Ken Stimpson GCSE Physical Education – Aerobic/Anaerobic and Long Term Effects of Exercise

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Aerobic and Anaerobic exercise – two methods of energy production by the body (Energy: the capacity to do work)
Two factors determine which method is used: **Intensity & duration**

Aerobic energy production – takes place in the presence of oxygen

glucose + oxygen → energy + carbon dioxide + water

Exercise intensity is moderate/low for a sustained period of
i.e. marathon runner/endurance cycling

By products are released as sweat and CO2 exhaled.

Anaerobic energy production – takes place in the absence of oxygen

glucose → energy + lactic acid

Intensity of anaerobic activity is high as muscle contraction are powerful & quick time.
00m sprinter/long jump

By product (lactic acid) builds up and causes fatigue.

Cardiovascular system

Cardiac equation – Cardiac output (Q) = Stroke Volume (SV) x Heart Rate (HR)

Long term effects of exercise

1. Cardiac hypertrophy – (left ventricle) this is the increased size of the heart due to training. This impacts on the cardiac equation above.

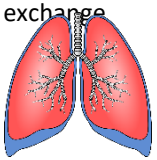
   Lower resting HR - Increased maximum Q - Increased SV

2. Increased elasticity in the walls of arteries and veins – more efficient constriction and dilation.
3. Increased number of red blood cells – has capacity to carry more oxygen to working muscles.
4. More efficient 'vascular shunt'
5. More capillaries
6. Lower blood pressure at rest

Respiratory system

Long term effects of exercise

1. Increased capilliarisation – better blood supply around the alveoli.
2. Increased number of alveoli – results in better gaseous exchange (oxygen delivery and waste product removal)
3. Increased strength of diaphragm and intercostal muscles – this increased tidal volume and vital capacity.
4. Increase in vital capacity



Skeletal system

Long term effects of exercise

1. Increased bone density – strong bones reduce the risk of injuries.
2. Increased strength of ligaments and tendons – allows the body to change direction quickly without injury occurring.

Muscular system

Long term effects of exercise

1. Muscular hypertrophy – increase in muscle size and strength/endurance.
2. Increase size and number of mitochondria – produces more energy aerobically.
3. Increased tolerance to lactic acid – reduces muscle fatigue.

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Term	Definition/notes/concept

Keywords: