心臟應用解剖學

Applied Cardiac Anatomy

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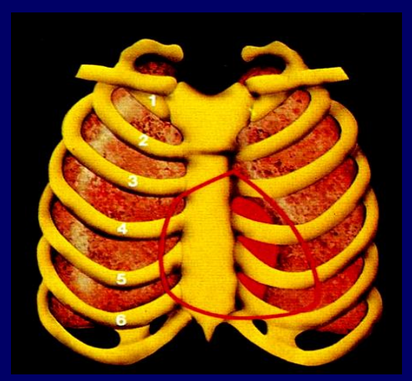

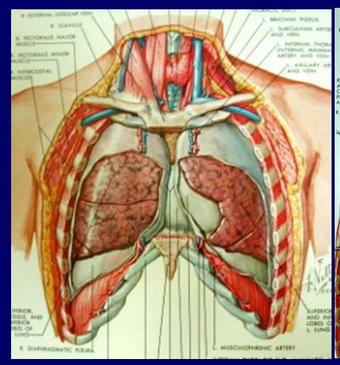

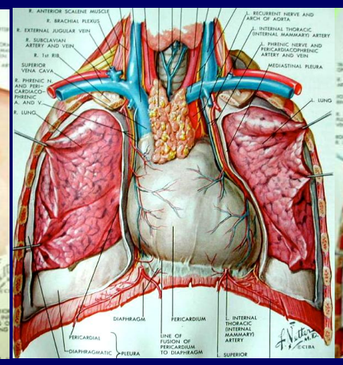

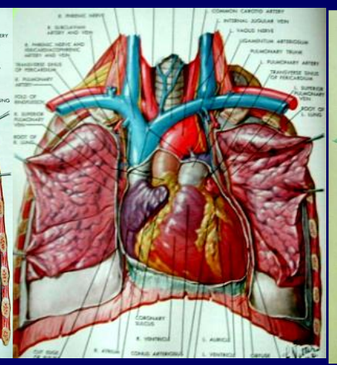

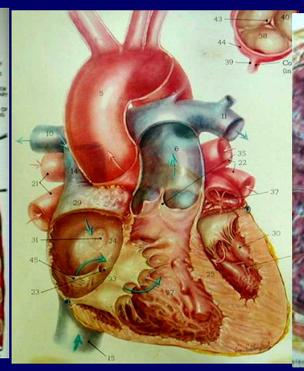

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Applied Anatomy and Physiology of Respiratory System

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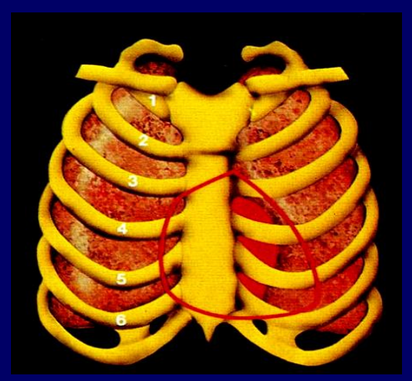
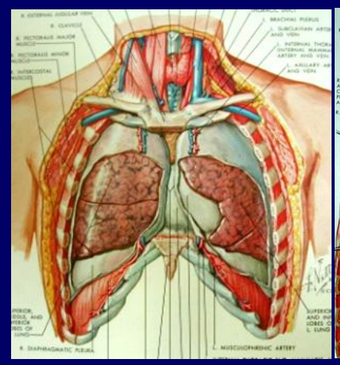
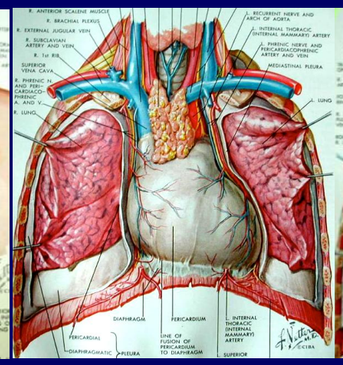
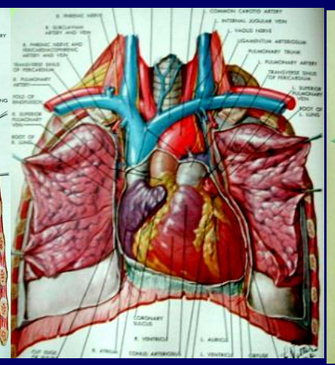
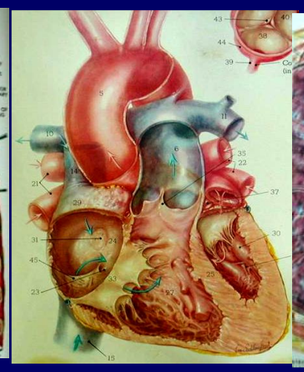


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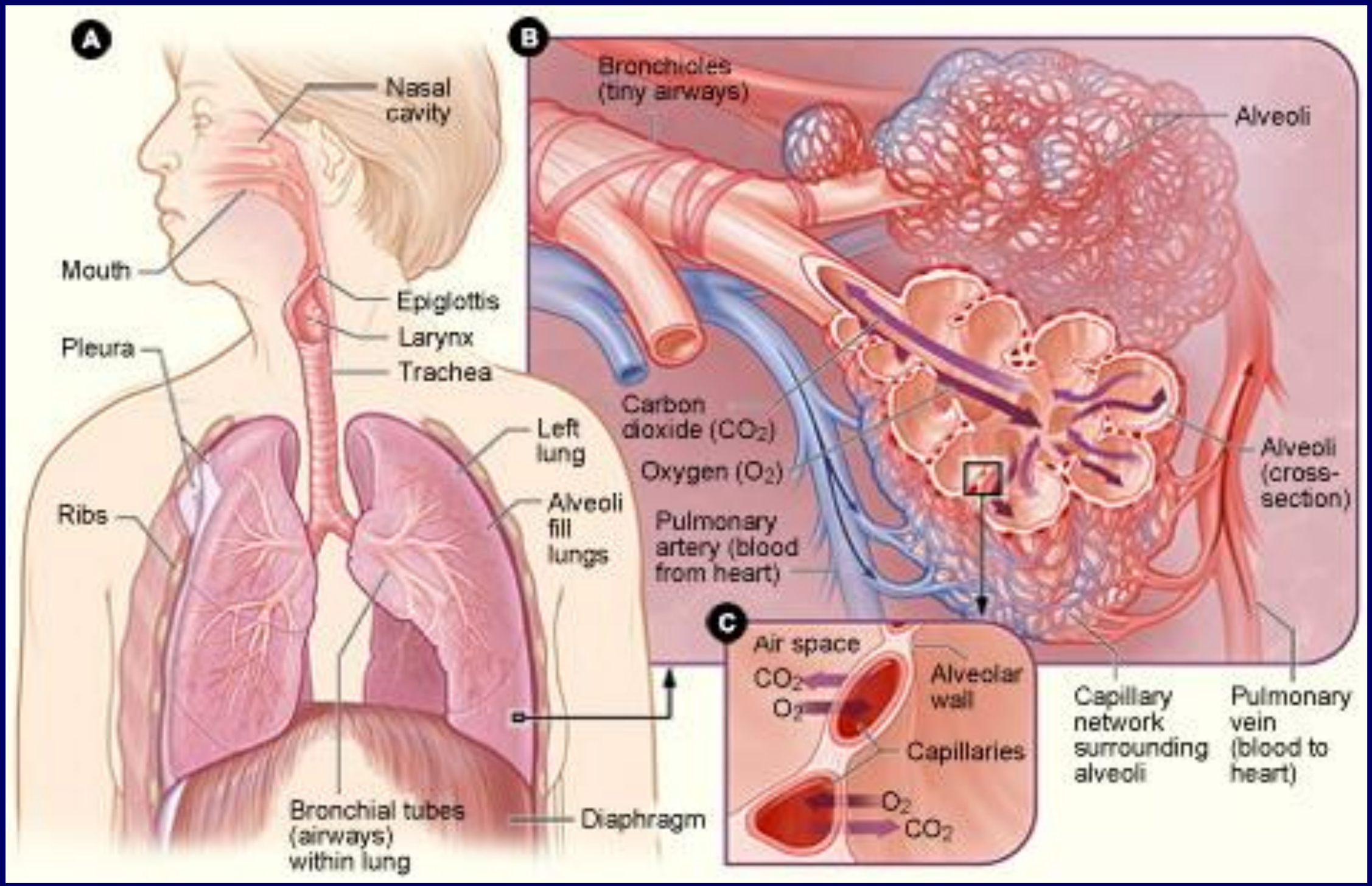
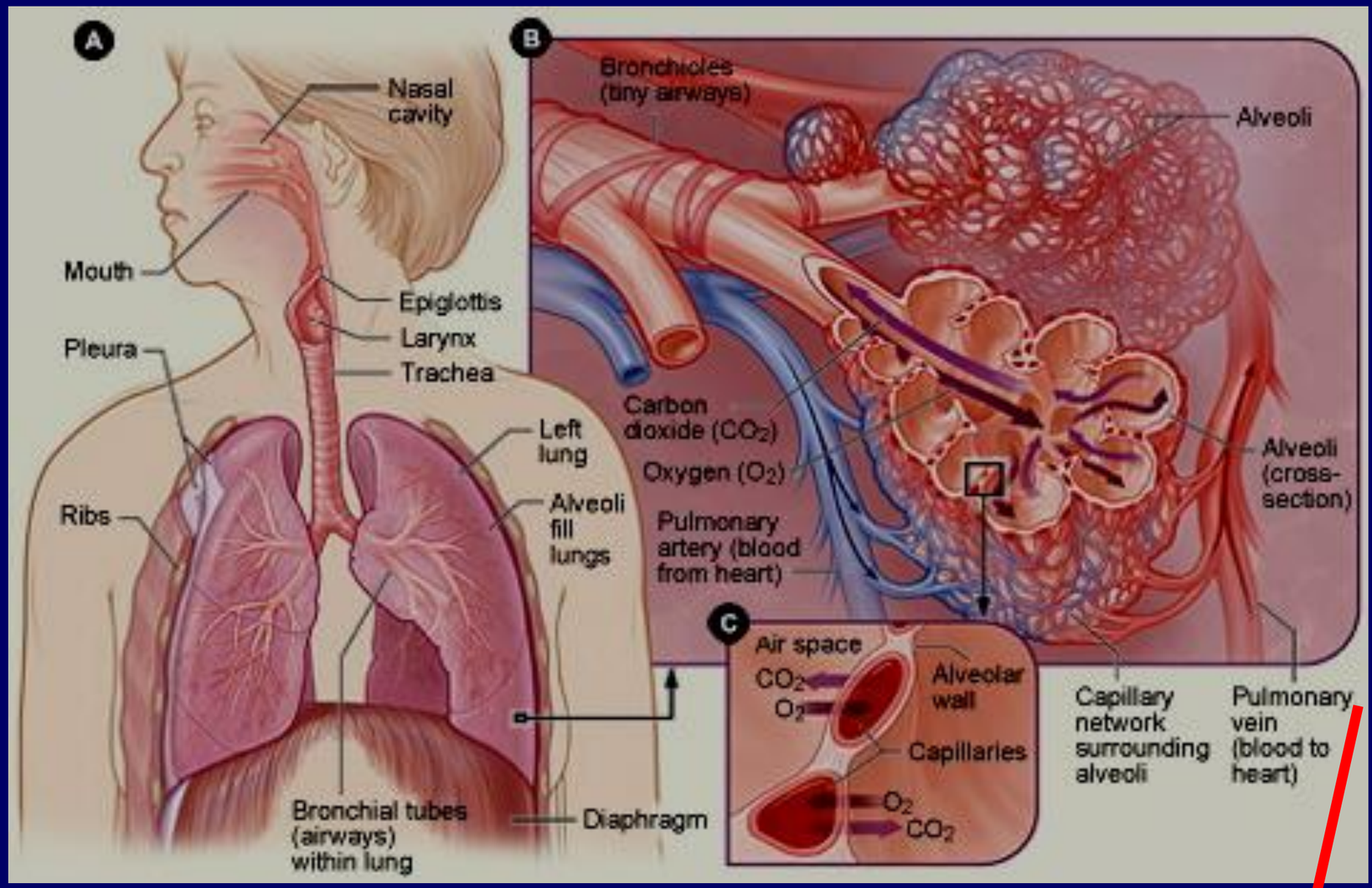
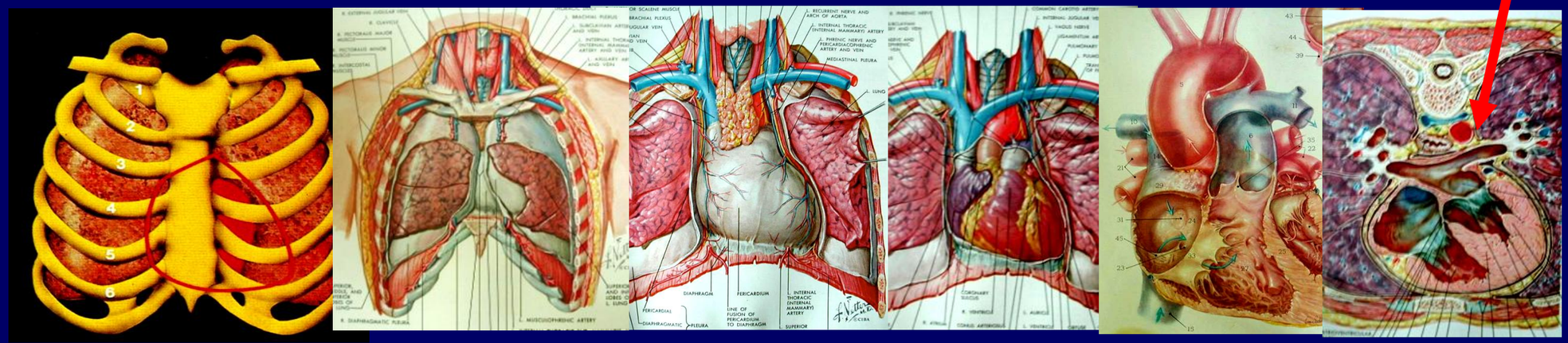

A
Nasal cavity
Mouth
Epiglottis
Larynx
Pleura
Trachea
Left lung
Ribs
Alveoli fill lungs
Bronchial tubes (airways) within lung
Diaphragm
B
Bronchioles (tiny airways)
Alveoli
Carbon dioxide (CO_2)
Oxygen (O_2)
Alveoli (cross-section)
Pulmonary artery (blood from heart)
C
Air space
CO_2
O_2
Alveolar wall
Capillaries
O_2
CO_2
Capillary network surrounding alveoli
Pulmonary vein (blood to heart)

Anatomy of Respiratory System



Pulmonsry eins



Left Atrium

Gross Anatomy of Respiratory System
“Computer controlled respiratory machinery”

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Anatomy of Respiratory System
Computer controlled respiratory machinery

Ventilation

Central control system

Respiratory centers

Cerebral cortex

Nerves (wires)

Neuromuscular junction

(socket)

Respiratory apparatus

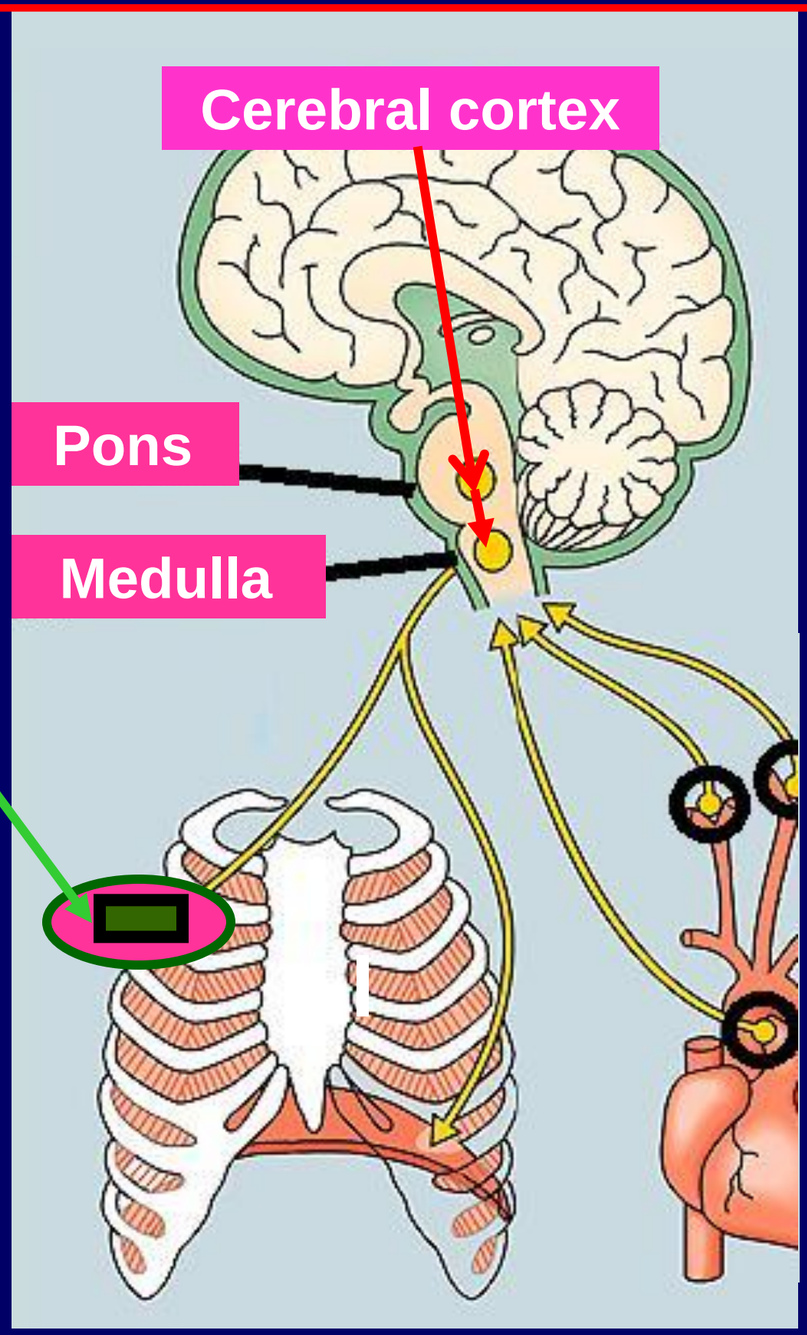
(hardwares)

Thorax (胸廓)

Pleural cavity

Lungs parenchyma

Airways



Perfusion

Vessels (pulmonary and bronchial arteries)

0

Central Regulation of Breathing
(rate, depth and rhythm)

Respiratory Centers

(Control rate, depth/rhythm)

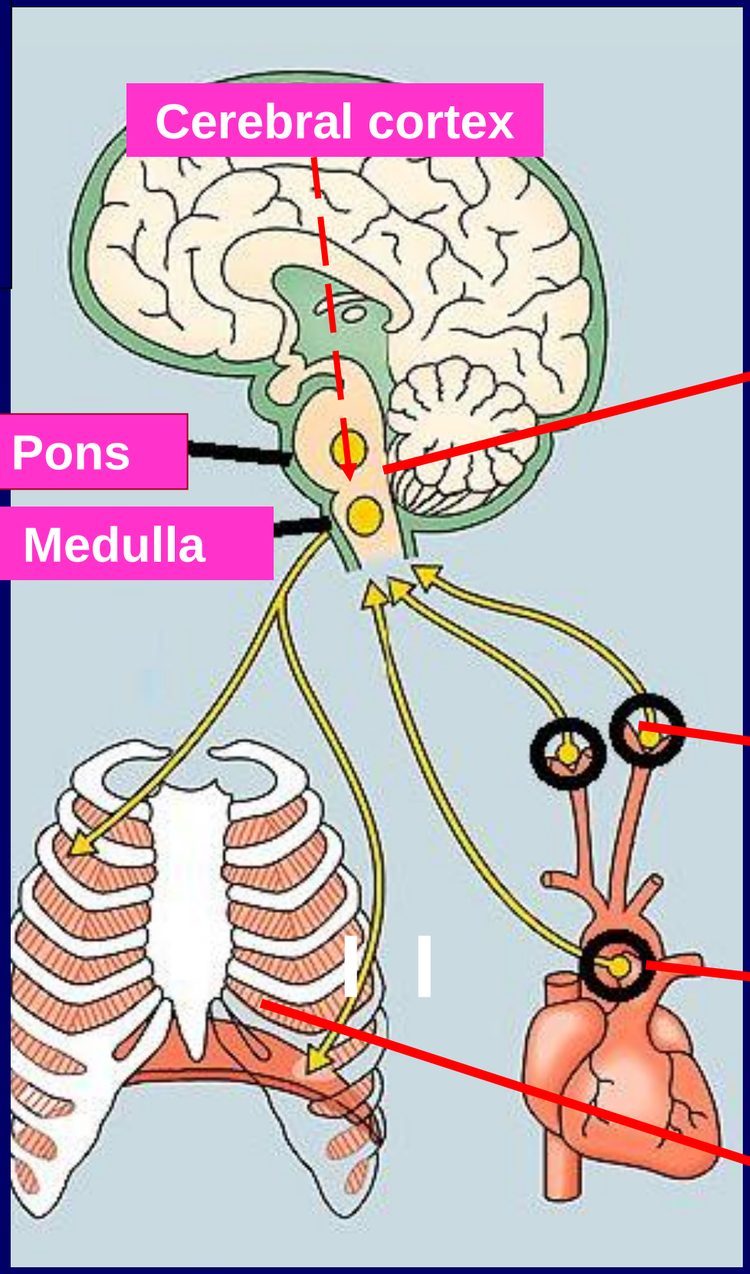
Pons

upper pons –
pneumotaxic center
inhibits inspiration/
control rate

lower pons –
apneustic center

Medulla – rhythm control

(Cerebral cortex)



Feedback systems

Chemical sensors

1) **Central**

Medulla

dosal nuclenus

H^+ sensor

2) **Peripheral**

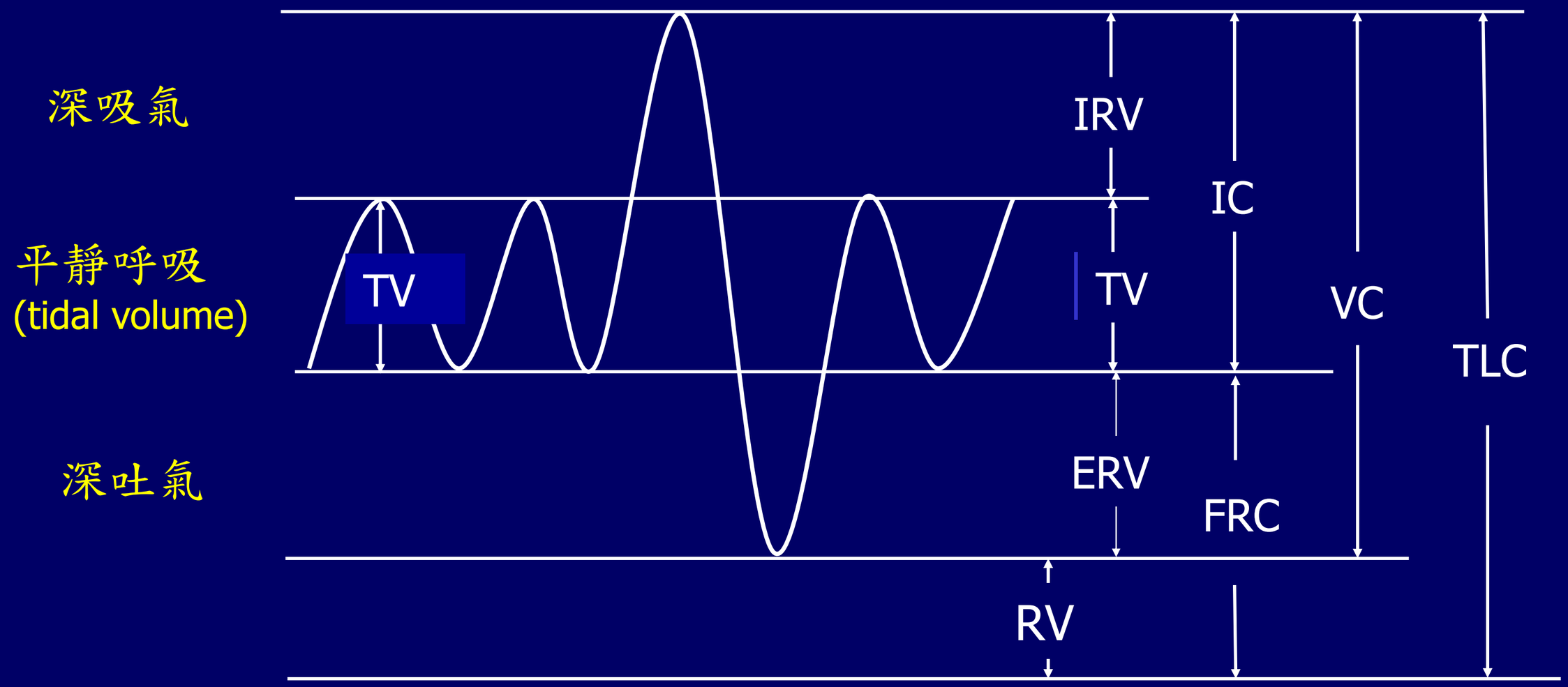
Chemoreceptors

Carotid body –
pO2/pCO2 sensors

Aortic body –
pO2 sensor

Stretch receptor

Physical Examination and Lung Volumes



Minute ventilation = tidal volume x respiratory rate/min

ERV: expiratory reserve volume; FRC: functional residual capacity;

IC: inspiratory capacity; IRV: inspiratory reserve volume; RV: residual voulme;

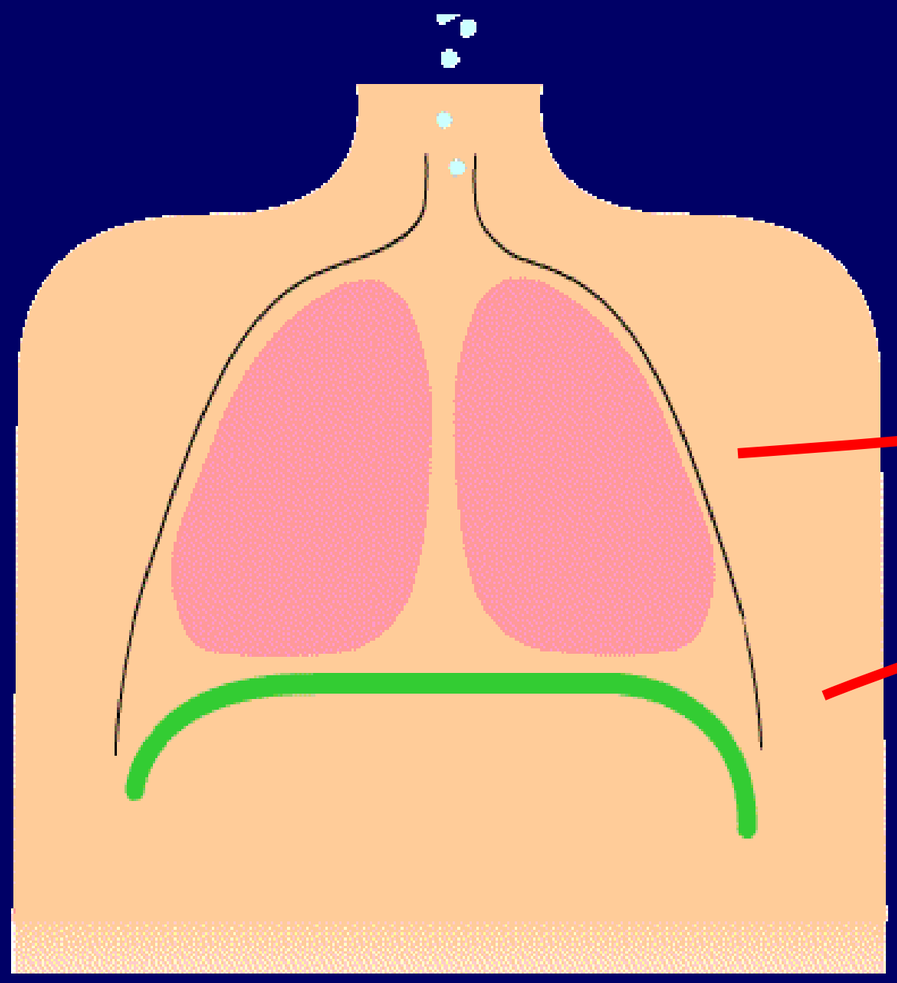
TLC: total lung capacity; TV: tidal volume; VC: vital capacity;

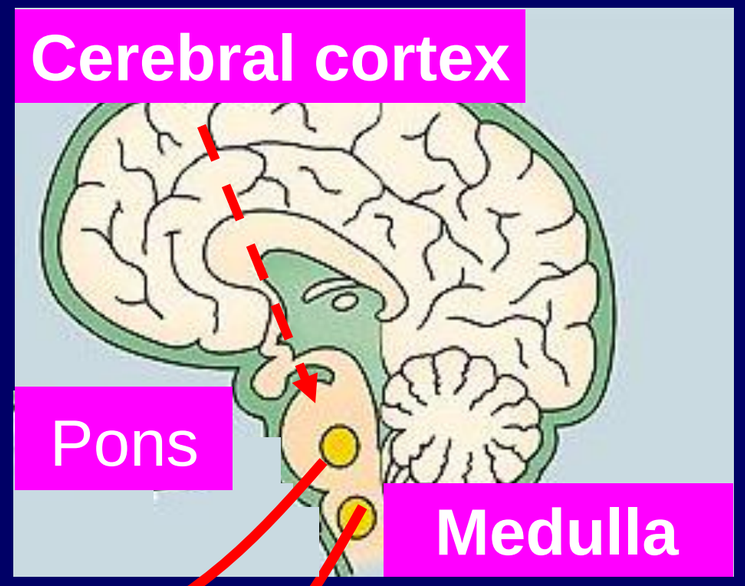
Observation of Breathing

Not only *rate (quantity)*

but also *patterns (quality)*

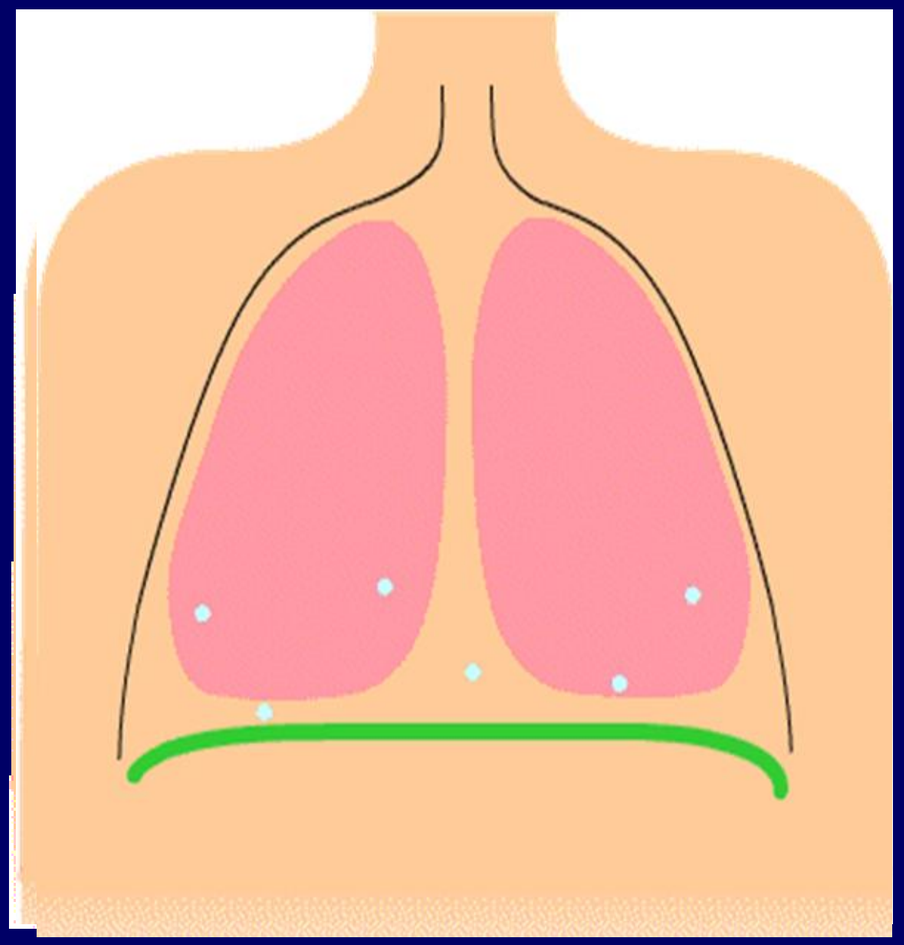
（量、質並重）





Wikimedia 2008

Assessment of Inspiratory Capacity (IC)



Tidal breathing

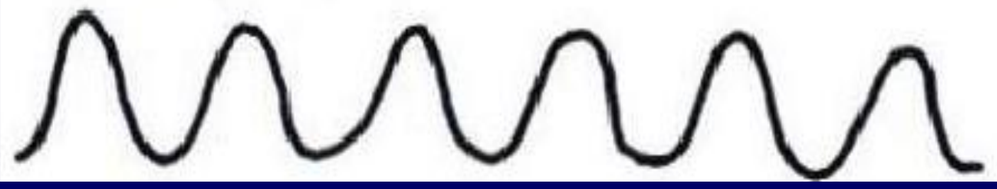
Forced inspiration

End-expiration

Respiratory Patterns

Normal

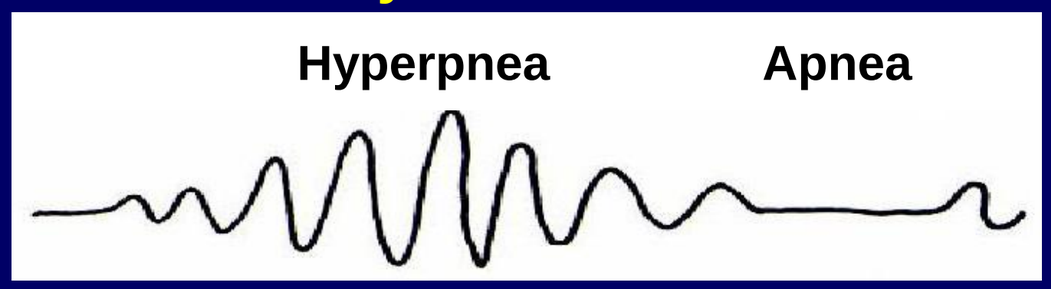
14-18/min in adult I : E = 1 : 1.5 ~ 2



Ataxic Breathing (Biot's breathing)

Sighing Respiration

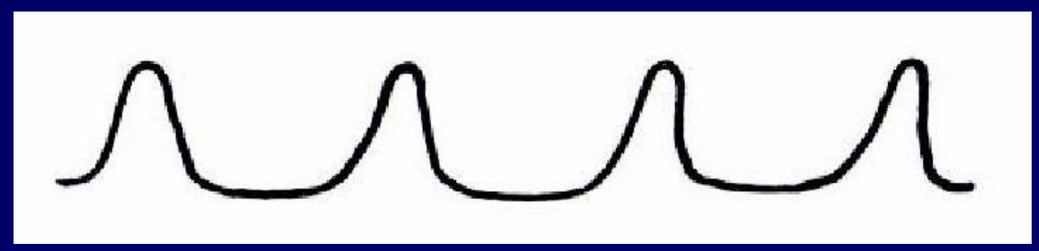
Cheyne-Stokes



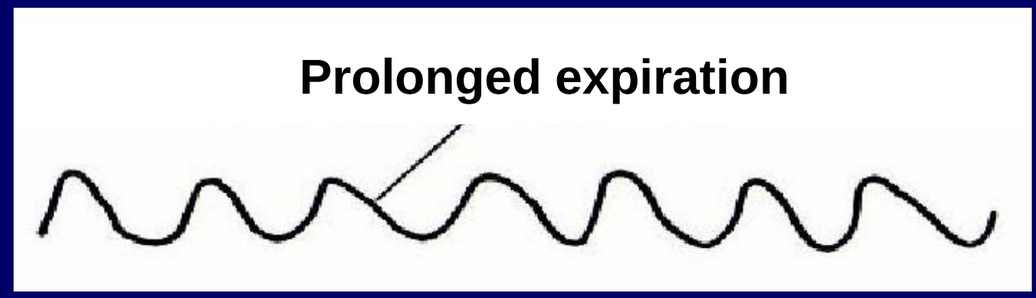
Medulla

Pons

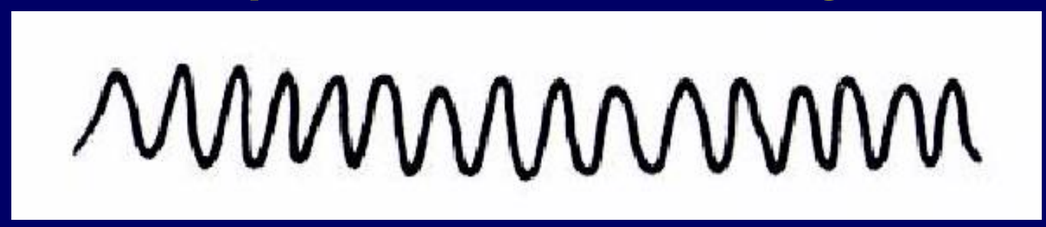
Slow breathing (Bradypnea)



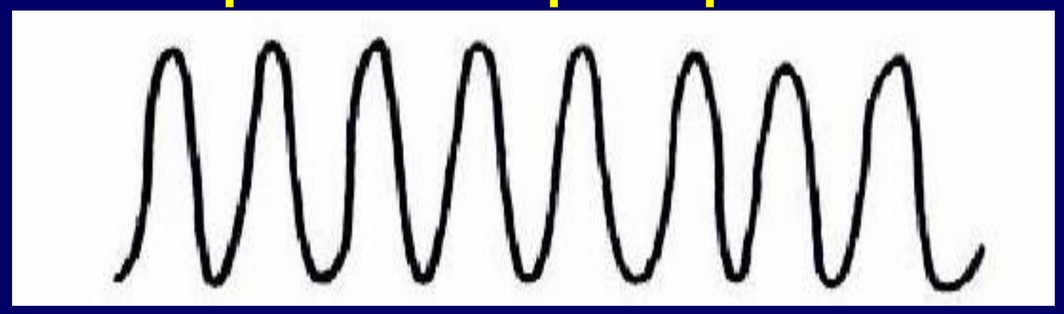
Obstructive Breathing



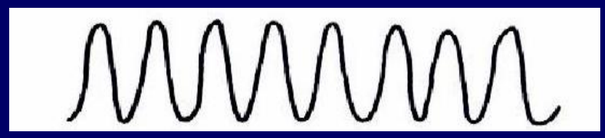
Rapid Shallow Breathing



Rapid and Deep Respiration



Hyperventilaion Syndrome (differential diagnoses)

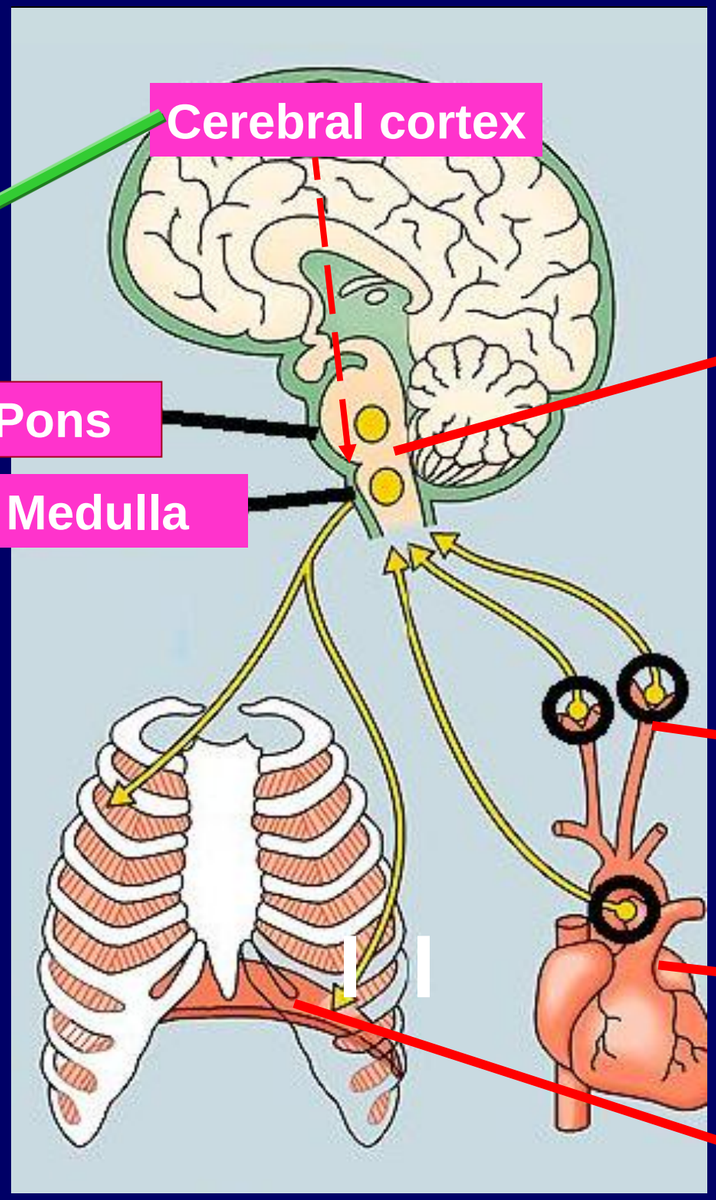


Rapid and Deep Respiration (Kussmaul Respiraion)

1) Psychogenic
e.g.panic
disorder

Symptoms
Paresthesia
Digiatal
Circumoral
Dizziness

Signs
Carpal spasm
Chevostek sign



Feedback systems

Chemical sensors

Central (pons)
H^+ sensor

2) Metabolic acidosis

Peripheral
Chemoreceptors
Carotid body –
pO2/pCO2 sensors

Aortic body –
pO2 sensor

3) Acute pulm embolism
(V/Q mis-match)
PO_2

Stretch receptor
Thorax