Dept. of Physical Education and Sports, Poornaprajna College, Udupi

Science Behind the Exercise and Sports

Here we learn the basics of :

- Physiology
- Psychology
- biomechanics
- nutrition and diet
- Anatomy of human body

INTRODUCTION

- In ancient world, every individual had hard work associated with his profession•

- Which is lacking in modern world and hence inculcating a definite time and regular exercise to be a part of our life style is a **MUST.**

EXERCISE - MEANING

EXERCISE

is the repeated rhythmic movements given to body parts to keep it healthy and develop the body parts

PHYSIOLOGY- MEANING

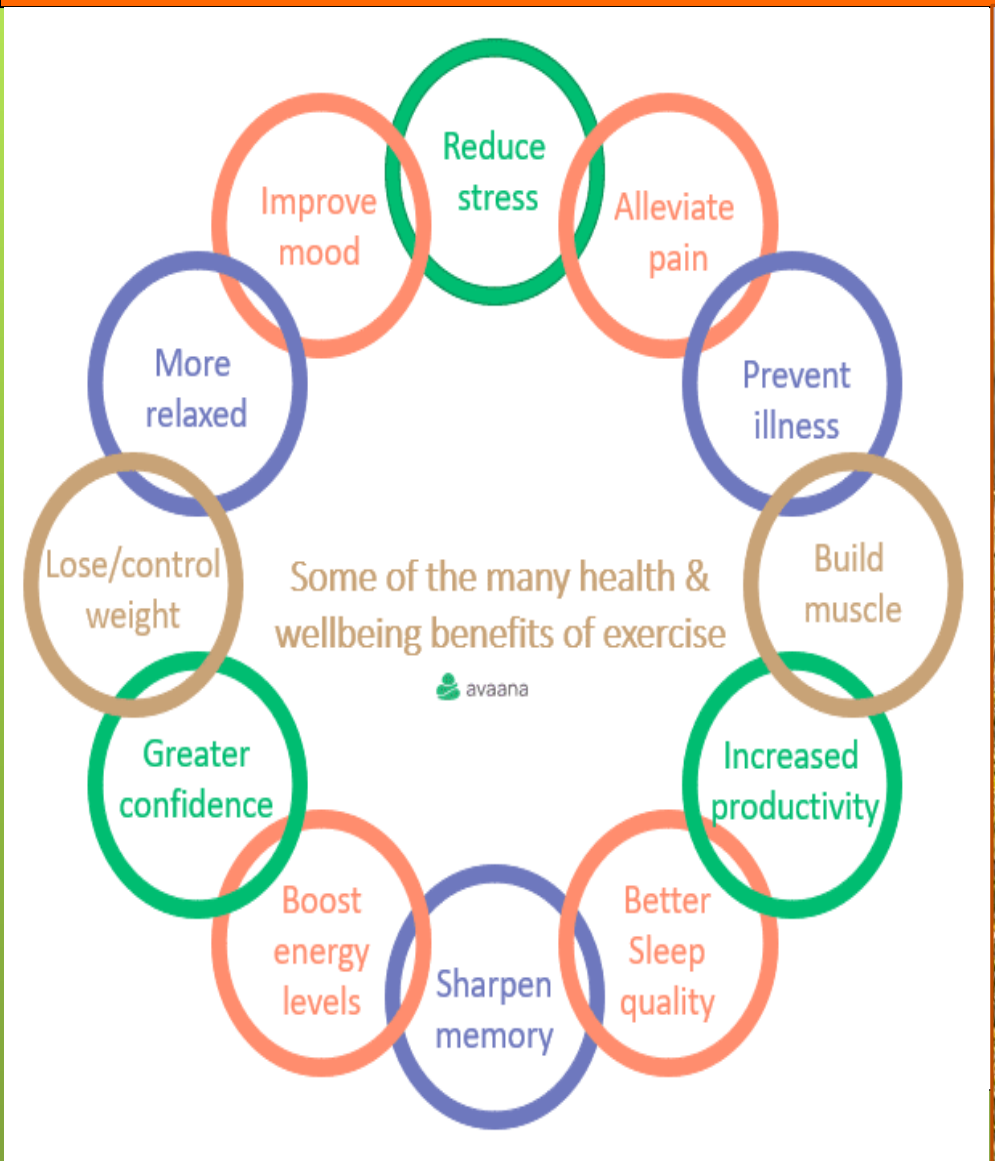
- ***the branch of biology that deals with the normal functions of living organisms and their parts.***
- ***the way in which a living organism or bodily part functions.***

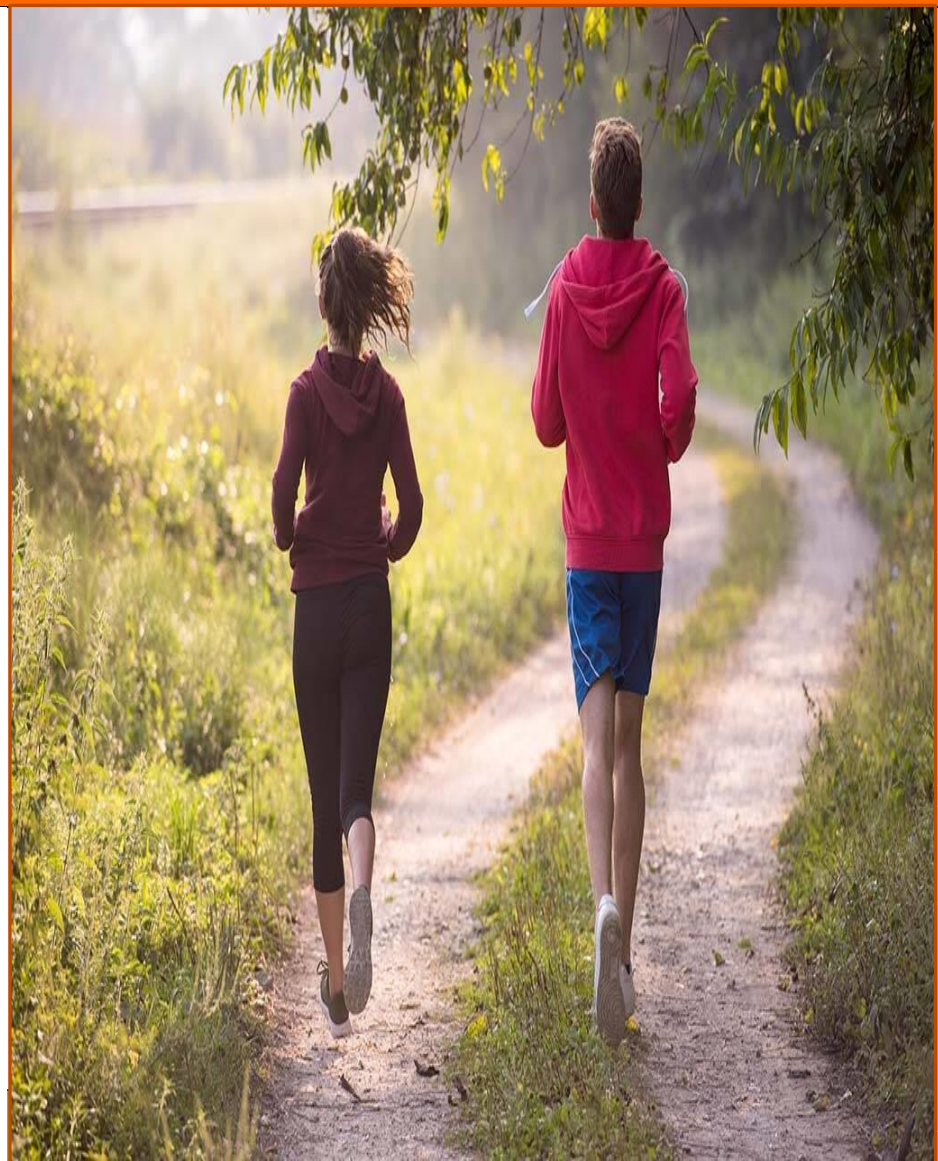
EXERCISE PHYSIOLOGY - MEANING

Is the study of

- **HOW** exercise and sports will affect/effect on body organ.
- **HOW** our body will react to the exercise and sport.

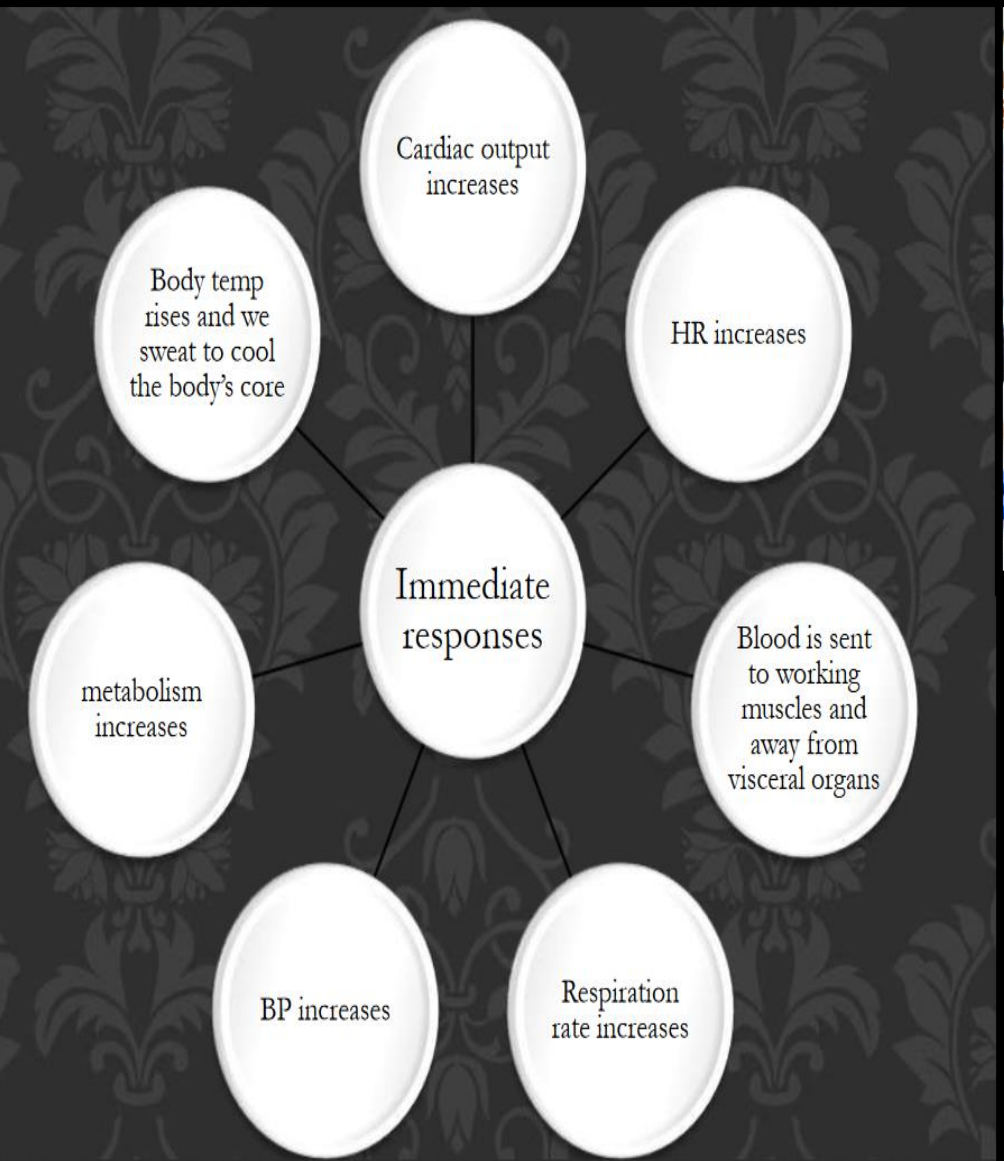
BENEFITS OF EXERCISE – IN GENERAL



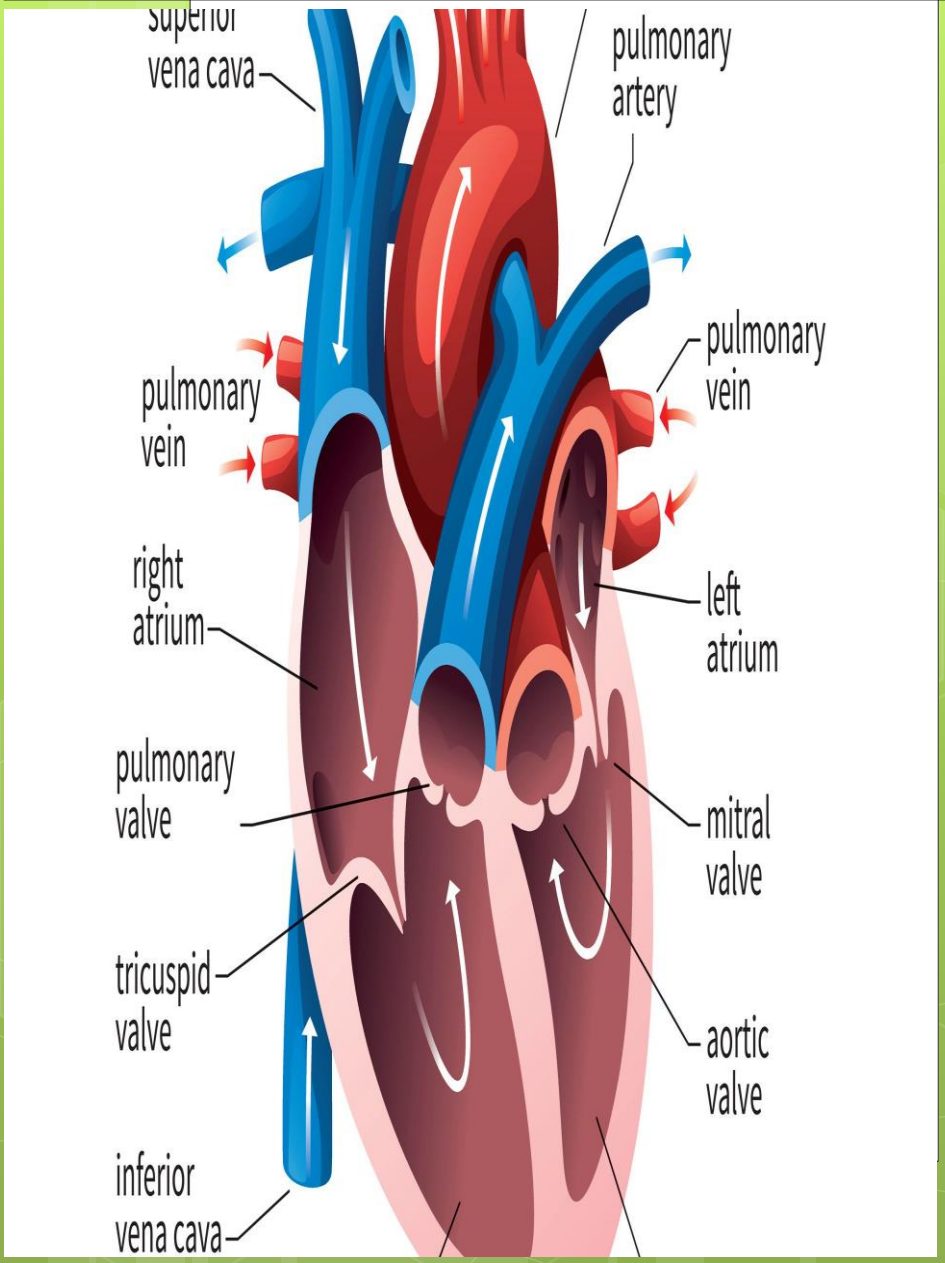


PHYSIOLOGICAL BENEFITS OF EXERCISE

Immediate response

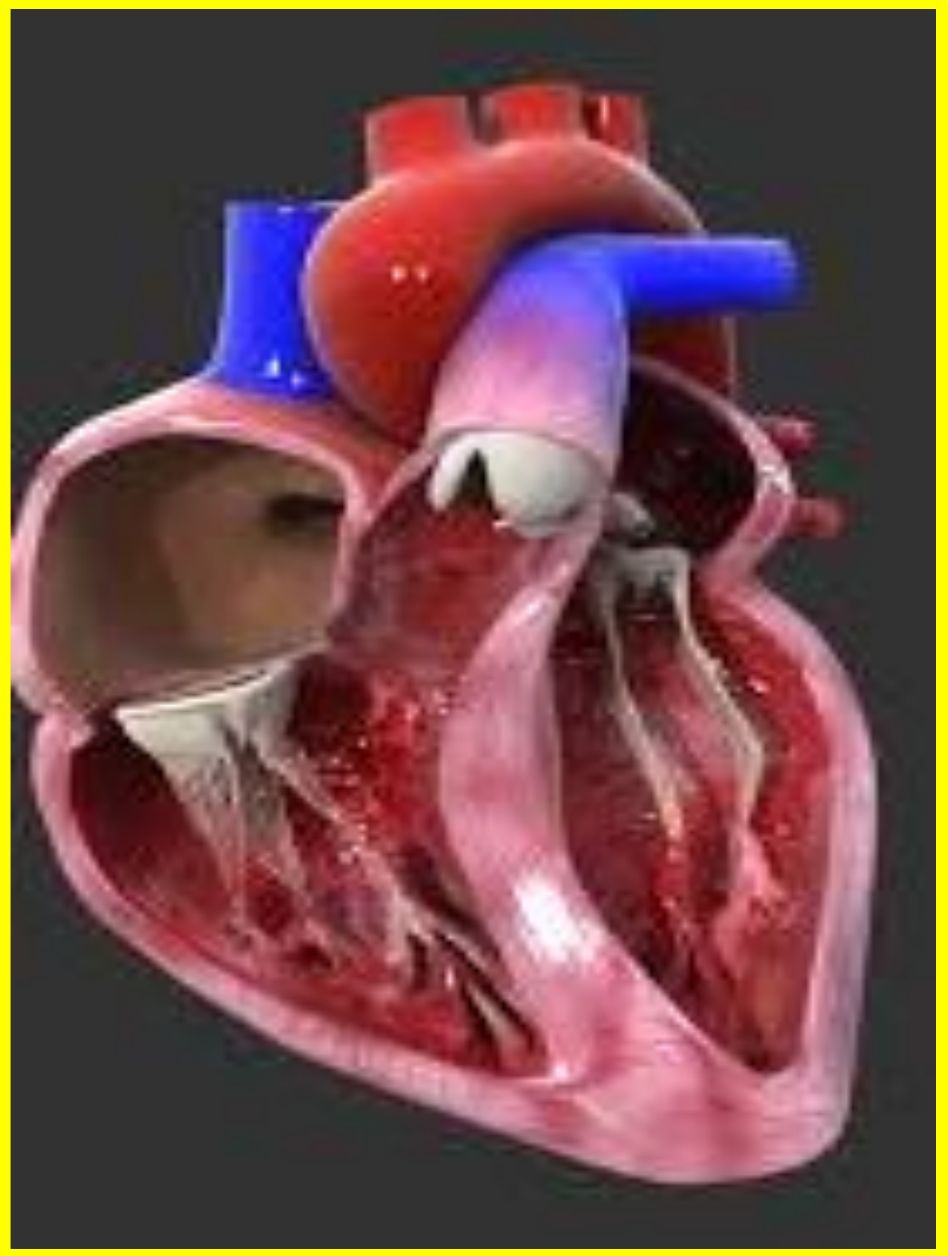


EFFECT ON THE HEART – EXERCIESE



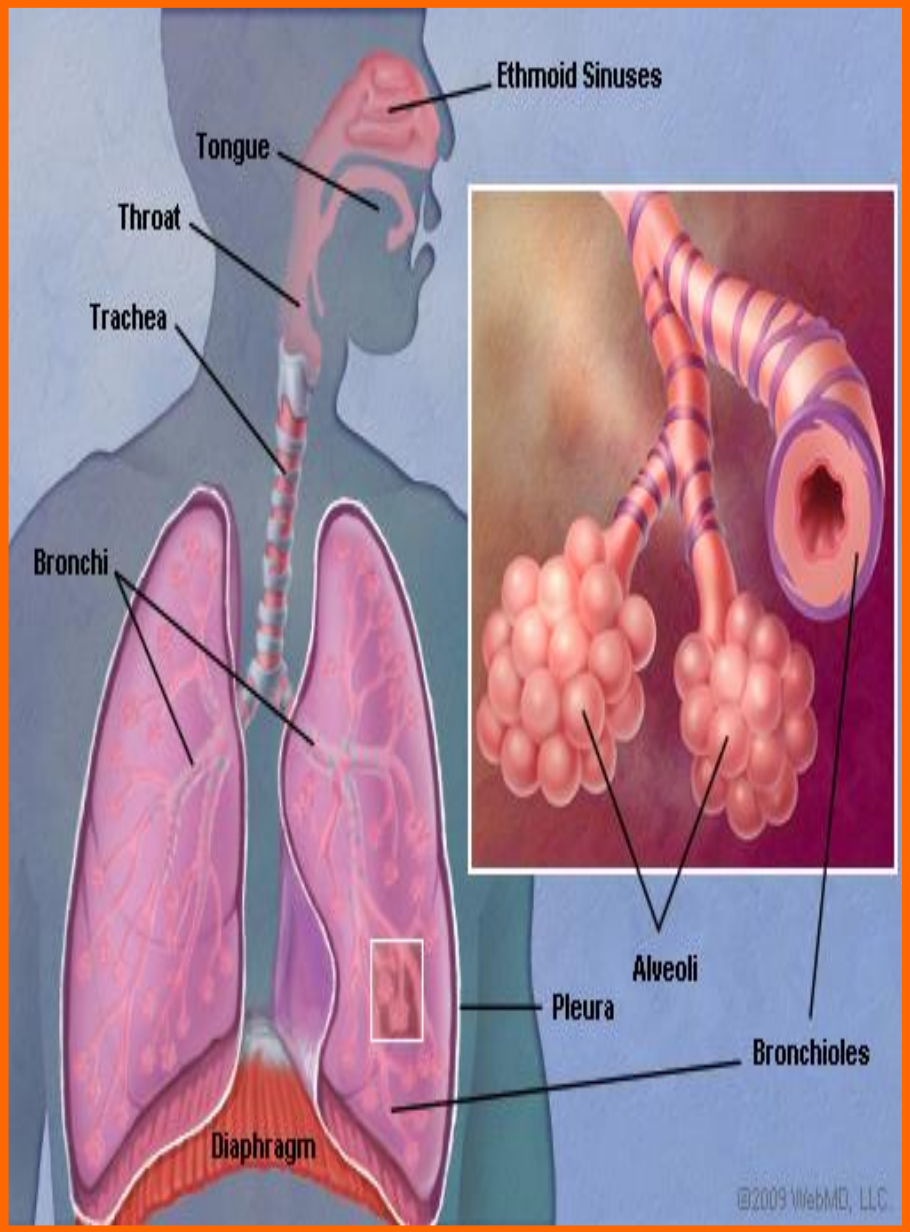
- **Oxygen rich blood is pumped out of the heart to the muscles and organs via artery's (red areas)**
- **De-oxygenated blood is returned to the heart via veins (blue areas)**
- **Artery's have plenty of pressure on them from the heart contracting to force the blood away from the heart**
- **Veins however are not under any pressure. To stop the blood going backwards veins have valves**

EFFECT ON THE HEART – EXERCIESE



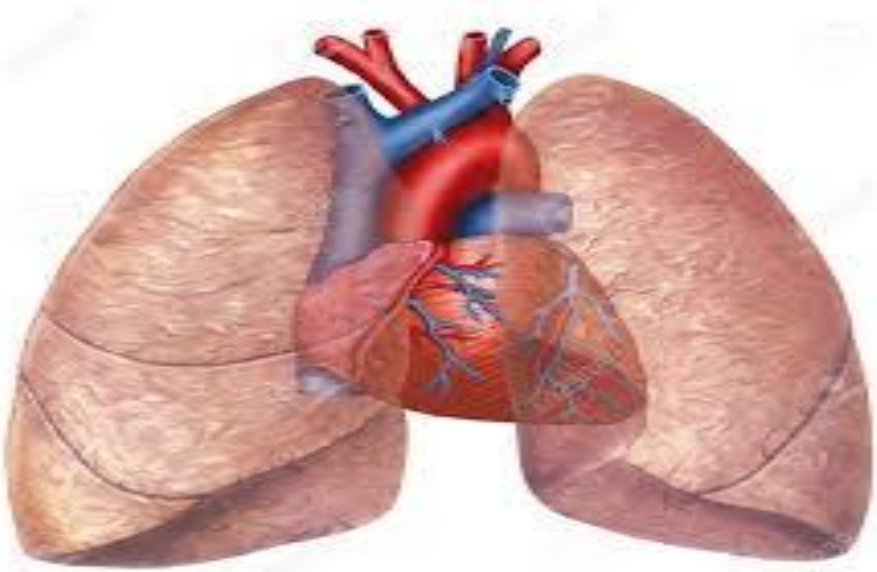
- 5-6 liters of blood is pumped out of heart/min - **WLAKING**
- In moderate-20liters/min - **JOGING**
- Severe exercise-35 liters/min - **RUNNING**
- Cardiac output is directly proportional to oxygen consumption
- This is due to increased heart rate and increased stroke volume
- (70ml/contraction)
- CO=HR x SV

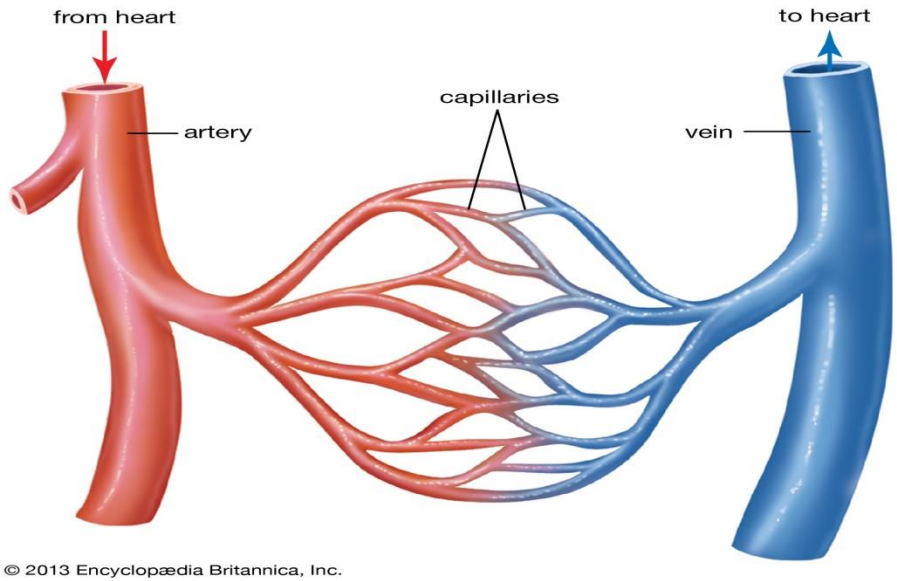
EFFECT ON THE LUNGS – EXERCIESE



- During exercise there is increase in CO2 of blood
- Chemoreceptor in medulla are stimulated
- Stimulation of dorsal respiratory group of neurons
- Increase the rate of respiration
- Removal of CO2 is increased

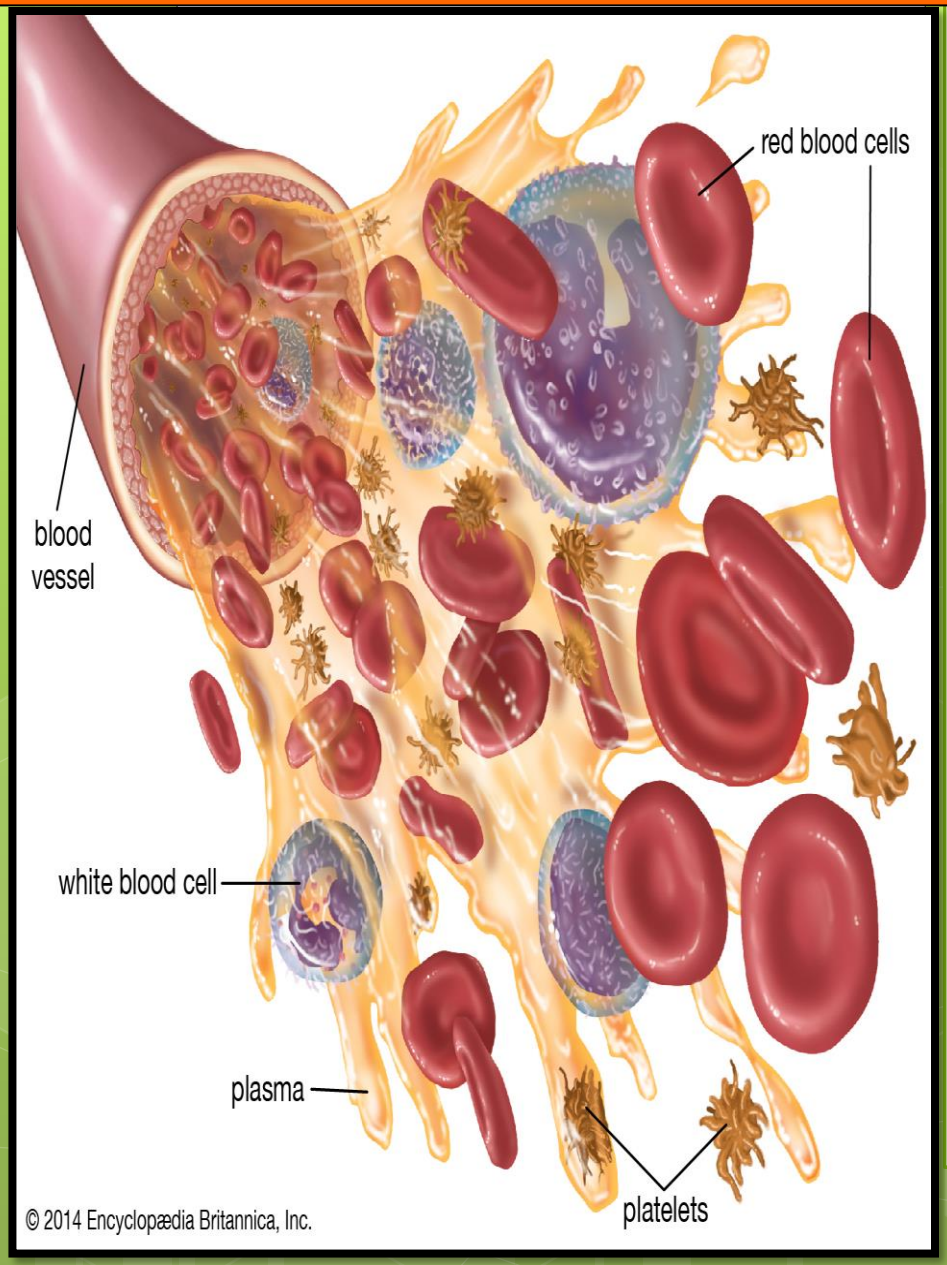
THE HEART AND LUNGS – TOGETHER





- The heart and lungs are connected to supply the body with oxygen rich blood and work together to take away and get rid of carbon dioxide
- *This happens at the capillary networks that cover the alveoli and muscle cells*

CHANGES IN THE BLOOD



- Mild hypoxia: which increases CO2 concentration will lead to pH decrease
- It stimulates the juxtaglomerular cells to synthesize erythropoietin
- So that there is a production of RBCs
- There is increased heat production during exercise which increases the body temperature

CHANGES IN THE BLOOD

- To compensate the body temperature sweating and fluid loss occurs resulting into decreased blood volume which is also due to vasodilatation in skin
- Decreased blood volume results in Hemoconcentration i.e. water is lost through plasma
- That's why severe exercise can even cause dehydration

CHANGES IN THE BLOOD

- Systolic = the pressure exerted on the walls of the arteries when the heart contracts
- Diastolic = the pressure on the walls of the arteries as the heart relaxes (fills)
- Normal BP tends to be around:120/80 mmHg.

Thank You and Questions