

HUMAN ANATOMY & PHYSIOLOGY-II- BP201T**UNIT: 3****CLASS: 3****TOPIC: REGULATION OF RESPIRATION**

The average respiratory rate in adults is 15-18 times per minute

- Its more un case of children's
- The respiration is regulated by the following ways

Nervous control

Chemical control

NERVOUS CONTROL:

Respiration controlled by two mechanisms: Voluntary control & Autonomic control

Voluntary control: This control centre located in the cerebral cortex. Sends the impulse to the respiratory motor neurons via cortico spinal tracts

Autonomic control: This control center is located in the pons and medulla. Also the pneumotaxic and apneustic centres are also responsible for controlling the respiration

CHEMICAL CONTROL: There are three chemical factors controlling the respiration – Carbon dioxide, Oxygen, pH

- When increase in the CO₂ and pH levels – increases the ventilation – excessive amount of CO₂ is washed out to normalize the level
- When decrease in CO₂ and pH levels – opposite effect – inhibit the activity of the respiratory centre – normalizes
- When decrease in O₂ concentration – increases the ventilation – excessive amount of O₂ enters in to the lungs to normalizes the level

CYCLE OF BREATHING: Average breathing rate is 12 – 15 per min

Each breath has 3 phases

Inspiration – lasts about 2 seconds

Expiration – lasts about 3 seconds

pause

LUNG VOLUMES /LUNG CAPACITY /RESPIRATORY CAPACITY

LUNG VOLUMES

Tidal volumes, inspiratory reserve volume, expiratory reserve volume, residual volume

LUNG CAPACITY

Inspiratory capacity, expiratory capacity, functional residual capacity, vital capacity, total lung capacity

Tidal Volume (TV): It is the volume of air inspired or expired during a normal respiration. An average value of tidal volume is ~500ml

Inspiratory Reserve Volume (IRV): Additional volume of air a man can inspire after a forcible inspiration. The average value is 2500-3000 ml

Expiratory Reserve Volume (ERV): Additional volume of air a man can expire after a forcible inspiration. The average value is 1000-1100 ml

Residual Volume (RV): The volume of air remaining in the lungs even after a forcible expiration. The average value is 1100-1200 ml

Inspiratory capacity (IC): Total volume of air a person can inspire after a normal expiration. It includes TV+IRV. The average value is about 3500ml

Expiratory capacity(EC): Total volume of air a person can expire after a normal inspiration. It includes TV+ERV. The average value is about 1600ml

Functional Residual Capacity (FRC): It is the volume of air that will remain in the lungs after a normal expiration. It includes ERV+ RV. The average value is about 2300ml

Vital Capacity (VC): It is the maximum amount of air a person can breathe out after a forced inspiration. It includes ERV, TV & IRV. The average value is about – 4600ml

Total Lung Capacity (TLC): It is the total volume of air accommodated in the lungs at the end of a forced inspiration. It includes RV, ERV, TV, &IRV/VC+RV. The average value is about – 5800ml