What Happens After a Fall is Arrested? Suspension Trauma and the Importance of Having a Rescue Plan

Presented by:

Mike Kassman, Training Specialist, CPWR – The Center for Construction Research & Training

Chad Riddleberger, Captain and Technical Rescue Team Lead with Roanoke Fire-EMS, Adjunct Instructor with VA Department of Fire Programs, and Instructor with Spec Rescue International
Background

Mike Kassman
mkassman@cpwr.com
1926.503 Training Requirements

1926.503(a)(1)

- The employer shall provide a training program for each employee who might be exposed to fall hazards. The program shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to be followed in order to minimize these hazards.
Training Requirements Continued

1926.503(a)(2)

- The employer shall ensure that each employee has been trained as necessary, by a competent person who is “qualified”.
Rescue
Harness Hang Syndrome
Instructor

- Chad Riddleberger
  - Career Fire Fighter Roanoke Fire-EMS (24 years)
    - Captain / Technical Rescue Team Lead
    - Swift Water Team Coordinator
  - Virginia Department of Fire Programs
    - Adjunct Instructor Heavy Technical Rescue
    - Adjunct Instructor / Program Coordinator for Water Rescue
  - Spec Rescue International
    - Vehicle Rescue, Confined Space, Trench, Rope, Structural Collapse, Water
    - Industry and Department of Defense Training
Suspension Trauma Defined

- The rapid loss of consciousness followed by death due to inadequate circulation from motionless vertical suspension.

- Occurs from:
  - Any type of harness
  - Any type of immobilization device
  - Any other device that restricts the movement of the legs while being suspended below the heart
There are several names for the same condition:

- Orthostatic Intolerance
- Suspension Trauma
- Harness Induced Pathology
- Harness Hang Syndrome
Orthostatic Intolerance

- Standing upright with no movement of the legs
- This position produces venous pooling of blood in the legs due to gravity
- Sometimes called Parade Ground Fainting
- The effects of orthostasis appears to vary from one person to the next.
- The time it takes for symptoms to start to appear will vary between individuals.
- Test evidence shows that given sufficient time, all persons suspended in a harness will experience orthostatic shock.
What Causes Orthostatic Intolerance?

- Standing without moving your legs
- Motionless suspension in a harness
- Having the body vertical with circulation compromised
Signs and Symptoms of HHS
Signs and Symptoms

- Warning Signs
  - Faintness
  - Sweating
  - Paleness
  - Hot Flashes
  - Increased Heart Rate
  - Nausea

- Late Warning Signs
  - Dizziness
  - Unusually Slow Heart Rate
  - Unusually Low Blood Pressure
  - Greying or Loss of Vision
Additional Risk Factors

- Inability to move legs
- Pain
- Injuries during fall
- Fatigue
- Dehydration
- Hypothermia
- Shock
- Cardiovascular Disease
- Respiratory Disease
- Blood Loss
How Long Until Its an Emergency

- 5 - 30 MINUTES!!

- Unconsciousness can occur in under ONE Minute if conditions exist to exacerbate the lost blood flow to the brain. (OSHA)
If a person is working in a harness environment the employer should have the ability to lower a victim. (Per OSHA requirements)

If unable to lower the victim, or the working environment does not allow, then Suspension Trauma Relief system should deploy, even if the worker is unconscious. (OSHA)
Some movement of the legs is good. Over exertion will lead to quicker fatigue and a possible worsening of the situation.

Avoid pedaling, the excessive movements by the victim if possible.

imaginary bike!

While the bike exercise is effective often times the victim faints if pedaling stops. (HSE)
Rescue Efforts

- Lower the victim as safely as possible.
- If no additional trauma associated with the fall treat as a normal syncope pt.
- DO NOT SIT UPRIGHT!!
- The brain and heart need blood flow back!
- NS bolus for possible Kidney Complications.
- Transport to facility with suspension times documented to best of your abilities. (HSE)
Rescue and Prevention of HHS

- Be a cheerleader for conscious victims
- Provide a standing surface if possible
- Get them to a solid surface as soon as possible

Treatment
- Apply high flow oxygen
- Keep leg straps tight
- Transport promptly
What did we learn?

- Hanging motionless in a harness is a dire medical emergency.
- Any harness can cause HHS.
- The person's physical condition plays a role in the time of onset.
Death may be caused by unusual levels of toxins in the blood returning to the heart

Death can occur during or just after rescue


Solutions
1926.502(d)(19)
- Personal fall arrest systems and components subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection until inspected and determined by a competent person to be undamaged and suitable for reuse.

1926.502(d)(20)
- The employer shall provide for prompt rescue of employees in the event of a fall or shall assure that employees are able to rescue themselves.

1926.502(d)(21)
- Personal fall arrest systems shall be inspected prior to each use for wear, damage and other deterioration, and defective components shall be removed from service.
Overview of Available Solutions

Miller Relief Steps
Overview of Available Solutions

DBI Sala, Guardian and MSA
Relief Steps
Overview of Available Solutions
Rescue Ladders

3M DBI-SALA 8516294
8' Synthetic Web Rescue Ladder with Reinforced Rigid Staggered Steps, Yellow
Overview of Available Solutions

French Creek Fall Protection
Overview of Available Solutions

PRD—DBI SALA
When an employer has reason to believe that any effected employee who has already been trained does not have the understanding and skill required by paragraph (a) or (b) of this section, the employer shall retrain such employee.

Circumstances where the provision requires retraining include, but are not limited to the following situations:

1) Changes in the workplace rendering previous training obsolete; or
2) Changes in the types of fall protection systems or equipment to be used render previous training obsolete; or
3) Inadequacies in an affected employee's knowledge or use of fall protection systems equipment indicate that the employee has not retained the requisite understanding or skill.
For questions related to today’s presentation, contact:
Mike Kassman at mkassman@cpwr.com
Chad Riddleberger at rivermedic57@gmail.com

For information about Spec Rescue International, contact Larry Phillips at larry@specrescue.com or 757-468-4513
QUESTIONS?