

# 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 ( $HR \times \text{Stroke Volume}$ ).

**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 an 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.

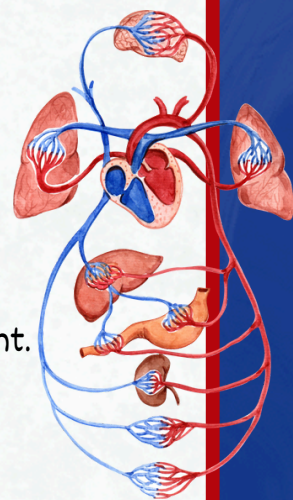
**Bohr Shift** – The shift to the right that the disassociation curve makes during exercise.

**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.

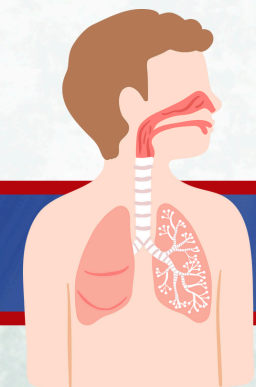
**Inspiratory Centre** – Located in the medulla oblongata and responsible for breathing (inspiration).

**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



ATP



## 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.

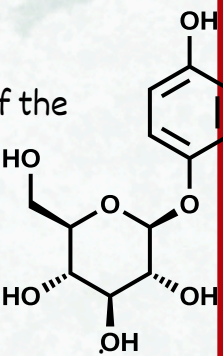
**Beta-Oxidation** – The breakdown of fatty acids in order to provide ATP.

**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.





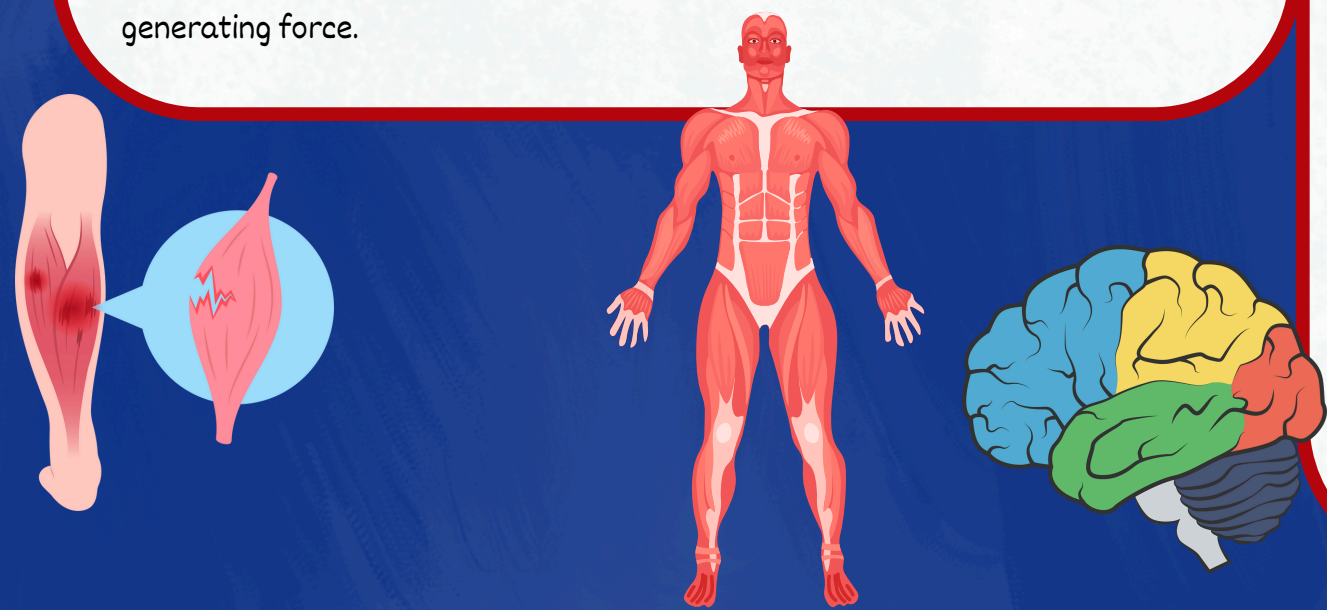


# Key Terms - Applied Anatomy and Physiology

## 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.

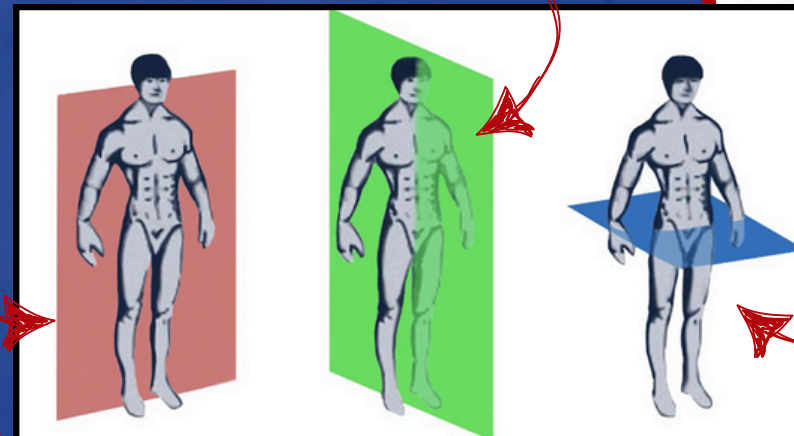


### Planes

#### Frontal Plane



#### Sagittal Plane

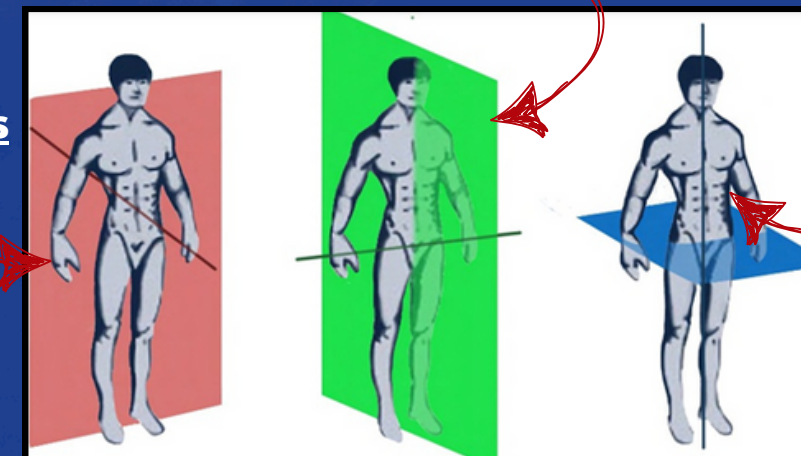


#### Transverse Plane



### 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.

