

Physiological factors in sport essay



**ASSIGN
BUSTER**

In this assignment I will be looking at describing thermoregulation in hot and cold climates.

That will be looked at within the first part of the my assignment and then within the second part of the assignment I will be showing an understanding of the effects that altitude and water have upon the physiological functions of the body. Thermoregulation: Heat can be lost through one of the following four reasons:> Radiation> Conduction> Convection> EvaporationHeat can be gained through one of the following four reasons:> Increasing metabolic rate> Increasing radiation> Increasing convection> Increasing conductionThe rate of heat loss for radiation, conduction and convection will depend upon the temperature gradient between the individual and the environment. The area through which heat loss can occur and the thermal conductivity co-efficients for each mode of heat loss. Heat is lost threew radiation when taking the following points into consideration:> Temperature gradient> Infrared rays> No physical contacts> At rest: 60% heat loss> Dependant on environmental conditionsHeat is lost threew conduction when taking the following points into consideration:> Small amounts of conduction> Transferring of heat from the body to cooler objectsHeat is lost threew convection when taking the following points into consideration:> Heat transmitted by air or water> Air or water is warmed and moved away> Dependant on air flow> Water is 25 more effective than air at coolingHeat is lost threew evaporation when taking the following points into consideration:> Approx 25% of heat lost threew rest> Environmental dependant> Heat transfer from body to water on surface of skin> Converted to gas> Dependant on temperature, skin surface and convective

currents Thermoregulation is achieved by a combination of functional and behavioural responses.

The control of temperature is regulated by the hypothalamus, a region of the forebrain. It contains a heat loss centre and a heat gain centre. Temperature sensitive neurones are situated in the hypothalamus. They detect changes in the temperature of the blood flowing through the brain.

The thermoregulation centre of the hypothalamus also receives information via sensory nerves from thermo receptors located in the skin and internal organs. The hypothalamus connects with the rest of the body by the nervous system. When the body temperature is lower than normal, the heat gain centre inhibits activity of the heat loss centre, and impulses are sent to the skin, hair erector muscles, sweat glands and elsewhere that decrease heat loss and increase heat production. When the body temperature is higher than normal the heat loss centre inhibits the heat gain centre activity. Impulses are sent to the skin, hair erector muscles, sweat glands and elsewhere that increase's heat loss and decrease heat production.

The roles of the skin in thermoregulation: At capillary networks, the arteriole supplying them is widened when the body needs to lose heat, but constricted when it needs to retain heat The hair erector muscles contract when heat must be retained but relax when more heat needs to be lost. The sweat glands produce sweat only when the body needs to lose more heat. Evaporation of sweat has a cooling effect. The effects on the body in high temperatures include salt loss, heat cramp and moderate and severe

dehydration. The effects on the body in low temperatures include cold injury, trench foot, frostbite, wind chill and exposure and hypothermia.

All of the above points that happen during high or low temperatures will effect how the body will perform in any situation whether its walking down the street or playing a 90 minute football match in the best league in the world. Salt loss stops the body from being effective and can make the body more at risk to catching diseases or becoming weak and unable to perform well. Heat cramp can cause long and short-term damage to muscles if not treated in the right ways in heat and can also in the long-term cause permanent damage to the muscles and joints. Dehydration on any scale will cause a decrease in performance from the human and will also cause some scale of weakness either in being unable to walk properly or even being able to do simple body functions such as breathing correctly and efficiently. Cold injury is worse than hot injury because the muscles tighten up more when cold than when warm. When warm the muscles are relaxed and smooth, whereas when the muscles are cold they are contracted and if not stretched out properly the chance of pulling the muscle is at a higher risk and the injury will be 10 times worse as in the cold it will be harder to heal than a warm injury.

Trench foot is caused when the feet get wet and cold and cause the foot to go numb resulting in cutting off of circulation to the feet. Frostbite is caused in conditions that are below freezing. Frostbite happens when the whether is below freezing and the feet are not covered and kept warm. The cold weather cuts off the circulation to the feet and causes a numb painless sensation.

When the feet get so cold and the blood in the toes and feet freeze up the blood stop circulating, so no oxygenated blood is getting into this part of the body. Frostbite also happens in the fingers and in the face. When the circulation completely stops the body part becomes black and blue and will either fall off or need to be amputated. The same effect can happen with wind chill but on the internal organs such as the heart and lungs. The cold air gets into the lungs and can slow down the breathing and make it more difficult for the casualty to get the correct amount of oxygen that's needed in the body.

Hypothermia happens when the body's core temperature drops below its normal 37 degree C. Symptoms of hypothermia include tiredness, weakness in the muscles, not being able to move or walk far, being out of breathe, collapsing suddenly when in movement. So from what I have found out thermoregulation changes dramatically from hot conditions to cold ones. Some people may have different levels of how long their bodies can last in certain climates but the bottom line is that every human is at risk to either of the above conditions. In the second part of this assignment I will be looking at altitude and water and how it affects the physiological functions of the body.

I will also be looking at how people acclimatise to certain conditions when training. Effects of high altitudeThe conditions in high mountains are difficult. They include low levels of oxygen (hypoxia), low atmospheric pressure, low temperature, low humidity, high winds and increased solar radiation.