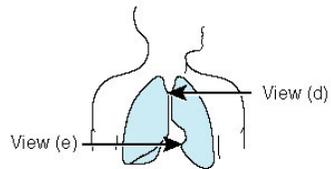


(a) Anterior view of lungs and pleurae in thorax



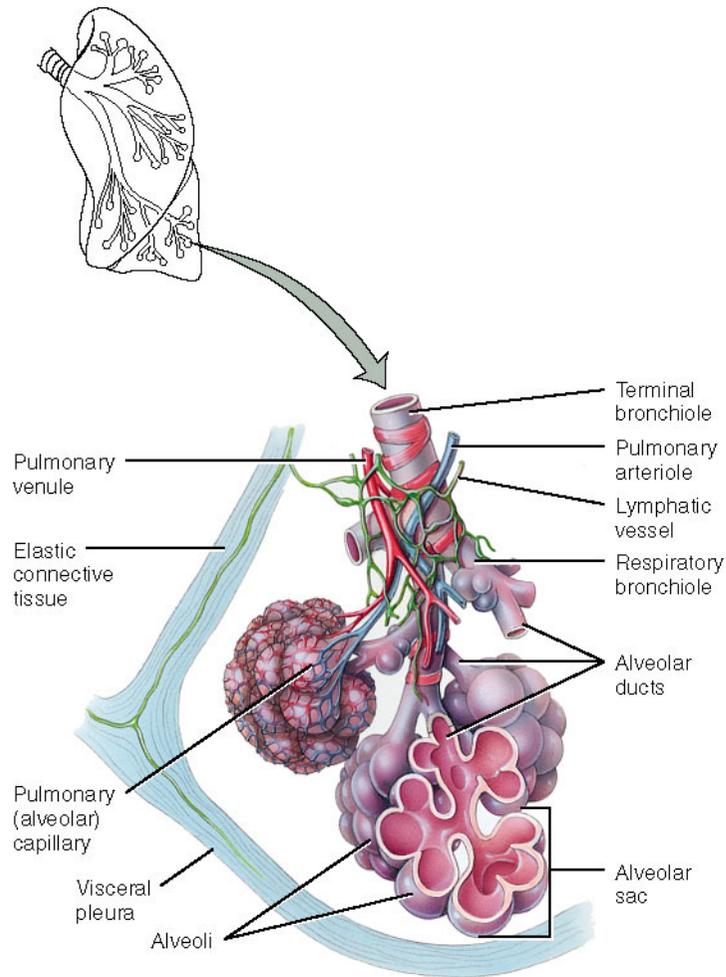
(b) Lateral view of right lung

(c) Lateral view of left lung

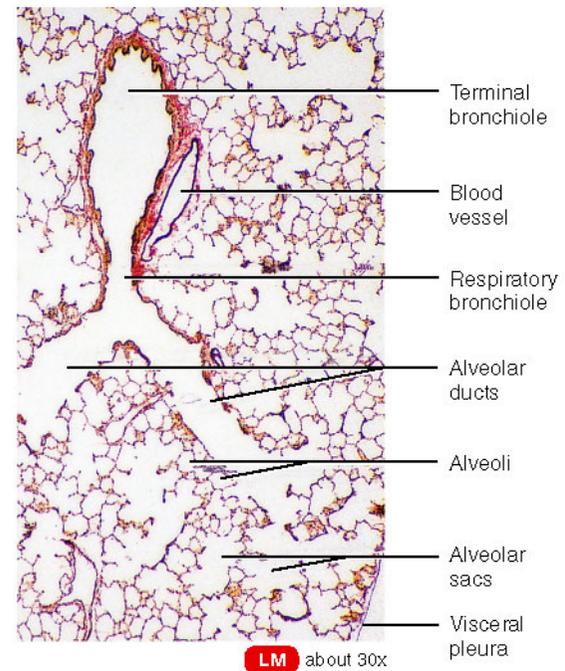


(d) Medial view of right lung

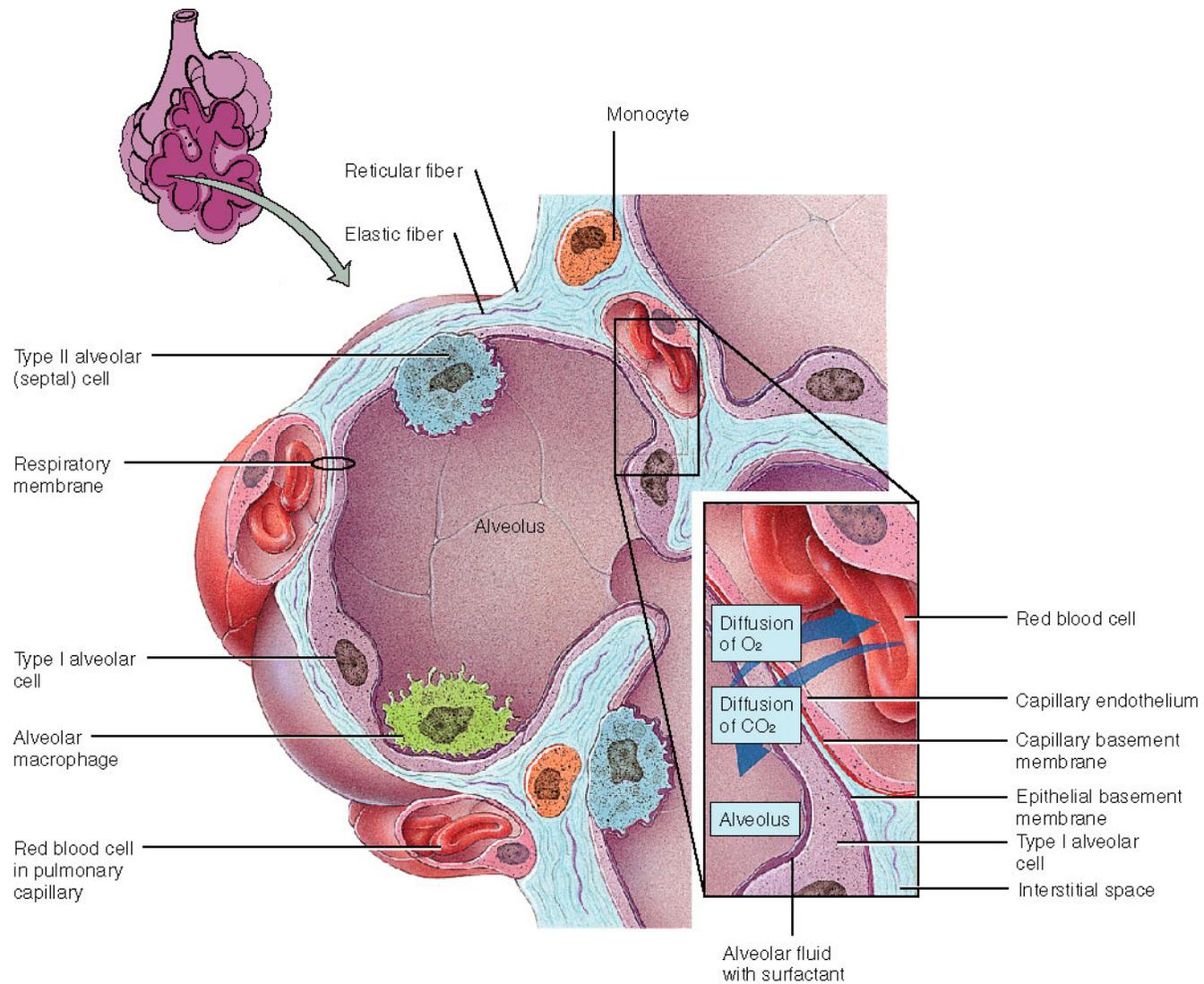
(e) Medial view of left lung



(a) Diagram of a portion of a lobule of the lung

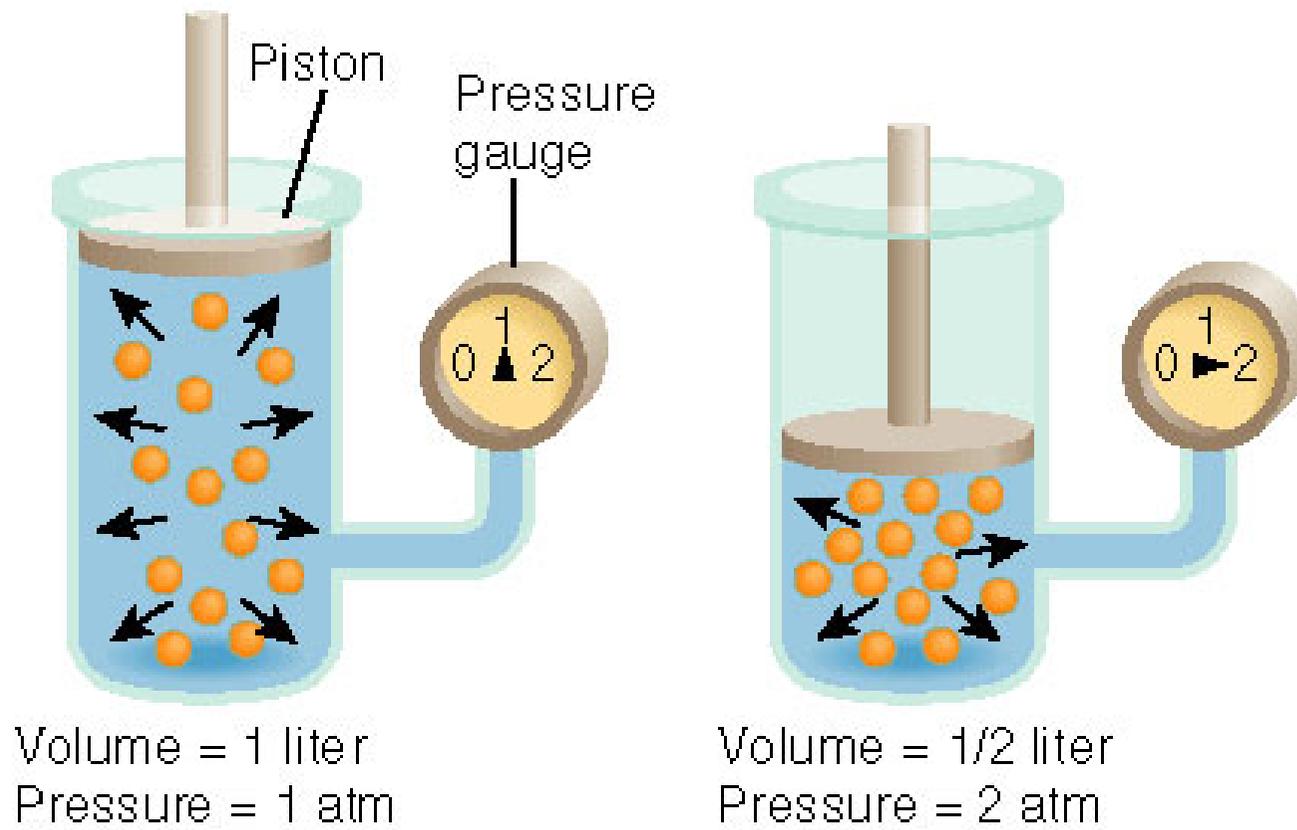


(b) Lung lobule

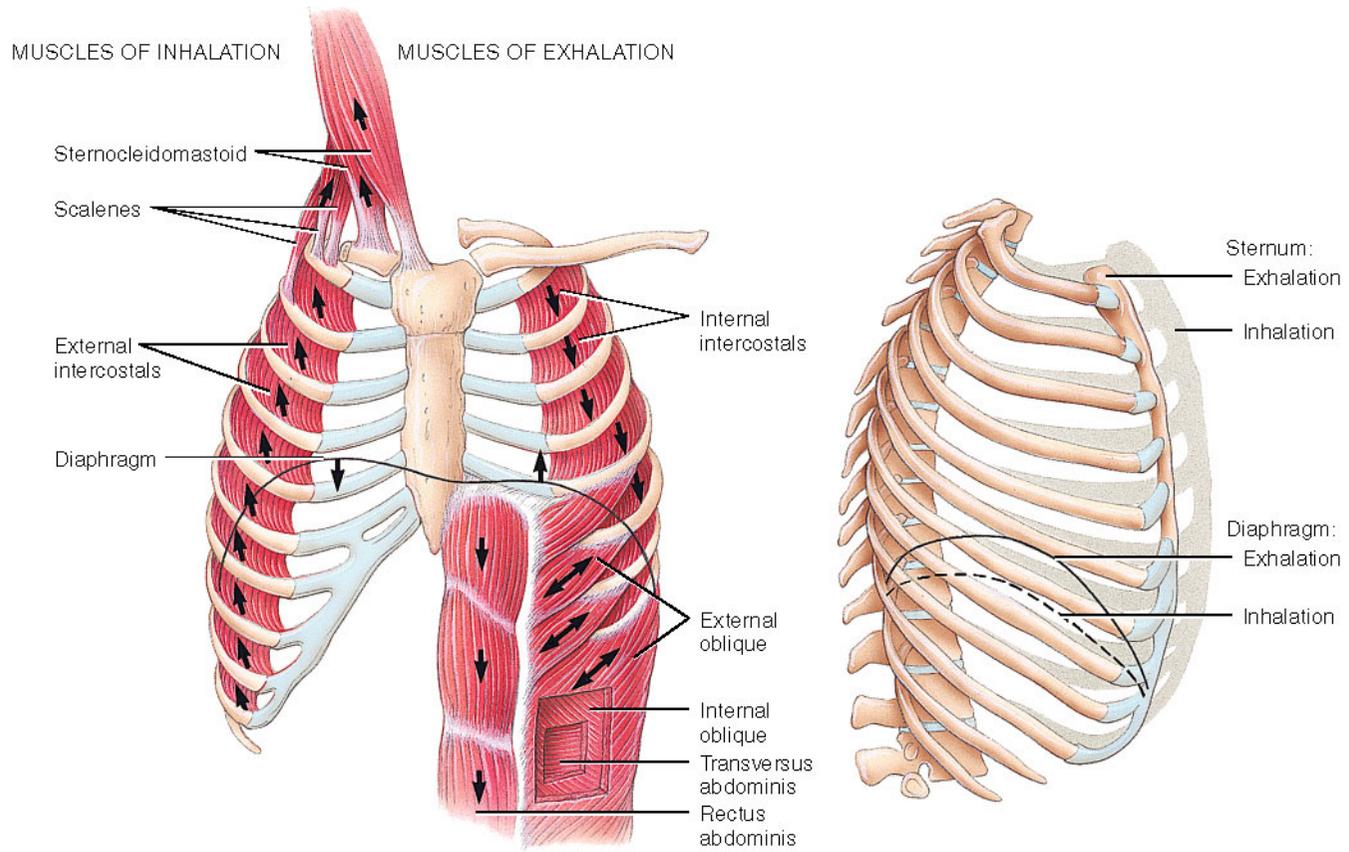


(a) Section through an alveolus showing its cellular components

(b) Details of respiratory membrane



23.13

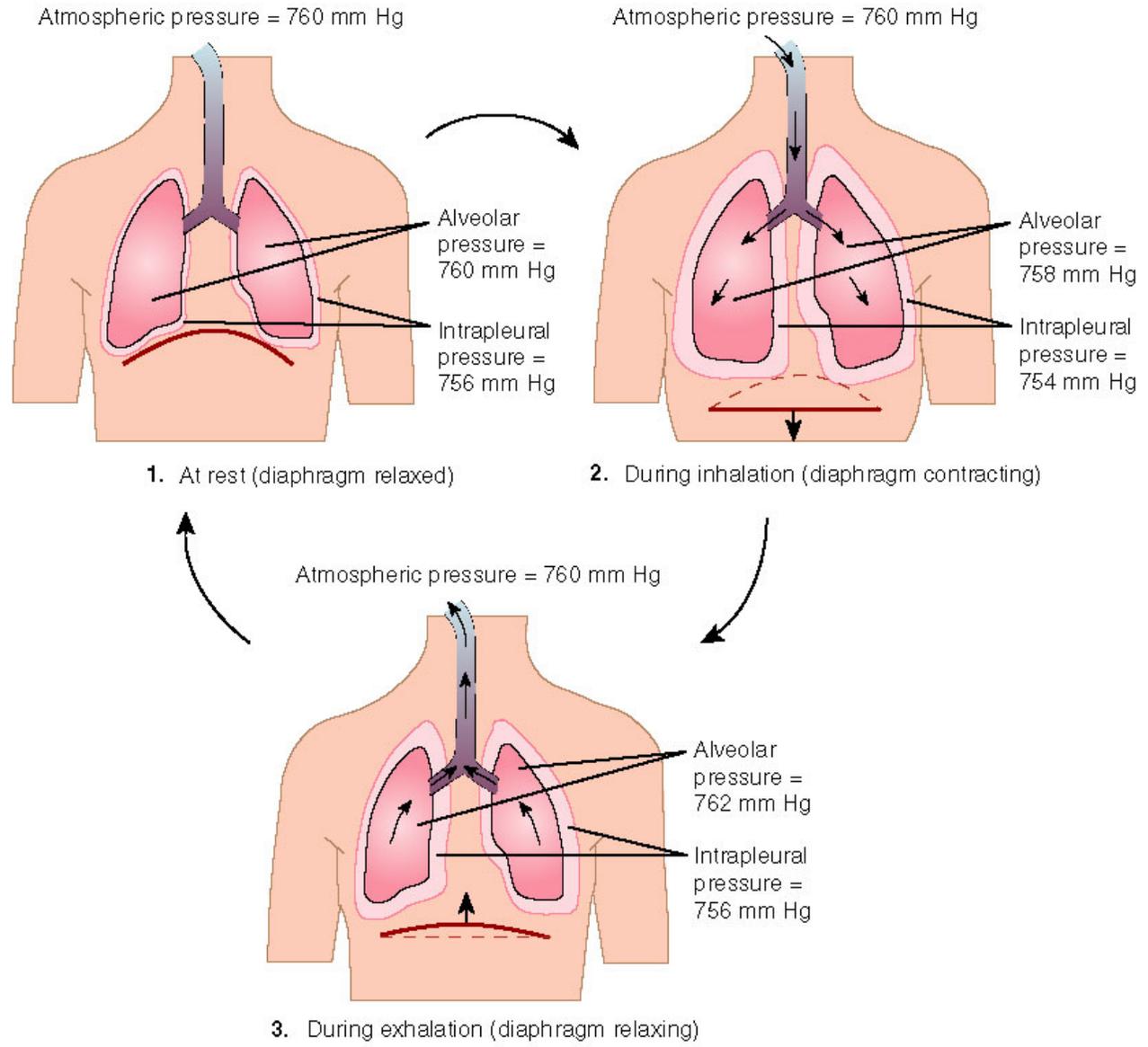


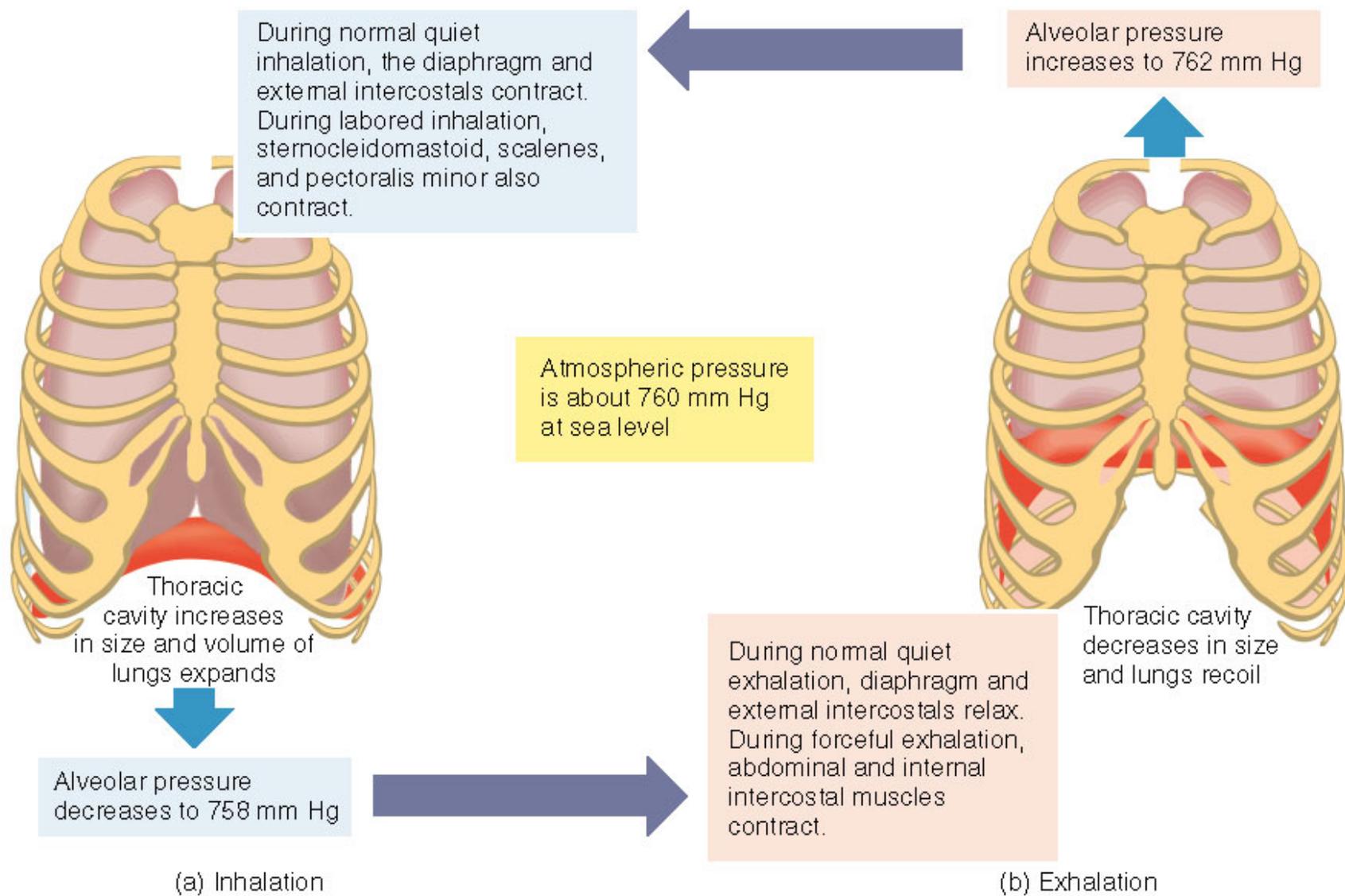
(a) Muscles of inhalation and their actions (left); muscles of exhalation and their actions (right)

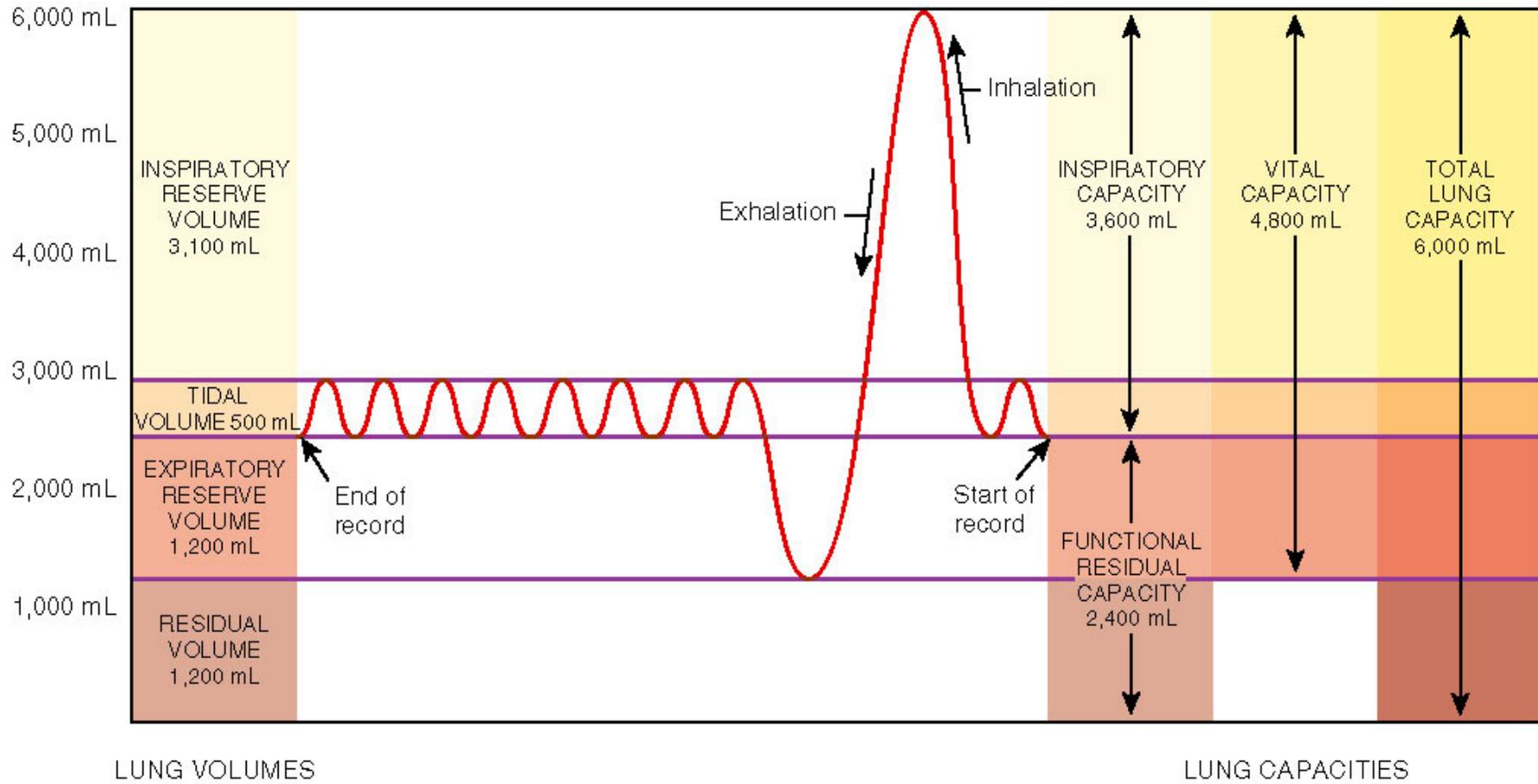
(b) Changes in size of thoracic cavity during inhalation and exhalation

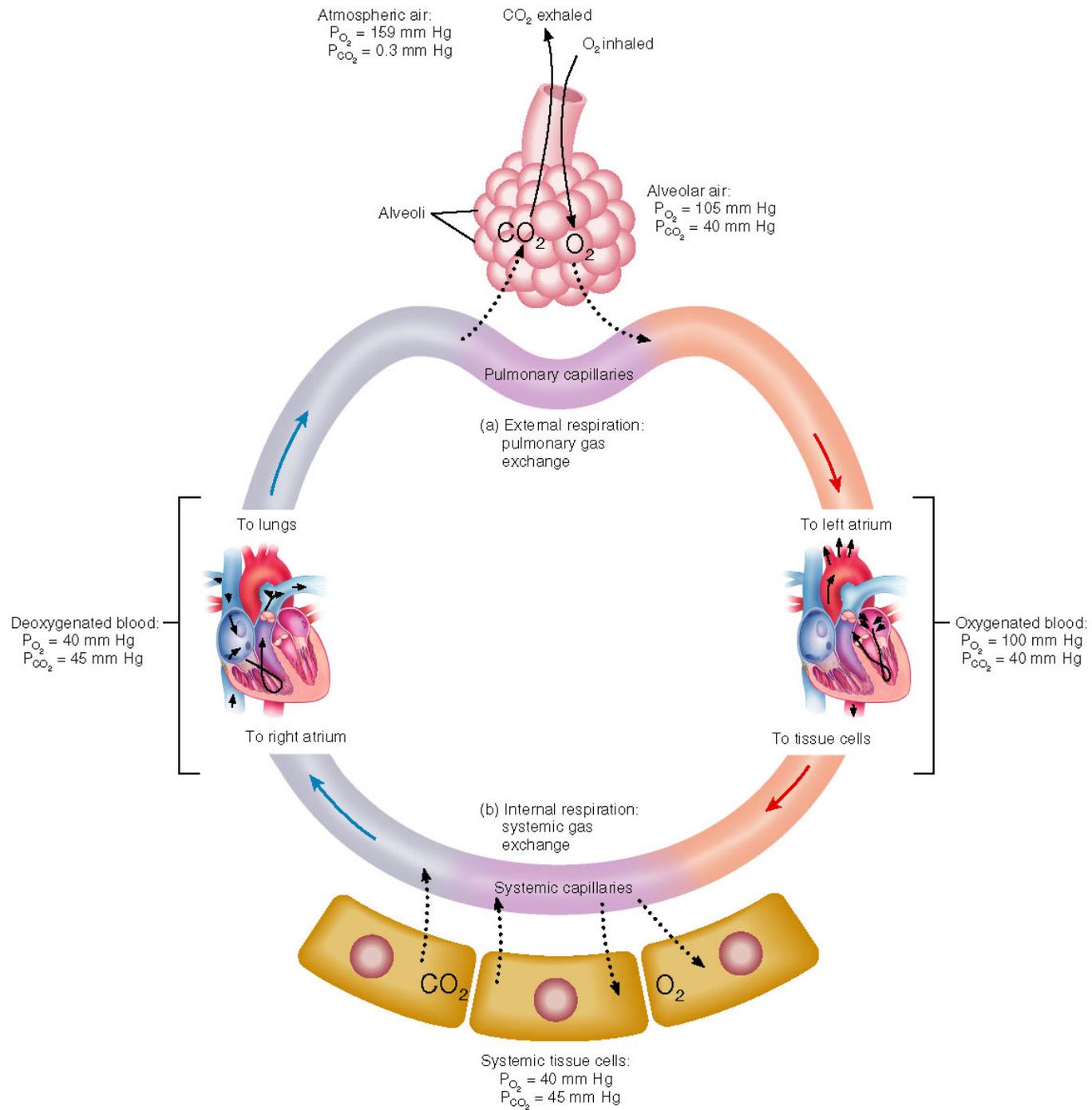


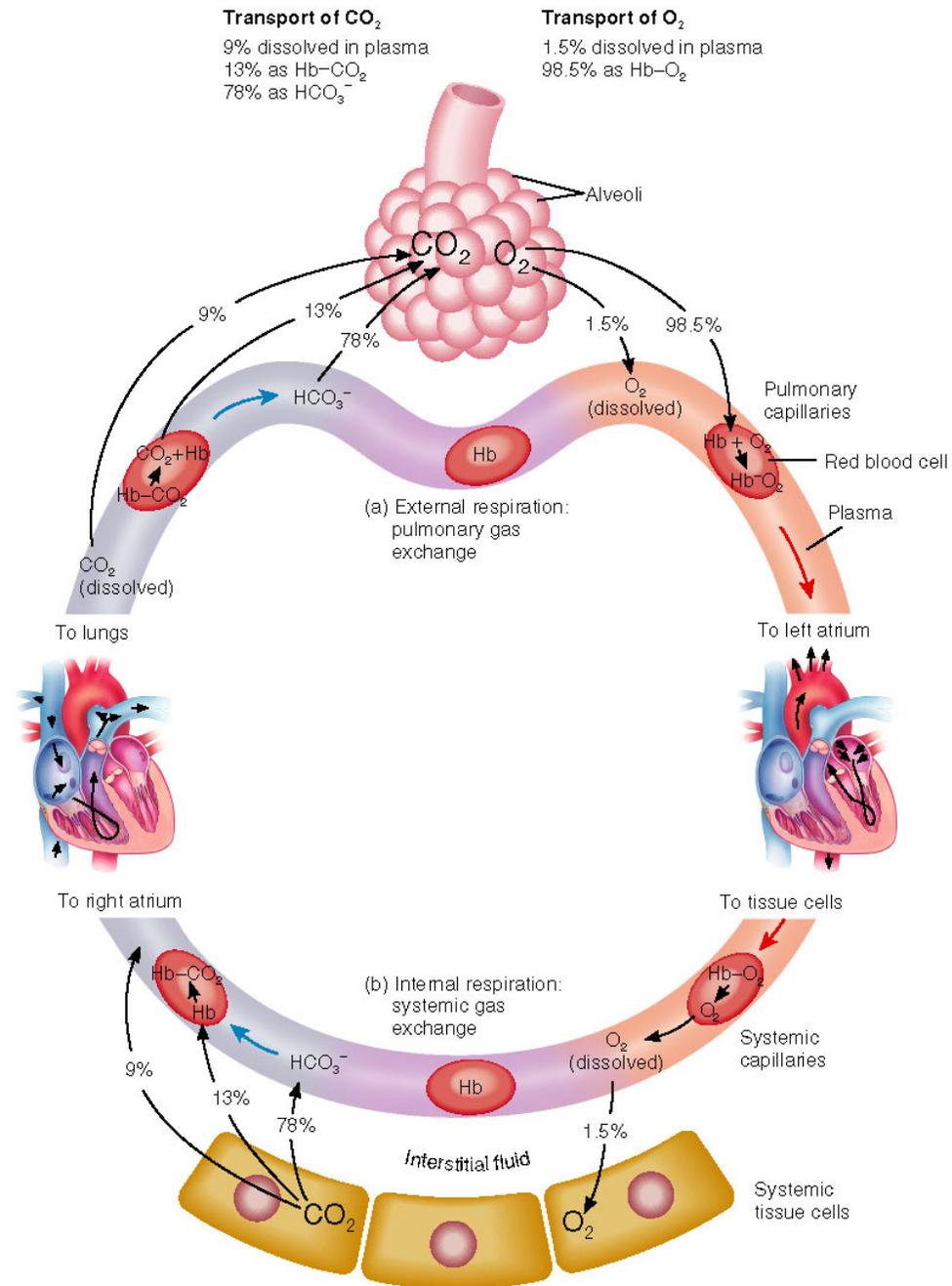
(c) During inhalation, the ribs move upward and outward like the handle on a bucket

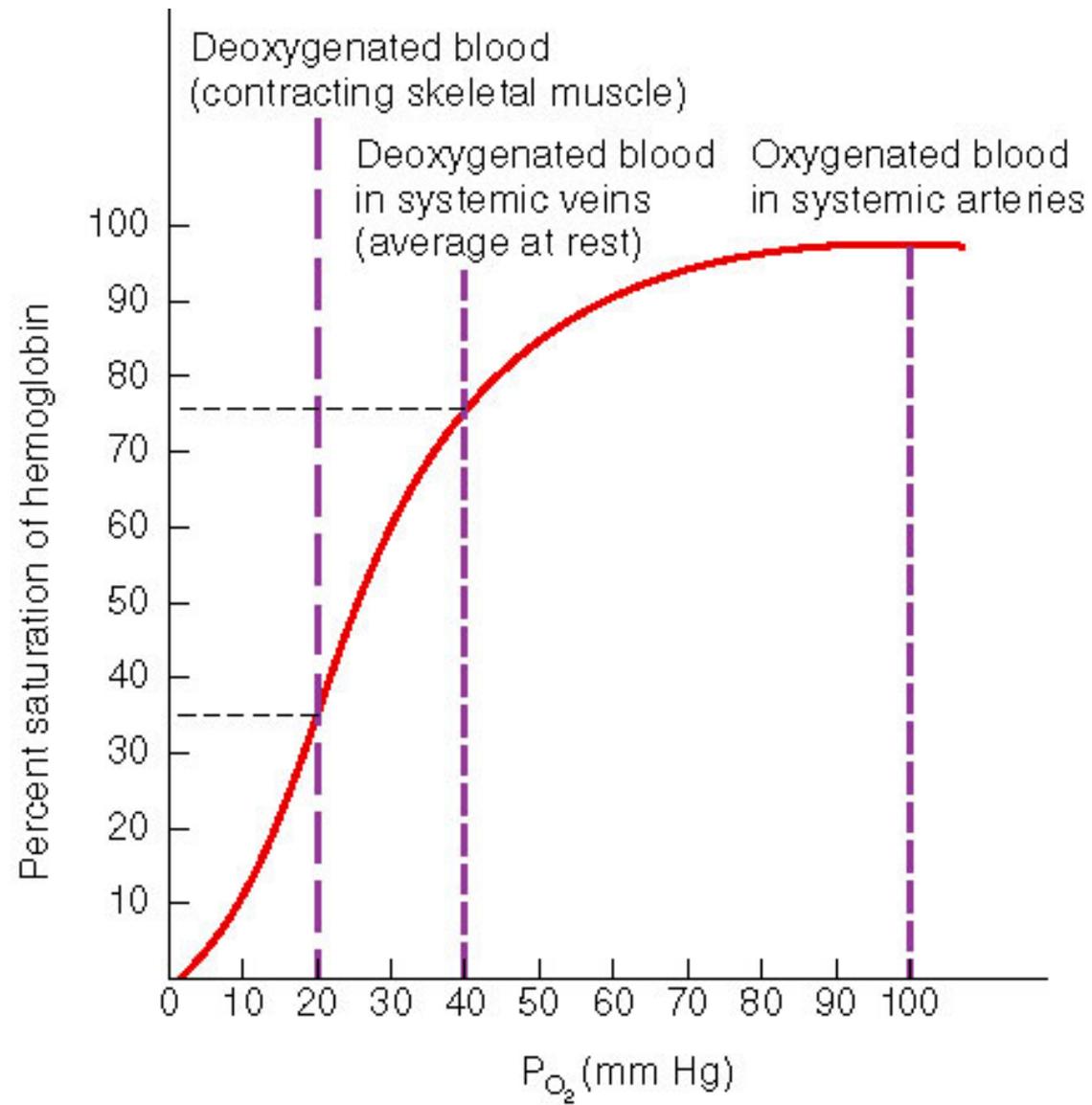




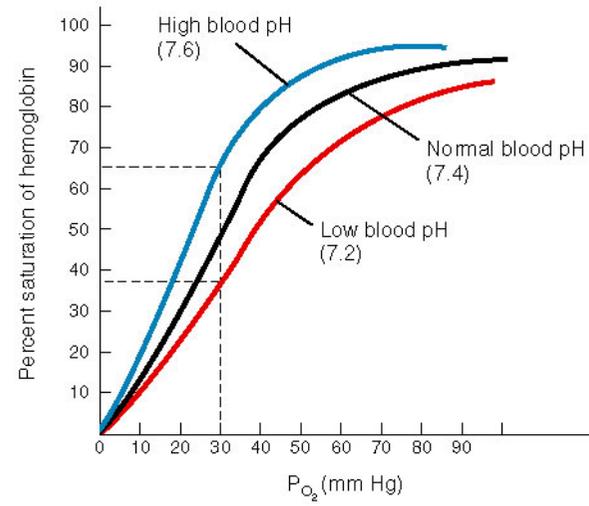




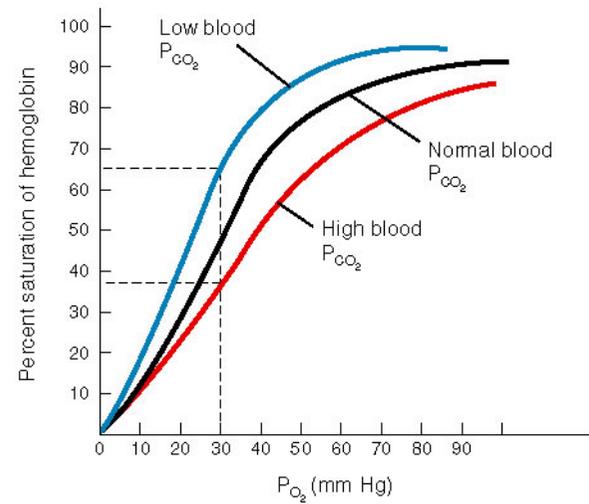




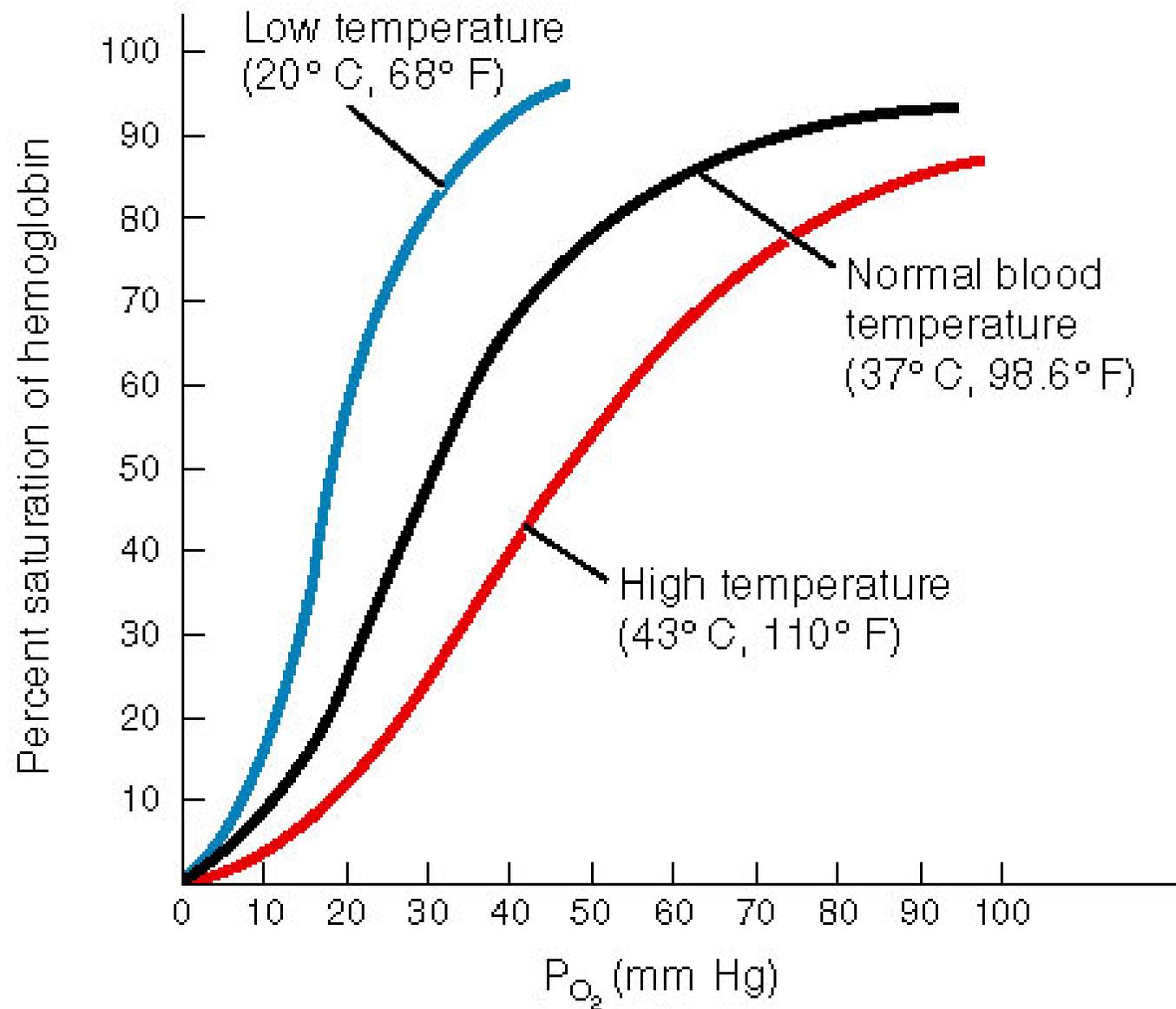
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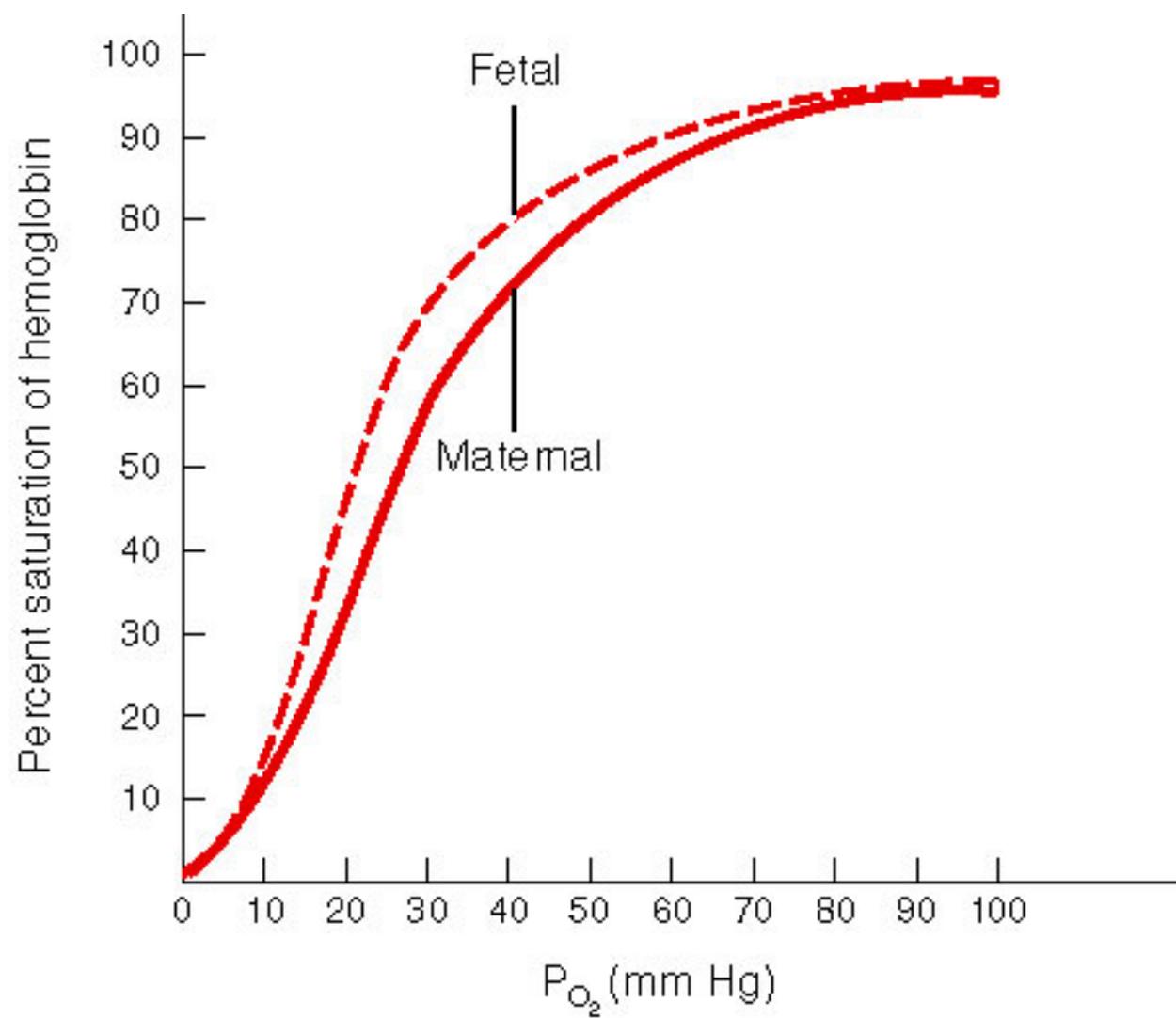


(a) Effect of pH on affinity of hemoglobin for oxygen



(b) Effect of P_{CO_2} on affinity of hemoglobin for oxygen



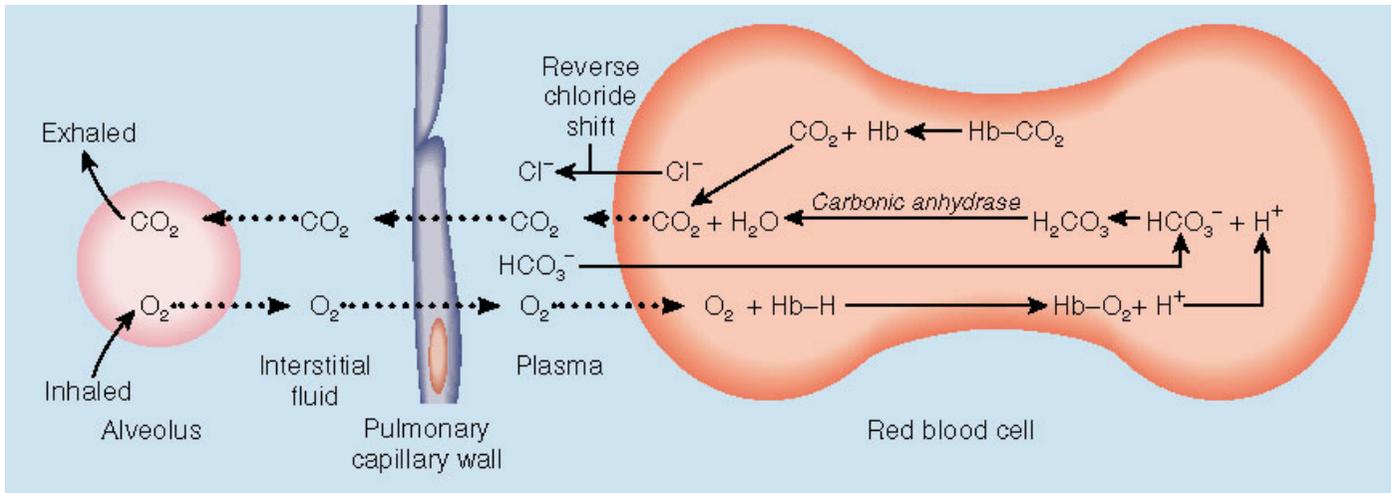


23.23

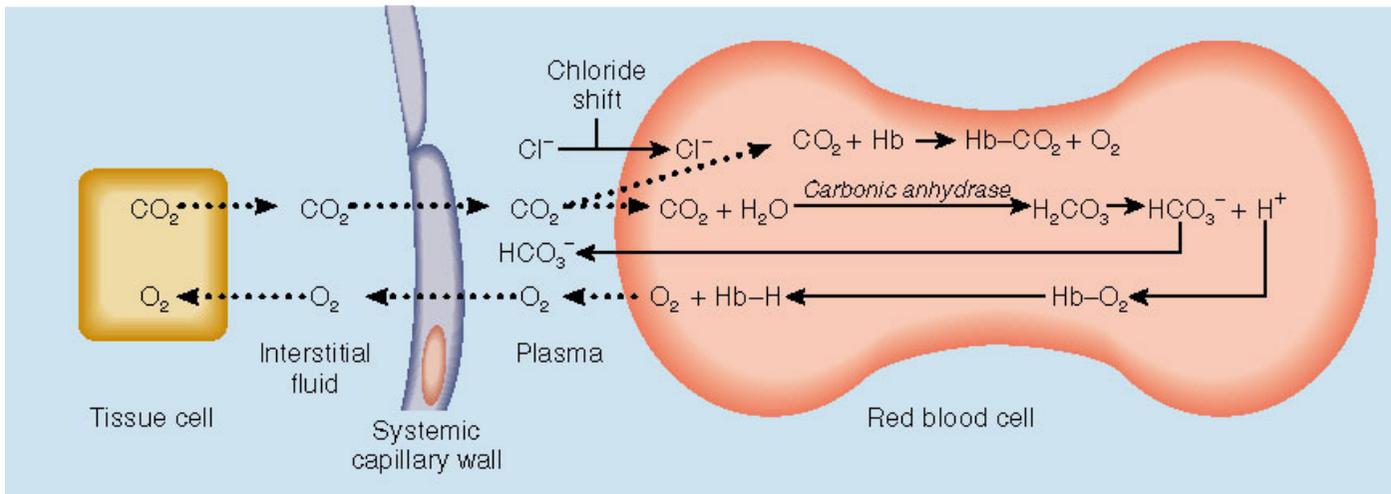
BPG

2,3

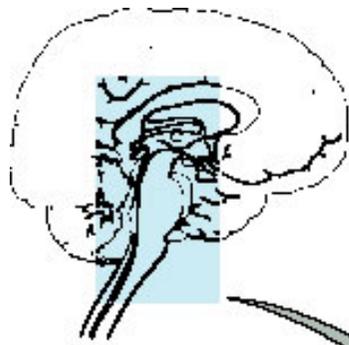
Biphosphoglycerate



(a) Exchange of O_2 and CO_2 in pulmonary capillaries (external respiration)



(b) Exchange of O_2 and CO_2 in systemic capillaries (internal respiration)



RESPIRATORY CENTER:

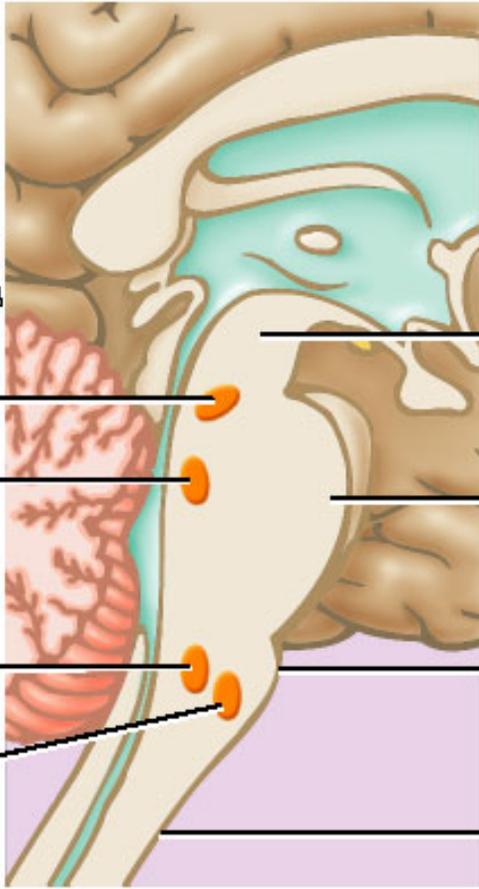
Pneumotaxic area

Apneustic area

Medullary rhythmicity area:

Inspiratory area

Expiratory area



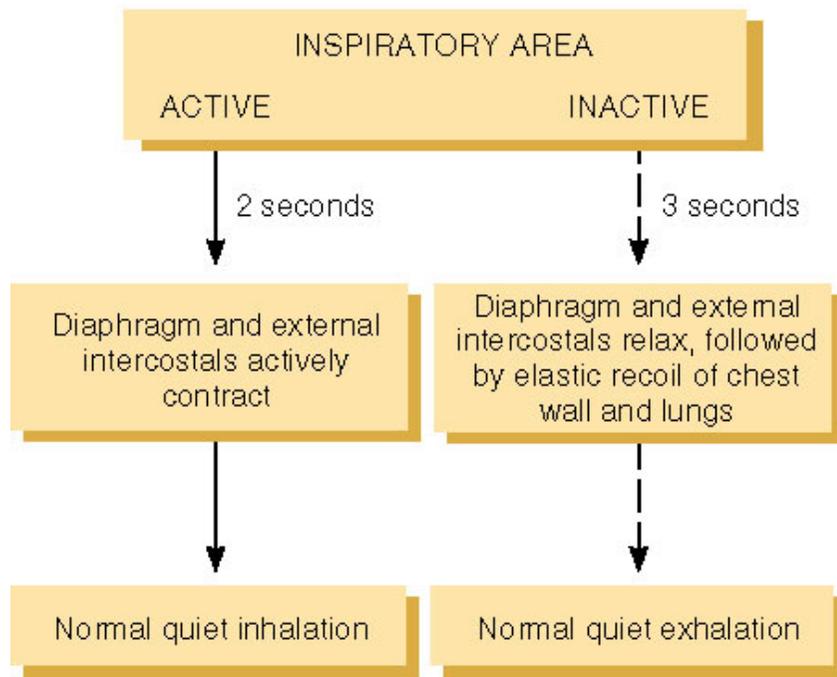
Midbrain

Pons

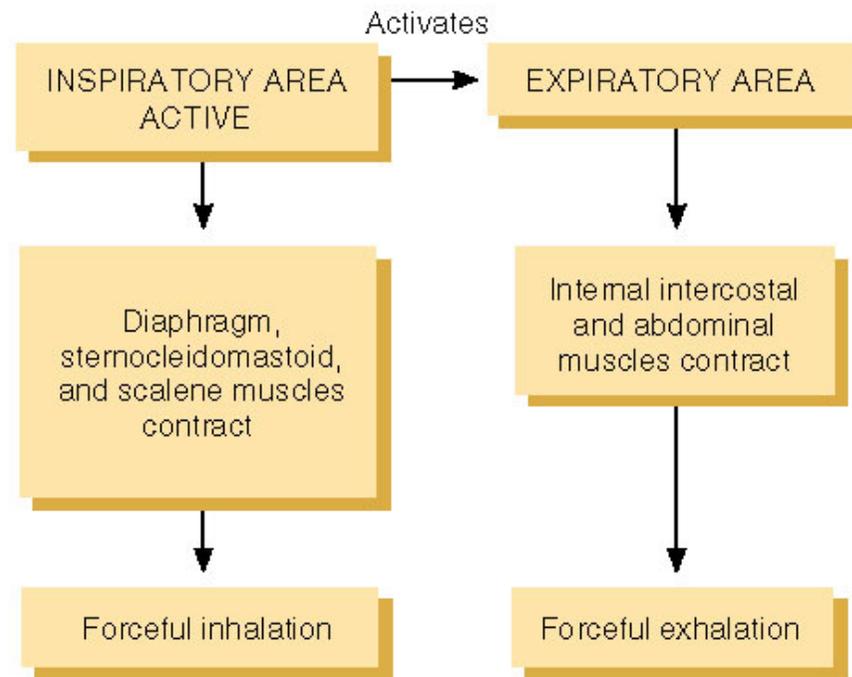
Medulla oblongata

Spinal cord

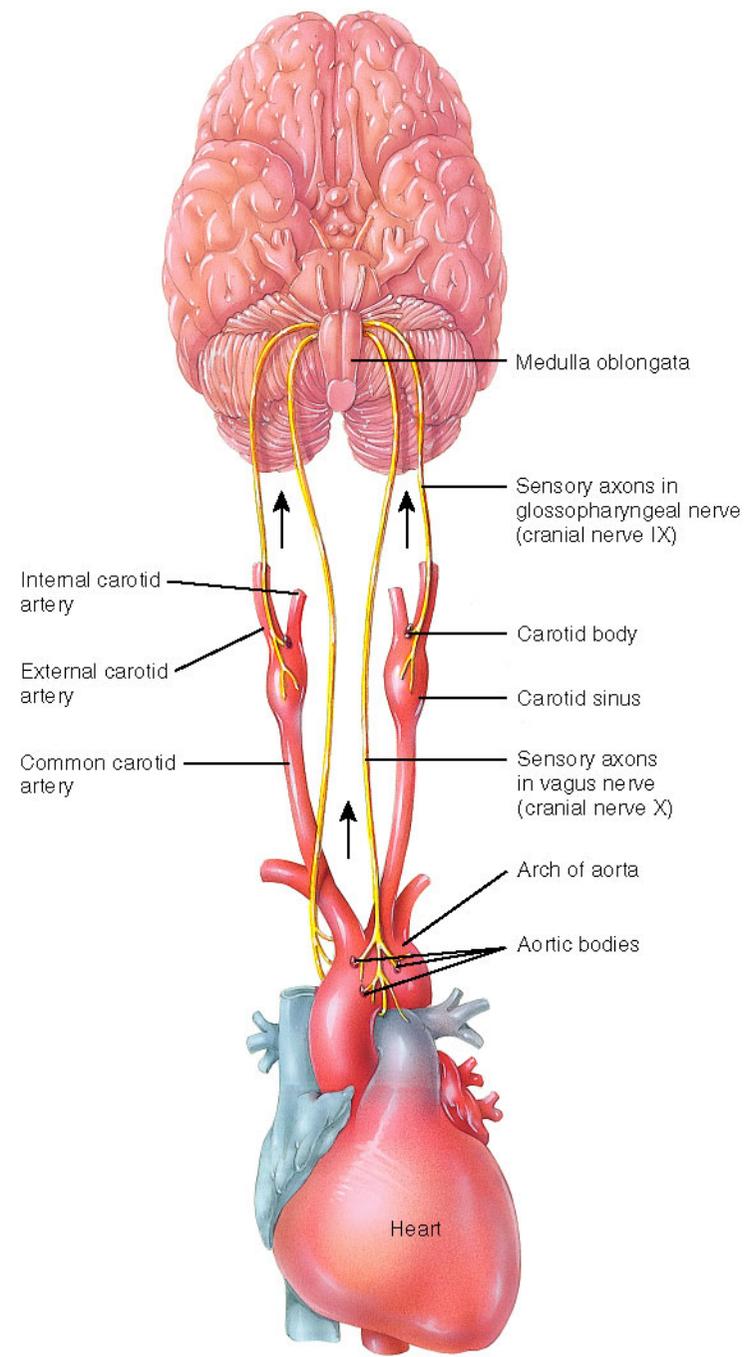
Sagittal section of brain stem

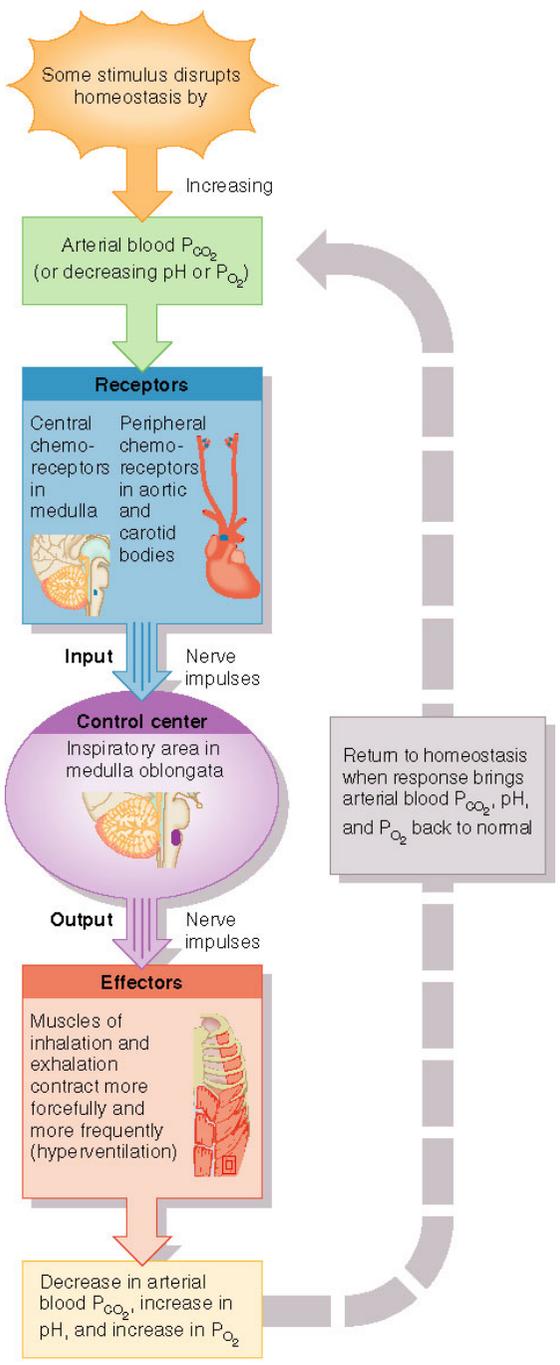


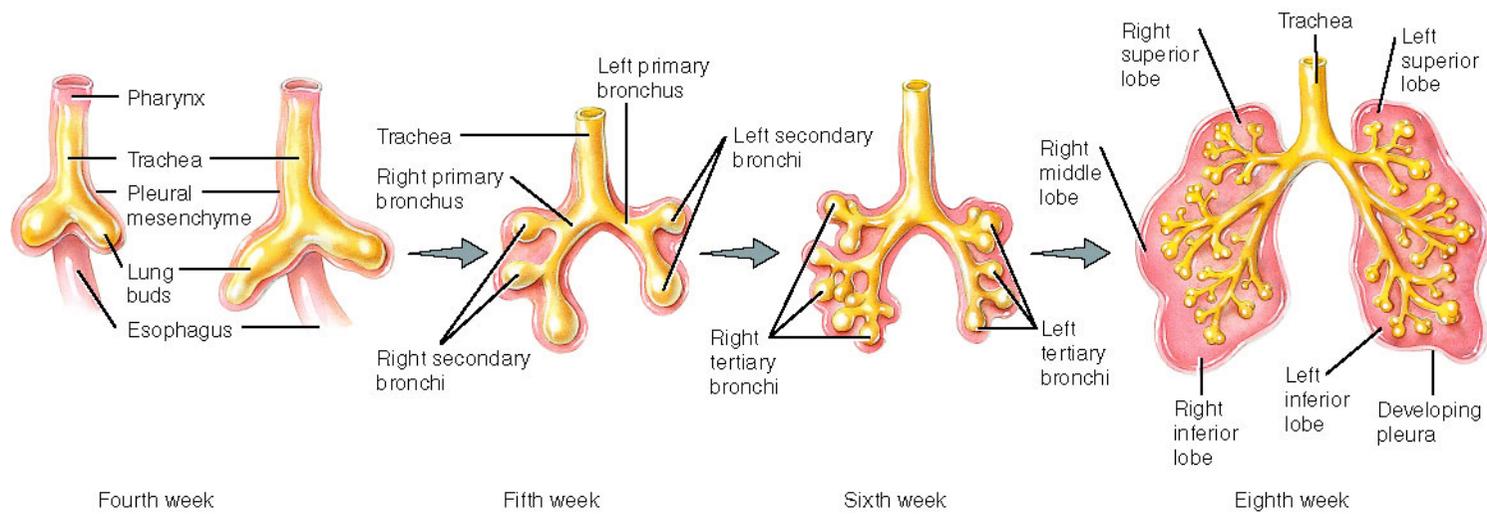
(a) During normal quiet breathing



(b) During forceful breathing







Types of Hypoxia

- Anemic
- Hypoxic
- Ischemic
- Histotoxic
- Hypoxemic

Lung Diseases

- COPD = Chronic Obstructive Pulmonary Disease (Asthma, Bronchitis and Emphysema)
- Tuberculosis
- Lung Cancer
- Pneumonia
- Pulmonary edema

Words to Learn

- Apnea, Dyspnea, Hyperpnea, Orthopnea, Hypercapnea, Tachypnea, eupnea
- Haldane Effect
- Aspiration
- Bronchoscopy
- Cheyne-Stokes breathing
- Pulmonary embolism
- SIDS
- Asphyxia
- Rales
- Compliance