# 8<sup>th</sup> CARDIO-RESPIRATORY ENDURANCE/TRAINING PRINCIPLES

### **Definition:**

*Cardio-respiratory Endurance* = Cardio-respiratory endurance refers to the ability of the body to perform prolonged, large-muscle, dynamic exercise at moderate-to-high levels of intensity

- This is the most important part of physical fitness at MCMS.
- The mile run is a test of cardio-respiratory endurance.

## The Heart:

- The heart is about the size of your fist and the most important muscle in the body
- The heart is located in the upper left quadrant of your chest
- It pumps blood that carries oxygen from your lungs to the rest of your body
  R. Atrium, R. ventricle, Lungs, L. Atrium, L. Ventricle, Aorta, Body
- Red blood cells pick up oxygen in your lungs, are pumped back to your heart, which then pumps them to your body's muscles, tissues, and organs
- Veins carry deoxygenated blood to the heart
- Arteries carry oxygenated blood away from the heart
- Systolic pressure: Systolic pressure is when pressure is highest in the arteries and occurs when the heart contracts
- Diastolic pressure: Diastolic pressure is the moment of minimum pressure in the arteries and occurs when the heart relaxes
  - Normal blood pressure is less than 120 (systolic) over 80 (diastolic)

## **Factors Affecting Heart Rate**

Body Position: Heart rate is lowest in the supine position and highest when standing

**Fitness:** Fit persons have a lower working and resting heart rate **Gender and Mood:** Women have a heart rate 5 to 7 beats per minute higher than males because they have smaller hearts and muscles

**Temperature:** The higher the temperature, the higher your heart rate!

- Exercise Intensity: reduce or slow down the effort put forth on hotter days
- Hydration: provide yourself with fluids, before, after and during an activity Your body looses a considerable amount of fluids through sweat

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**Stimulants:** Can increase resting heart rate temporarily by more than 10 beats per minute.

- Sugary Drinks
- Smoking: a smoker's resting heart rate is generally higher than a nonsmoker because the blood's capacity to transport oxygen is weaker.
- $\circ$  Coffee

Depressants: A small amount of alcohol usually relaxes and lowers the heart rate.

• Heavy drinking can lead to heart disease

## Types of Exercise

- Aerobic sustained activity where there is an increase in oxygen flow to the muscles. *Literally means with oxygen* 
  - Heart work: **Endurance** maintaining HR in zone for an extended period of time (Mile, Perimeter)
- **Anaerobic** more intense exercise where the body goes into oxygen debt. *Literally means-without oxygen* 
  - Heart work: **Power/Strength** focuses on building muscular strength (Ramps, Stairs)
  - Heart work: **Speed** focuses on agility/speed and short intervals (100's, Downhills)

## Improving and Maintaining Heart Strength: (FIT Principle)

- Frequency (how often) Aerobic activity at least 3 days a week
- Intensity (how hard) Aerobic activity in which it is done within personal target heart rate
- Time (how long) Aerobic activity for at least 20 minutes at a time

\*\*\* It takes twice as long to regain cardio-respiratory endurance as it does to lose it. If you take a month off, it then takes up to 2 months to regain your previous levels. \*\*\*

## **Benefits**

Exercising 3 times per week for at least 30 minutes in your target heart rate will:

- Increase stroke volume (blood pumped per beat)
- Increase heart size and strength
- Decrease recovery time after exercise
- Decrease blood pressure (pumps more blood with less effort)
- Decrease resting heart rate