

### 1.1.4: The long-term effects of exercise on the body systems

#### The cardiovascular system

Resting heart rate and blood pressure will drop as the system becomes more efficient.

Cardiac hypertrophy will take place as the cardiac muscle of the heart becomes larger and stronger.

Stroke volume and cardiac output will increase because the heart will be able to contract with more power.

Capillarisation will take place resulting in an increased surface area in the body where the exchange of gases, nutrients, and removal of waste products can take place.

#### The cardiorespiratory system

Minute ventilation (the amount of air being breathed in and out per minute) will increase.

Breathing rate or breathing frequency (the number of breaths a minute) will decrease.

Tidal volume (the amount of air that passes in and out of the lungs during breathing) will increase.

Capillarisation will take place resulting in an increased number of capillaries in the body.

Hypertrophy of the diaphragm and intercostal muscles will take place.

#### The muscular-skeletal system

Bone density levels will increase in the body.

Bone strength will increase in the body.

Muscle elasticity will increase which increases the mobility or range of movement at the joint, and reduces the likelihood of the sports performer suffering a muscle injury due to their improved flexibility.

Muscle hypertrophy will take place if an athlete has undertaken a resistance or weight training programme. This will result in the athlete benefitting from larger and stronger muscles which will lead to improvements in their sporting performance.

#### Energy systems

The energy systems will become more efficient meaning they can produce more energy during exercise.

The energy systems will demonstrate an increased tolerance to lactic acid, meaning the athlete can exercise for longer, at a higher intensity, before suffering from fatigue and tiredness.

There will be increases to the energy system thresholds, meaning that the athlete is able to operate for longer in the training zone for each system, before fatigue causes them to stop exercising.