

Effect of Head Position and Football Equipment on Cervical Spinal Cord Space  
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The purpose of this study was to assess the effect of head position and football equipment on cervical spinal cord space in individuals lying supine on a spine board. Twelve males (age =  $24.3 \pm 2.1$  yrs, height =  $181.1 \pm 5.7$  cm, weight =  $93.9 \pm 3.6$  kg) participated in this study. This study was approved by an university institutional review board and all subjects signed an informed consent prior to participation. The research design consisted of a 4 x 5 analysis of variance (ANOVA) with repeated measures. The independent variables were head position (no helmet and shoulder pads at 0, 2, and 4 cm occiput elevation; and with helmet and shoulder pads) and cervical spine level (C3, C4, C5, C6, and C7). The three dependent variables were sagittal space available for the cord (SAC) (mm), sagittal spinal cord diameter (mm), and cervical-thoracic angle (deg). MRI was performed with a TGE Signa Scanner (General Electric Medical Systems, Milwaukee, WI). The results of the study revealed that SAC was significantly greater ( $p < .01$ ) for 0 cm (mean = 5.50 mm) than for 2 cm (mean = 4.86 mm) and 4cm (mean = 5.07 mm). SAC was also significantly greater ( $p < .01$ ) for the pads condition (mean = 5.34 mm) when compared to 2 cm and 4 cm. There was no significant difference ( $p = .093$ ) in SAC between 0 cm and the pads condition. The mean cervical-thoracic angle for 0 cm and the pads condition were 22.9 degrees and 18.1 degrees, respectively. The results of this study support the previous literature which maintains that the helmet and shoulder pads should be left on during the spine board immobilization of the injured football player. Similarly, during immobilization of an athlete without football helmet and shoulder pad, the head should not be elevated as SAC was greater at 0 cm than 2 or 4 cm of occiput elevation. However, further research should be done to examine the entire cross-sectional area of the cord while lying supine in varying head positions and wearing football equipment.