

GUIDANCE ON THE FIRST AID MANAGEMENT FOR A SUSPENDED WORKER

Introduction:

Suspension trauma is a term used to describe the situation of a person falling into suspension in a harness and becoming unconscious.

The definition of trauma is *any body wound or shock produced by sudden physical injury, as from accident, injury, or impact*. The cause of a suspended person's unconscious state is not due to any physical injury, but is thought to be due to motionless, vertical suspension (orthostasis). The term trauma may be better replaced by the term *syncope*. The term syncope is defined as *the sudden loss of consciousness with spontaneous recovery*. A common example is when a person faints.

Basic physiology:

The human heart is not sufficiently powerful to pump the blood around the body. Gravity will *pull* blood into the legs and the heart cannot pump the blood out of the legs and back to the heart (venous pooling). The body has a different method for moving blood back out of the legs. When a person moves their legs, the muscles squeeze veins against the bones, pushing blood along. The veins have one-way valves in them which prevent the blood from returning. If a person does not move, blood will pool in the legs.

If blood pools in the legs and is not returned to the heart, the blood supply and hence the oxygen supply to the brain is reduced. This condition is referred to as "shock". The brain will attempt to rectify the situation by increasing blood pressure and pulse rate. When this fails to improve the situation the brain will use the syncope affect. By causing unconsciousness, the body should become horizontal, allowing blood to flow to the head and thus supply the brain with oxygen.

This affect can be seen with military personnel on parade. When standing motionless for long periods of time, they may pass out and collapse.

Risks of suspension:

The main problem with suspension is that the syncope reaction will not have any affect because the body cannot fall over and become horizontal.

The harness and fall arrest system that has stopped the fall, will hold the body in a near vertical position and “venous pooling” will continue in an unconscious casualty thus continuing the restriction of supply of oxygen to the brain.

First Aid advice for suspension syncope:

All muscles require a constant supply of energy. This energy is normally derived from oxygen, supplied on oxygenated blood. When blood pools in the legs, the muscles will first use up the oxygen in the blood. Once this oxygen supply has been depleted, it will not be replenished by circulating blood. The muscles will look for another energy source. Energy can be produced by burning body fat anaerobically. The anaerobic combustion of fats produces waste products, lactic acid and proteins commonly called toxins. When these are produced in high energy activity with normal circulation, they are removed from the blood by the Kidneys.

It was thought that the build up of these toxins in the pooled blood in the legs was the greatest danger to a person when released from suspension and as such the correct first aid treatment for a suspended casualty was to place them in the semi-recumbent or sitting position. The theory was to restrict the returning flow of the pooled blood back into the body. This protocol may prove dangerous through prolonging the lack of oxygen to the brain. It is thought that oxygen starvation to the brain is a greater risk to the casualty than the influx of toxins.

In 2008 the HSE undertook an evidence based review of published medical literature and has clarified guidance on the first aid management of suspended persons. The literature review revealed no documented cases of suspension trauma occurring during industrial use of fall protection.

The HSE key recommendations are:

- No change should be made to the standard first aid guidance for the post recovery of a semi-conscious or unconscious person in a horizontal position (recovery position), even if the subject of prior harness suspension.
- No change should be made to the standard UK first aid guidance of ABC management, even if the subject of prior harness suspension. +

- A casualty who is experiencing pre-syncopal symptoms or who is unconscious whilst suspended in a harness should be rescued as soon as is safely possible.
- If the rescuer is unable to immediately release a conscious casualty from a suspended position, elevation of the legs by the casualty or rescuer where safely possible may prolong tolerance of suspension.
- First responders to persons in harness suspension should be able to recognise the symptoms of pre-syncope. These include light headedness; nausea; sensations of flushing; tingling or numbness of the arms or legs; anxiety; visual disturbance; or a feeling they are about to faint. (Motionless head up suspension can lead to pre-syncope in most normal subjects within 1 hour and in a fifth within 10 minutes).

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