

*ABSTRACT*

## **The effects of neutral positioning with and without padding on spinal immobilization of healthy subjects.**

**Lerner EB, Billittier AJ 4<sup>th</sup>, Moscati RM.**

Department of Emergency Medicine, School of Medicine and Biomedical Sciences, State University of New York at Buffalo 14215, USA. [lerner@acsu.buffalo.edu](mailto:lerner@acsu.buffalo.edu)

**OBJECTIVES:** To compare the incidences and severities of pain experienced by healthy volunteers undergoing spinal immobilization in the neutral position with and without occipital padding. To compare the incidence of pain when immobilized in the neutral position with the incidence in a non-neutral position.

**METHODS:** Thirty-nine healthy volunteers over the age of 18 years who had no acute pain or illness, were not pregnant, and had no history of back problems or surgery voluntarily participated in a prospective, randomized, crossover study conducted in a clinical laboratory setting. Appropriately sized rigid cervical collars were applied to the subjects, who were then immobilized on wooden backboards with their cervical spines maintained in the neutral position using towels (padded) or plywood (unpadded) under their occiputs. The subjects were secured to the board with straps, soft head blocks, and tape for 15 minutes to simulate a typical ambulance transport time. The straps, head blocks, and tape were removed, and the subjects remained on the board for an additional 45 minutes to simulate a typical emergency department experience. The subjects were then asked to identify the location(s) of any pain or anterior and posterior body outlines and to indicate the corresponding severity of pain on a 10-cm visual analog scale. The subjects were also asked questions about movement, respiratory symptoms, and strap discomfort in an attempt to distract them from the true focus of the study (i.e., pain). A similar survey was given to each participant a complete 24 hours later. The same subjects were immobilized with the alternate occipital material a minimum of two weeks later utilizing the same procedure. They again completed both surveys.

**RESULTS:** Pain was reported by 76.9% of the subjects following removal from the backboard for the unpadded trial and 69.2% of the subjects following the padded trial ( $p < 0.45$ ). Twenty-three percent (23.1%) of the subjects reported neck pain after the unpadded trial, while 38.5% reported neck pain after the padded trial ( $p < 0.07$ ). Occipital pain was reported by 35.9% in the unpadded trial and 25.6% in the padded trial ( $p < 0.29$ ). Twenty-four hours later, pain was reported by 17.9% of the subjects following the unpadded trial and 23.1% of the subjects following the padded trial ( $p < 0.63$ ). Eight percent (7.7%) reported neck pain 24 hours after the unpadded trial and 12.8% after the padded trial ( $p < 0.5$ ). Occipital pain was reported by 7.7% of the subjects 24 hours after the unpadded trial and 2.6% after the padded trial ( $p < 0.63$ ). This study had a power of 0.90 to detect a difference of 30% between the trials. The authors found a significantly lower incidence of pain ( $p < 0.01$ ) and occipital pain ( $p < 0.01$ ) in their unpadded trial compared with that reported by Chan et al., who used neither padding nor neutral positioning to immobilize subjects.

**CONCLUSIONS:** Pain is frequently reported by healthy volunteers following spinal immobilization. Occipital padding does not appear to significantly decrease the incidence or severity of pain. Alignment of the cervical spine in the neutral position may reduce the incidence of pain, but further studies should be conducted to substantiate this observation.

Prehosp Emerg Care 1998 Apr-Jun; 2(2):112-6