Work Sheet 18.1 – Short Term Effects of Exercise on the Musculoskeletal System

Short term effects are the responses that occur immediately that can be seen or experienced when you exercise.

The following responses occur in the musculoskeletal system:

- An increase in joint temperature which leads to an increase in the secretion and thinning of synovial fluid.
- An increase in blood flow to the exercising muscle.
- An increase in the demand for fuel (energy) by the working muscle.
- An increase in the waste products produced by the working muscle and the demand for them to be removed (lactic acid).
- Fibres in the muscles breaking down.
- An increase in body temperature due to the muscles working harder.
Work Sheet 18.2 – Short Term Effects of Exercise on the Cardiovascular System

Short term effects are the responses that occur immediately that can be seen or experienced when you exercise.

The following responses occur in the cardiovascular system:

- Your heart rate increases as you start to exercise and will continue to rise as exercise intensity rises.
- Stroke volume (the volume of blood being pumped out per beat) also increases when exercise starts, due to the increase of oxygen demand by the working muscles.
- Less blood is pumped to organs that are not in need of oxygen and the volume of blood delivered to the working muscles increases with every beat of the heart (known as vascular shunt).
- Blood delivery rate increases as heart rate continues to increase.
- Blood pressure increases as more blood is transported at a much faster rate to the working muscles.

Thermoregulation is the body’s ability to maintain its core temperature (normally 37° Celsius) and is an important aspect of human homeostasis. Most body heat is generated in the deep organs, especially the liver, brain, and heart, and in contraction of skeletal muscles, especially when engaged in physical activity. During exercise, heat is generated; increasing the body temperature and this increase is controlled by radiation, conduction and evaporation.
Work Sheet 18.3 – Short Term Effects of Exercise on the Respiratory System

Short term effects are the responses that occur immediately that can be seen or experienced when you exercise.

The following responses occur in the respiratory system:

- Breathing rate – The number of breaths per minute, which at rest is 12-16 breaths a minute, but as exercise starts this increases. Healthy young untrained adults increase their breathing rate to 35-45 breaths per minute although elite endurance athletes breathe as rapidly as 60-70 times each minute during maximal exercise.
- Tidal volume – The volume of air breathed in or out per breath, which at rest is 0.5 litres, but as exercise starts this increases.
- Minute ventilation – The volume of air breather per minute, which at rest is 6 litres per minute, but as exercise starts this increases.
- Vital capacity – The maximum amount of air that can be forcibly inhaled and exhaled in one breath, which at rest is 5 litres, but as exercise starts it increases.
- Total lung capacity – All the air in the lungs after a maximum inhalation, which at rest is 6 litres, but as exercise starts it increases.
- Residual lung volume – The amount of air left in the lungs after a forced breath out, which remains the same at rest and during exercise, at 1200ml.
- All of these changes take place so that more air moves in and out of the lungs; which means there will be more opportunity for gaseous exchange to occur in the alveoli.