Lab 28: Circulatory Physiology

28.1: Cardiovascular Fitness

Introduction

- The animal circulatory system transports oxygen and other nutrients to all cells and carries carbon dioxide and other waste products away
- We will learn how to take pulse and blood pressure for a human and gather information for a fitness table
- We will measure the effect of temperature on the heart rate of a small invertebrate

Key Concept 1: Blood Pressure and Pulse

- Blood moving puts pressure on blood vessel walls
- Blood Pressure: the highest static force that blood exerts against the wall of a vessel
  - Highest in aorta
  - Decreases as blood moves through arterioles, capillaries, venules, and veins
- Pulse: expansion and recoil of the elastic arteries where they pass near the surface of the skin
- Heart Rate: the number of times your heart contracts per minute
- Systolic Pressure: the pressure in the artery during the ventricular contraction phase of the heart cycle; the pressure is in the vessel is highest at this time
- Diastolic Pressure: the pressure in the artery when the ventricles are relaxed. The pressure is at its lowest point, though it does not drop all the way to zero

Key Concept 2: Understanding Blood Pressure

- Measuring systolic and diastolic pressure separately
- The numbers refer to the number of millimeters the pressure will raise a column of mercury
- Typical BP for teenagers: 120/70

Key Concept 3: Measuring Blood Pressure

- Use a sphygmomanometer
  - Inflatable cuff wrapped around the upper arm and a gauge that measures pressure
- stethoscope used to listen to different sounds that occur

Key Concept 4: Procedure for Measuring Blood Pressure

1) Inflate cuff. Once the pressure in the cuff is above subject's systolic pressure, blood cannot flow below cuff and there will be no sound in brachial artery when you listen with a stethoscope
2) As you release the pressure valve and slowly deflate the cuff, blood begins to flow through artery
3) When pressure in cuff is between systolic and diastolic pressure, a tapping sound can be heard with each pulse
   a. First tapping sound indicates that blood has entered artery
      i. Record this as systolic and continue to deflate the cuff until there are no more tapping sounds
4) Last tapping sound is diastolic pressure

Key Concept 5: Measuring Pulse