TEL PE Revision

Revision Series 2022

OCR A-Level Physical Education

Anatomy & Physiology

• Notes pages •

The EverLearner

Welcome to the 2022 Revision Series for OCR A-Level Physical Education! We hope you find it useful. Before we start, please make sure you have all of the documents below, as they will be great help for your revision:

- Notes pages
- Practice questions
- Mark schemes
- Model answers
- Infographics
- Revision timetable

You will find all these documents on our OCR A-Level PE Revision page (https://pages.theeverlearner.com/2022-ocr-a-level-pe-revision).

Joints, movement and muscles

Lower body

These performers are completely still in the ready position before a speed skating race. Complete the table to analyse this position at the ankle.

Joint	Articulating bones	Type of movement	Agonist	Type of contraction
Ankle				

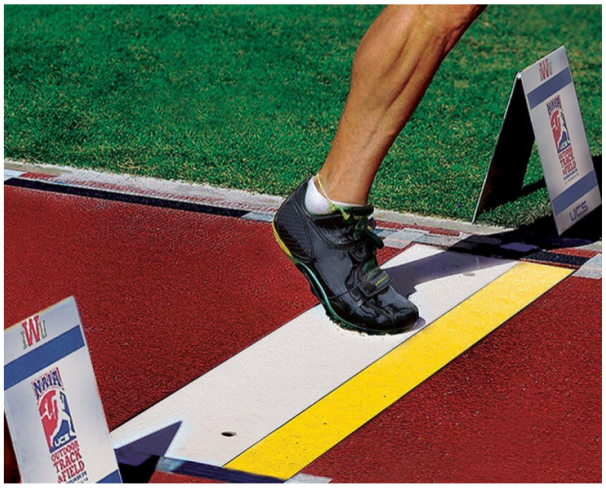
Notes

Complete the table to analyse the lunge action at the hip.

Joint	Phase	Joint movement	Agonist	Type of contraction <u>during the downward motion</u>
Hip	Left (front)			
	Right (back)	Extended	Illiopsoas	

Notes

Complete the table to analyse the long jump take-off action at the ankle.



Joint	Type of joint	Joint movement	Agonist	Plane of movement
Ankle				

Notes

Complete the table to analyse the box jump **landing** action at the hip **and** the knee. The performer is still in the **downward** motion .

Joint	Type of joint	Joint movement	Agonist
Hip			
Knee			

Notes

CV system during exercise of differing intensities & during recovery

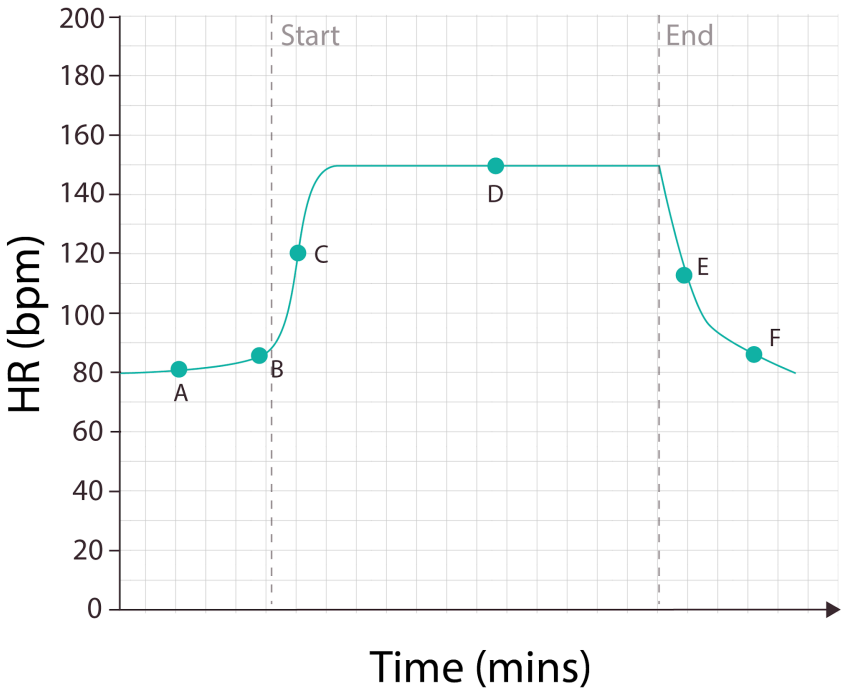
Heart Rate Values

Cardiac output = Stroke volume x Heart rate

Notes

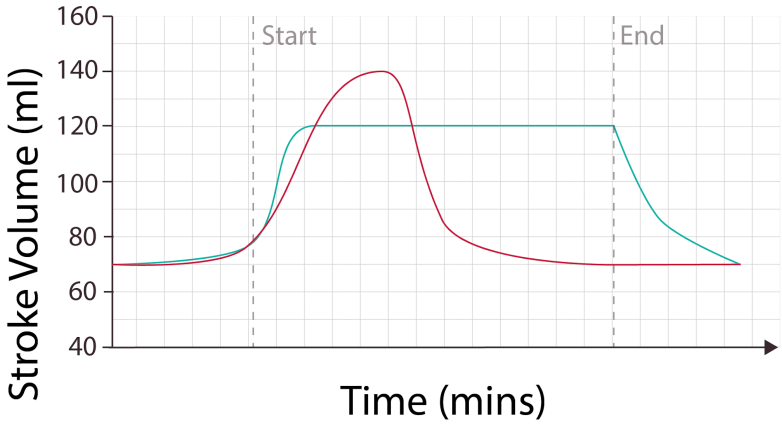
Graphical Representation of HR

Submaximal



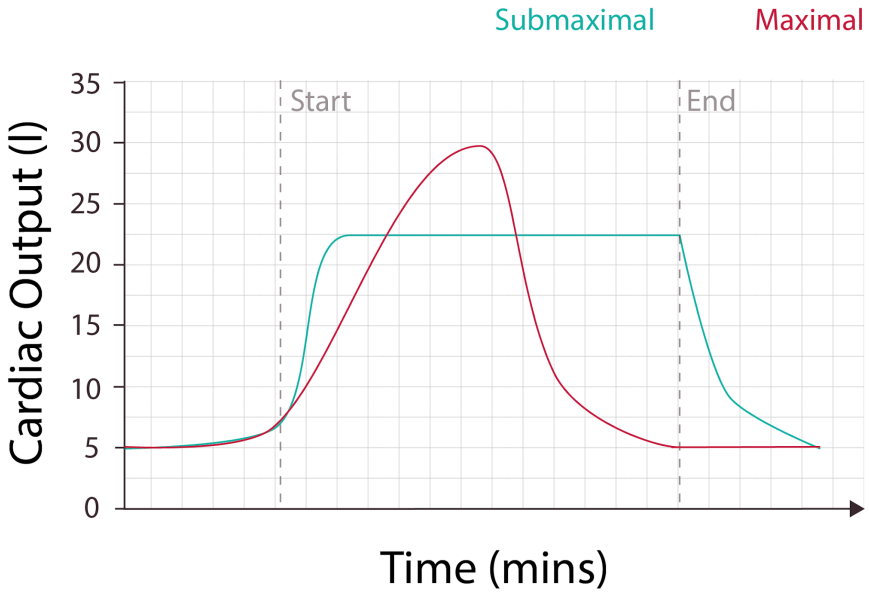
Notes

Graphical Representation of Stroke Volume



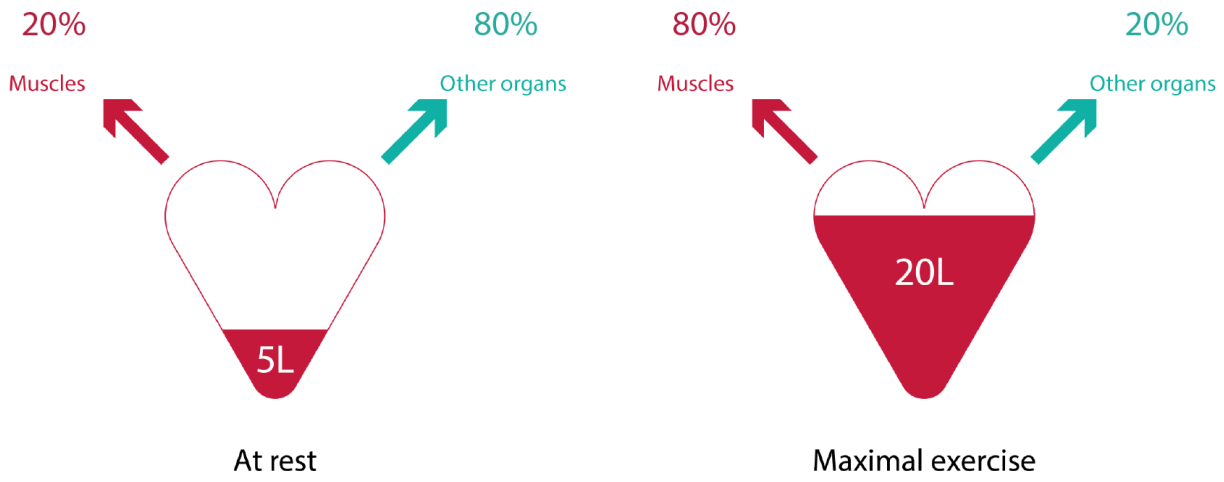
Notes

Graphical Representation of Cardiac Output



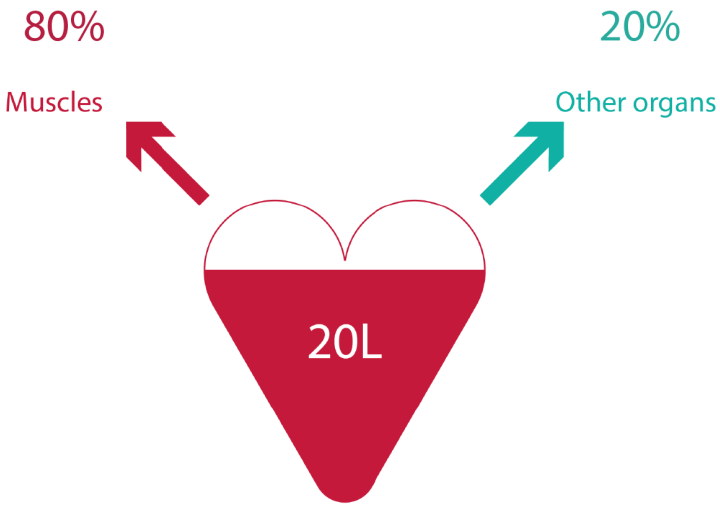
Notes

Distribution of Q at rest



Notes

Distribution of Q during exercise

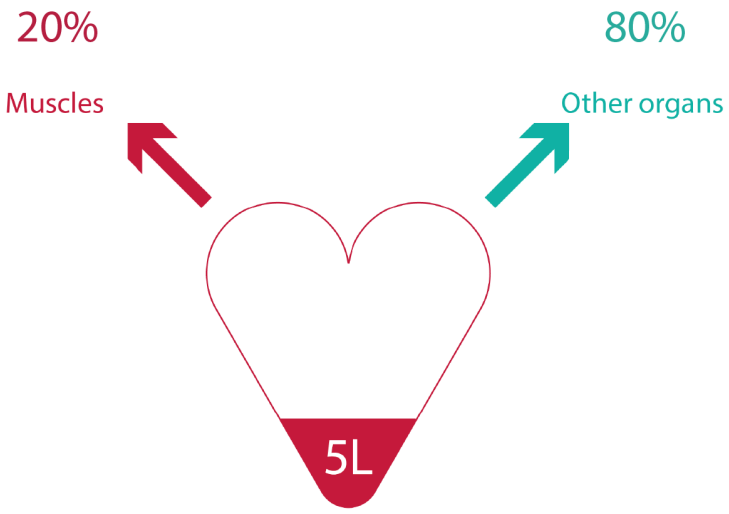


Maximal exercise

- Arterioles leading to the working muscles vasodilate.
- Precapillary sphincter muscles leading to the capillary beds at the working muscles vasodilate.
- Vascular shunt occurs.
- Q shunted through central capillary to increase resistance to blood flow and redirect to the skeletal muscle.
- Arterioles leading to the other organs vasoconstrict.
- Precapillary sphincter muscles leading to the capillary beds at the other organs vasoconstrict.

Notes

Distribution of Q during recovery



At rest

- Q shunted through central capillary at the muscle to increase resistance to blood flow and redirect to the other organs.
- Q shifts from 80% to skeletal muscle down to 20% to skeletal muscle gradually.
- Arterioles leading to the working muscles vasoconstrict.
- Precapillary sphincter muscles leading to the capillary beds at the working muscles vasoconstrict.
- Arterioles leading to the other organs vasodilate.
- Precapillary sphincter muscles leading to the capillary beds at the other organs vasodilate.

Notes

Venous return during exercise and recovery					
General	Gravity	Smooth muscle within veins	Pocket valves within veins	Respiratory pump	Skeletal muscle pump
Venous return is the volume of blood returning to the right atrium.	Blood from the superior areas of the body return to the heart via the superior vena cava.	Pulses to increase blood pressure.	Prevent backflow of blood.	Action of the respiratory muscles contracting during inspiration causes an increased pressure in veins close to the heart.	Veins run through skeletal muscles.
Starling's law	During inversion, the opposite occurs. This can be applied to elevated leg shakes.	Lumen within veins which are normally large, becomes less and blood is forced back to the heart.	During diastole	Harder we breathe, the more the impact.	Action of muscular contraction causes an increase in blood pressure.
SV = venous return			Only positioned in veins		Jog back into position.
			More frequent in more distal (from the left ventricle) veins		Perform an active cool-down.

Notes

Notes

Regulation of heart rate during exercise				
Neural factors			Hormonal factors: Adrenaline	Intrinsic factors: Heart temperature and contractility
Movement	Blood chemistry	Blood pressure	Release of adrenaline directly stimulates the SA node.	Heart is myogenic and can sense changes in temperature and changes in contractility and can stimulate the SA node to respond appropriately.
Proprioceptors detect increased/decreased movement/muscle tension/tendon length.	Chemoreceptors detect decreasing/increasing pH/increasing/ decreasing blood acidity.	Baroreceptors detect an increase/decrease in blood pressure.		
Muscle spindle	Caused by the presence of greater/lesser CO2 and lactic acid		SA node increases the rate of contraction.	
Golgi tendon organ	Chemoreceptors in the aorta (peripheral) and brain (central)			
Also known as 'mechanoreceptors'				

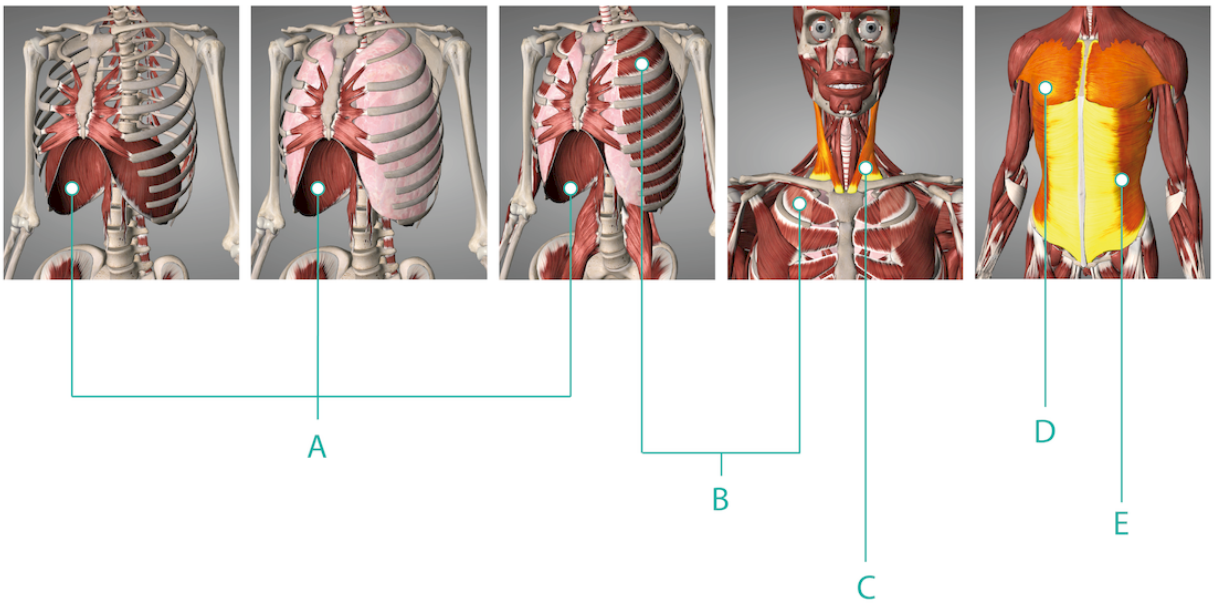
Notes

Respiratory system
during different intensities & recovery

Minute Ventilation

Minute ventilation = Tidal volume x Breathing frequency

Notes

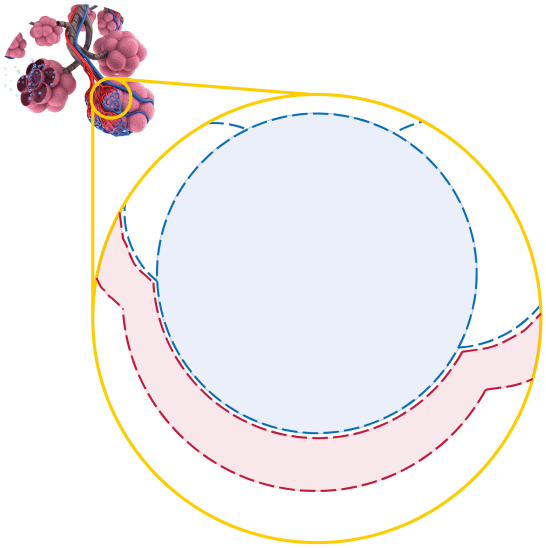


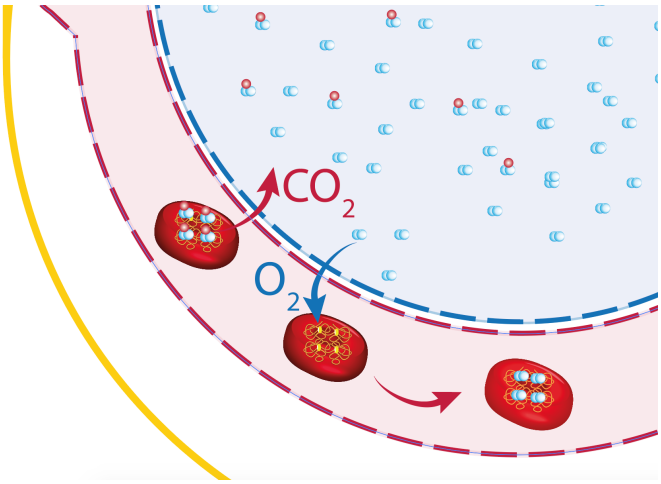
Notes

Regulation of breathing during activity of differing intensities and during recovery

Neural factors		Blood chemistry
Movement	Blood pressure	Chemoreceptors detect decreasing pH/increasing blood acidity.
Proprioceptors detect increased pressure/movement.	Baroreceptors detect an increase in blood pressure.	
Muscle spindle		Caused by the presence of greater CO2 and lactic acid
Golgi tendon organ		Chemoreceptors in the aorta (peripheral) and brain (central)
Also known as 'mechanoreceptors'		

Notes



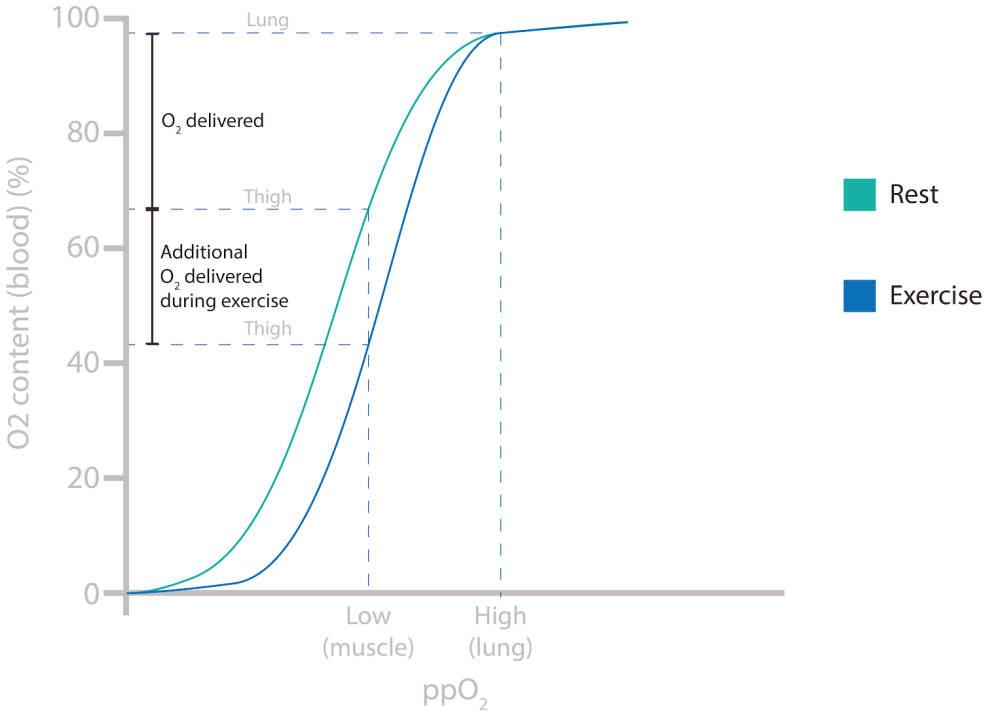


Notes

Effect of differing intensities of exercise and recovery on gas exchange at the alveoli and muscle			
Exchange at rest	Exchange during submaximal exercise	Exchange during maximal exercise	Exchange during recovery
Through the process of diffusion	**Increased** diffusion gradient	**Further increased** diffusion gradient	
Net movement of gases down the diffusion gradient from high to low concentration across a partially permeable membrane	**Greater quantities** of oxygen move from high concentration in the alveolus to **even lower** concentration in the capillary	**Yet even greater** quantities of oxygen move from high concentration in the alveolus to **yet even lower** concentration in the capillary	
Oxygen moves from high concentration in the alveolus to low concentration in the capillary	**Greater quantities** of carbon dioxide moves from **even higher** concentration in the capillary to low concentration in the alveolus	**Yet even greater quantities** of carbon dioxide moves from **yet even higher** concentration in the capillary to low concentration in the alveolus	
Carbon dioxide moves from high concentration in the capillary to low concentration in the alveolus			

Notes

O_2 dissociation curve

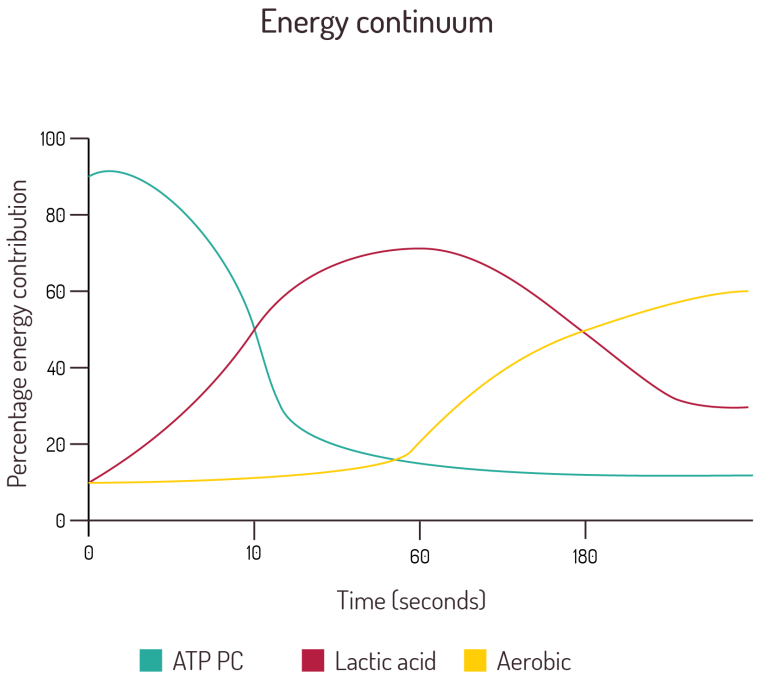


Notes

ATP resynthesis during differing intensities

Energy continuum

The relative contribution of **all three** energy systems to energy transfer.



Notes

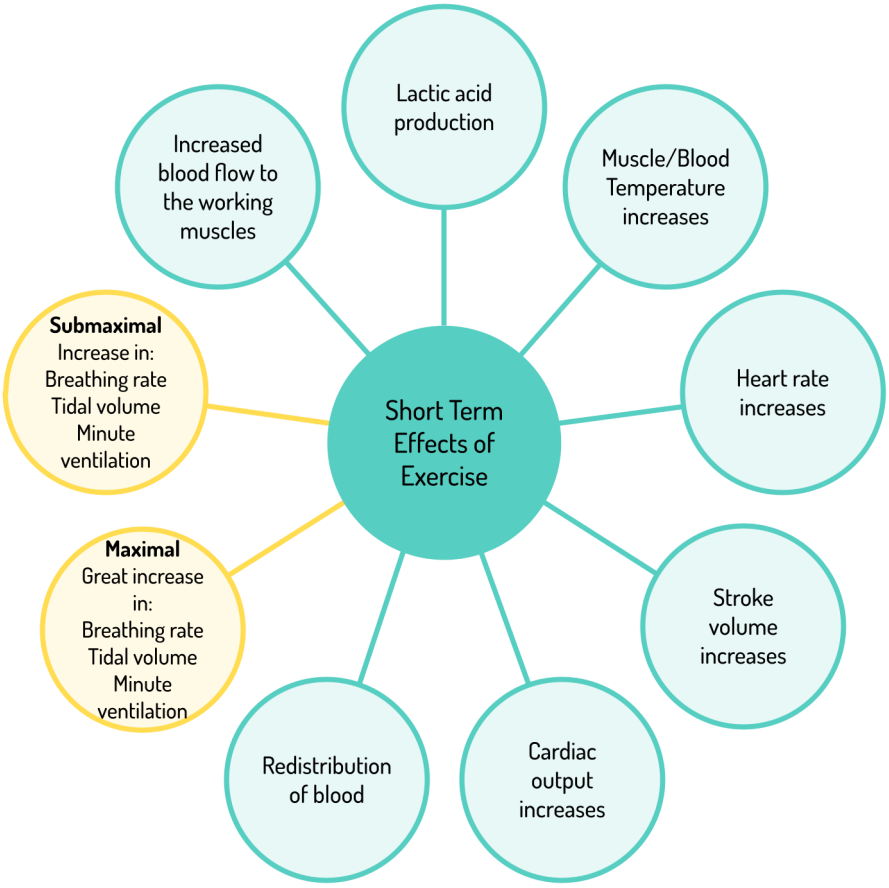
Interplay of energy systems during intermittent exercise			
Factor	ATP/PC	Glycolytic	Aerobic
Intensity	Very high intensity/Maximal	High intensity	Moderate intensity
Duration	Up to 10s duration	Up to 120s duration	Up to 2 hours duration
Recovery periods	• 50% recovery in 30s • 100% recovery in 2-3 minutes • Work relief ratio: 1:3+	• 5 minutes recovery • Work relief ratio: 1:2	• No recovery other than repaying 02 deficit created by anaerobic work • Work relief ratio: 1:1 or less
Fitness level			

Notes

Exercise at altitude

Notes

Short-term effects of exercise



Notes

Aerobic adaptations

Notes