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SUSPENSION TOLERANCE IN MEN AND WOMEN WEARING SAFETY HARNESSES.

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Workers wearing full-body safety harnesses are at risk for suspension trauma if they are not rescued in five to 30 minutes after a successfully arrested fall. Suspension trauma, which may be fatal, occurs when a person's legs are immobile in a vertical posture, leading to pooling of blood in the legs and the reduction of return blood flow to the heart. To measure suspension tolerance time, 22 men and 18 women with construction experience were suspended from the front O-ring (CHEST) and back D-ring (BACK) of full body fall-arrest harnesses. Fifteen men and 13 women were then suspended using a newly-developed NIOSH harness accessory which supports the upper legs. There were no significant gender differences in suspension time. Mean suspension times for all subjects were 24.4 ± 13.5 min (range four-60 min) and 29.2 ± 12.1 min (range five-56 min, $p < 0.05$) for the CHEST and BACK conditions, respectively. Medical symptoms were the cause of suspension termination in 69% of CHEST tests and 81% of BACK tests, while suspensions were voluntarily terminated in 28% of CHEST tests and 19% of BACK tests. One subject completed a 60-min CHEST suspension. Mid-thigh circumference changes were 1.4 and 1.9 cm ($p < 0.05$), and changes in minute ventilation were 1.2 and 1.5 L/min for CHEST and BACK, respectively. Suspension time was 57.9 ± 5.6 min (range 39–60 min) for all subjects for the harness accessory test. There were no medical symptoms during tests with the accessory, and 85% of accessory wearers completed 60-min suspensions. There were no significant changes in mid-thigh circumference or minute ventilation with the accessory. These data provide information on tolerance time for wearers of full-body harnesses for standards-setting organizations and demonstrate the potential of a harness accessory to delay or prevent suspension trauma.

Disclaimer: *"The findings and conclusions in this abstract have not been formally disseminated by the National Institute for Occupational Safety and Health and should not be construed to represent any agency determination or policy."*

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