

Key Terms - Applied Anatomy and Physiology

Part 1

Cardiovascular System

Stroke Volume – The volume of blood pumped out of the ventricles during each contraction.

Cardiac Output – The volume of blood pumped out of the ventricles per minute ($HR \times$ Stroke Volume).

Sympathetic Nervous System – Part of the ANS and can activate an increase in HR.

Parasympathetic Nervous System – Part of the ANS and can activate a decrease in HR.

Vascular Shunting – The redistribution of blood flow around the body.

Myogenic – The heart's ability to create its own contraction.

Chemoreceptors – Responsible for detecting a change in CO_2 /Lactic Acid/Blood Acidity.

Baroreceptors – Responsible for detecting a change in blood pressure.

Proprioceptors – Responsible for detecting a change in muscle movement.

Plasma – The liquid part of blood.

Myoglobin – An oxygen binding protein found in muscle tissue.

Haemoglobin – An oxygen binding protein found in red blood cells

Oxyhaemoglobin – Found when oxygen combines with haemoglobin.

Mitochondria – The part of the cell where respiration and energy production occur.

Disassociation Curve – A graphical representation of the rate at which oxygen separates from haemoglobin and diffuses into the muscle cells.

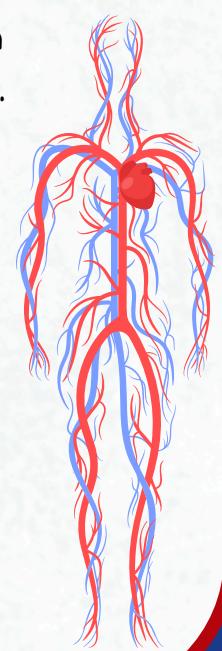
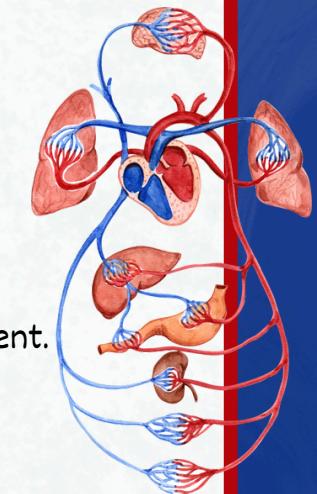
Bohr Shift – The shift to the right that the disassociation curve makes during exercise.

Venous Return – The flow of the blood back to the heart via the veins and specifically the vena cava.

Starling's Law – Stroke volume increases due to an increase in venous return.

Cardiovascular Drift – The increase of HR during when taking part in steady state exercise in a warm environment.

Arterio-venous oxygen difference – The difference between the pressure of the oxygen in the arteries and veins.



Respiratory System

Tidal Volume – Volume of air breathed in or out per breath.

Inspiratory Reserve Volume – Volume of air that can be forcibly inspired following a normal breath.

Expiratory Reserve Volume – Volume of air that can be forcibly expired following a normal breath.

Residual Volume – Volume of air that remains in the lungs after maximum expiration.

Minute Ventilation – Volume of air breathed in or out per minute.

Diffusion – The movement of a substance from an area of high concentration to an area of low concentration.

Partial Pressure – The pressure of an individual gas when it exists amongst a mixture of gases.

Concentration Gradient – The process of particles moving through a solution or gas from an area with a higher number of particles to an area with a lower number of particles.

Stretch Receptors – A sensory receptor that responds to the over-expanding of the lungs.

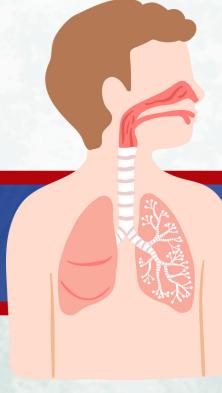
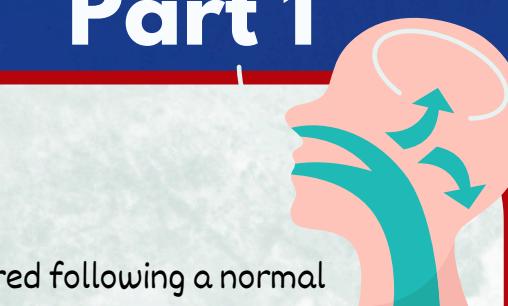
Inspiratory Centre – Located in the medulla oblongata and responsible for breathing (inspiration).

Expiratory Centre – Located in the medulla oblongata and responsible for breathing (expiration).

Cilia – Tiny cells located in the bronchi and bronchioles.

Nicotine – An addictive stimulant found in cigarettes.

Tar – A toxic substance found in cigarette smoke



Energy System

Glycolysis – The process in which glucose is converted to pyruvate to produce energy.

Krebs Cycle – A series of cyclical chemical reactions that take place in the mitochondria.

Electron Transport Chain – A series of chemical reactions that take place in the cristae of the mitochondria.

Mitochondria – The working organelles that keep the cells full of energy.

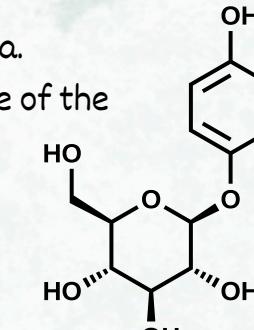
Beta-Oxidation – The breakdown of fatty acids in order to provide ATP.

ATP – An organic chemical that provides energy in living cells.

The Energy Continuum – The sequence which covers the type of respiration required during exercise.

EPOC – Excess post-exercise oxygen consumption. The amount of oxygen taken on during recovery above the resting rate.

Vo₂ Max – The maximum volume of oxygen that can be consumed by the working muscles per minute.





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Part 2

Musculoskeletal System

Sagittal Plane - Divides the body into a left and right section.

Frontal Plane - Divides the body into a front and back section.

Transverse Plane - Divides the body into a top and bottom section.

Transverse Axis - From hip to hip.

Longitudinal Axis - Vertical line - top to bottom.

Sagittal Axis - Stabs through the body.

Articulating Bones - Where two or more bones meet to allow movement at a joint.

Tendons - Fibrous tissues that join bone to muscle.

Ligaments - Strong, flexible fibre that connects bones to other bones.

Flexion - Movement decreasing the angle between body parts (bending).

Extension - Movement increasing the angle between body parts (straightening).

Dorsi-Flexion - Flexing the toes so that they move closer to the shin.

Plantar-Flexion - Extending the toes down, away from the shin.

Adduction - Movement of a body part toward the body's midline.

Horizontal Adduction - Movement towards the body from a 90 degree position.

Abduction - Movement of a body part away from the body's midline.

Horizontal Abduction - Movement away the body from a 90 degree position.

Antagonistic Pair - Two muscles working together. One contracts while the other relaxes.

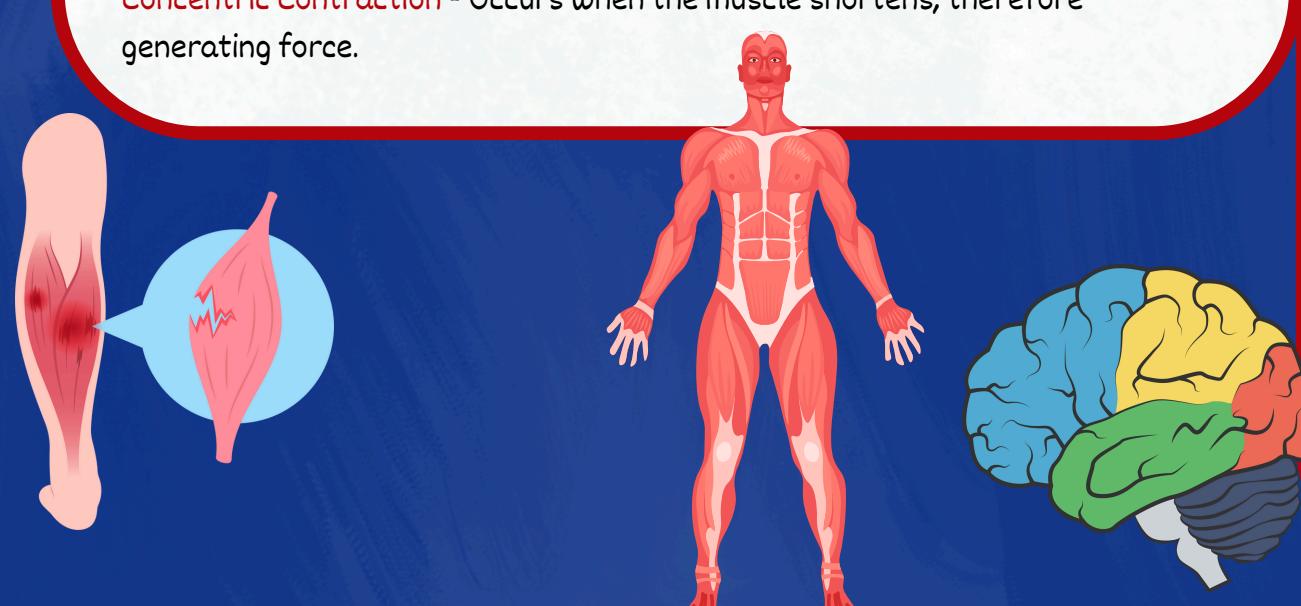
Agonist - Muscle or group responsible for the movement.

Antagonist - Acts to produce the opposite action of the agonist.

Isometric Contraction - Where a muscle contracts but the length of the muscle does not change (therefore it doesn't move).

Eccentric Contraction - Occurs when the muscle lengthens due to a greater opposing force.

Concentric Contraction - Occurs when the muscle shortens, therefore generating force.

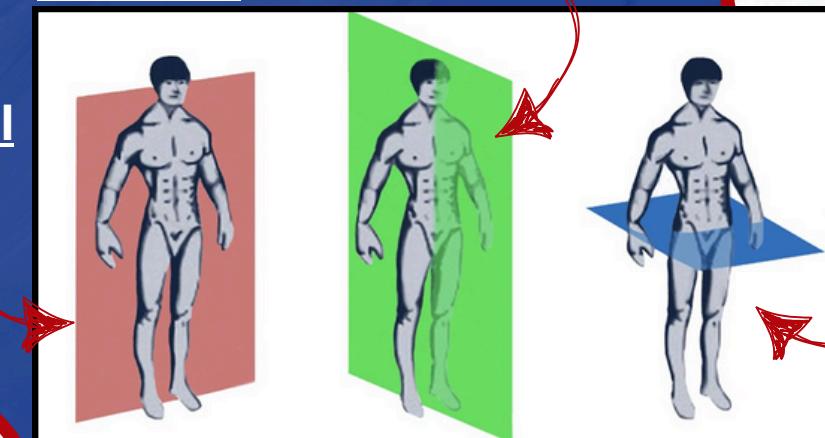


Planes

Frontal Plane



Sagittal Plane

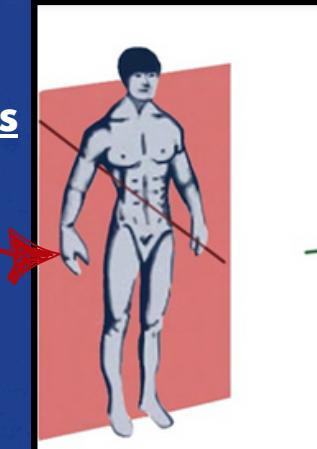


Transverse Plane



Axes

Sagittal Axis



Transverse Axis



Longitudinal Axis



Neuromuscular System

Neuromuscular System - The nerves and the muscles working together in order to produce different movements.

Type I Slow Oxidative - A slow twitch muscle fibre used during endurance events.

Type IIa Fast Oxidative Glycolytic - A fast twitch muscle fibre with some resistance to fatigue.

Type IIx Fast Glycolytic - A fast twitch muscle fibre capable of producing a powerful contraction.

Motor Unit - Made up of a motor neurone and skeletal muscle fibres.

Motor Neurone - Nerve cells located in the motor unit. Receive impulses sent from the brain.

Wave Summation - Repeated nerve impulses resulting in a stronger contraction.

Tetanic Contraction - A number of fast impulses resulting in a sustained muscle contraction.

Spatial Summation - A number of motor units receiving impulses at the same time, resulting in a more powerful contraction.

PNF - Proprioceptive Neuromuscular Facilitation. An advanced stretching technique.

Muscle Spindles - A proprioceptor that prevents a muscle from overstretching.

Golgi Tendon Organs - A proprioceptor that detects tension and signals for a muscle to relax.

