

SYMPTOMS:

- Hot flushes, sweating, anxiety, numbness
- Rapid pulse and breathing
- Sudden loss of consciousness (fainting)
- Death within 10-30 minutes if not rescued

SUSPENSION TRAUMA

Suspension trauma can start within 5 minutes. A fallen climber can become unconscious within 10 minutes and can die within 15. Also, anyone hanging vertically for more than 10 mins can die if they are allowed to lie down after rescue, due to the stale blood returning from their legs and stopping the heart. Suspension trauma will affect anyone hanging motionless with his or her legs dangling. No injury is needed and the harness does not need to be constrictive. It is sudden, unpredictable and always kills. It is caused by blood pooling in the legs due to gravity. Without the pump effect from leg muscles as they contract, the brain is starved of oxygen and begins to die. The only way to stop the progress is to raise the legs immediately after the fall or continually use the leg muscles. Rapid rescue is essential.

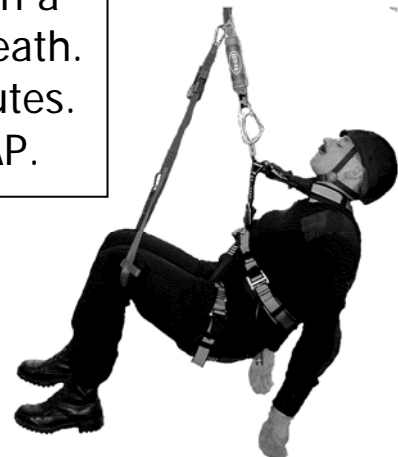
ACTIONS AFTER A FALL:

- If at all possible, recover the climber within 5-10 minutes
- If recovery is delayed, raise the knees into a sitting position **within 5 minutes**
→ If this is not possible, only raise the legs very gradually and carefully.
- If the climber is unconscious they must be reached and the airway protected
- If recovery is impossible, go for help **after** raising the knees
- During recovery, **never** allow the body to lay flat
- Keep the climber in a sitting position for at least **30 minutes**.
- Anyone who has fainted or been suspended for over 10 minutes **must** go to hospital.
→ Hand this card to the ambulance personnel when they arrive



Anyone hanging motionless in a harness is at risk of sudden death. Raise the knees within 5 minutes. Recover them to safety ASAP.

5 MINUTES



Prevention:

- Always keep legs active. Use a workseat if hanging for long periods.
- Keep hydrated and avoid smoking or alcohol
- Carry an emergency knee sling at all times
- Avoid rear-attachment if there's a risk of free-hanging after a fall
- Rescue should always be possible within 10 minutes
- Your risk assessments must plan for suspension trauma & rescue

This guidance is based on research published by the HSE and other agencies. TAG accept no liability for consequence caused by failure to comply with extant legislation and working practices.



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SUSPENSION TRAUMA

Orthostatic incompetence from harness suspension

EMERGENCY MEDICAL TREATMENT



The patient is likely to have suffered a period of significantly restricted venous return from the lower extremities leading to localised hypoxemia and symptoms of distributive shock. Postural syncope may have occurred, however with fixed vertical positioning in a harness this fails to correct the circulatory insufficiency and a carotid hypobaric response will result. Loss of life in suspension is subsequent from cerebral hypoxia. Constrictive harnesses and venous stasis may have caused limited crush injury in some cases. Hypothermia is likely and can increase cardiac fragility during rescue.

Under no circumstances must the patient be placed in a horizontal position

Venous reflow from the legs must be prevented post-rescue, or there is a likelihood of acute cardiac arrest and renal failure from localised hypoxemia and right ventricular overload. After 10 minutes of vertical immobile suspension blood in the lower extremities may be significantly chemotoxic.

The legs should be considered as for crush injury release. Even in cases reporting minor symptoms but no LOC there is a requirement for post-rescue postural management and transfer for renal monitoring. Post-recovery the patient should be maintained in a sitting position for a minimum of 30 minutes. This should override non-critical trauma management.

Prior to recovery from the harness, immediate leg-raising or muscular activity will delay onset. Beyond 5 minutes of suspension, leg-raising is counterproductive unless conducted gradually. Prior to release provide 100% oxygen and secure airway only. Do not provide fluids except to manage associated trauma. There is usually no pain so analgesia is not required however if requested avoid opiates as bradycardia is likely before or during rescue.

Immediate Treatment at Scene

- Provide 100% oxygen and secure airway for seated transport
- Minimise initial fluid therapy to that required for haemostasis
- Monitor blood glucose and correct hypoglycaemia as required
- Stabilise unrelated trauma without inducing vascular reflow
- Preserve patient in sitting position with legs maintained below the cardiac altitude
- Do not permit the patient to self-ambulate if suspension time exceeds 10 minutes
- Monitor ECG and expect sudden bradycardia or symptoms of RVF. Tachycardia is NOT indicative of haemorrhage and is to be expected, as are PVCs.

A+E Admission

- Maintain in sitting position on arrival. Minimise active lower limb exercise.
- Gradual reduction to supine position only with immediate cardiac support. Monitor for RVF.
- Catheterise and increase fluid therapy with adjuvant diuresis. Renal damage is probable for suspension times exceeding 20 minutes and dialysis should be a consideration.
- In cases where suspension times are excessive and/or harness webbing has been constrictive there is an associated issue of primary crush damage to tissues of the thighs and pelvic girdle.

This information is presented as guidance only and specific treatment protocols must be adapted for the patient and local policies. The authors base this guidance on published research and developed rescue protocols and accept no liability for application or resultant pathology. Specialist advice should be sought as required. Rescue and treatment of suspension trauma requires advanced medical skills and equipment. This is NOT First Aid. In remote areas the priority is to recover to ground, then keep the legs lowered and summon advanced aid with all possible speed.