Objective: To assess the peak interface pressures for the head, scapulothoracic (S-T), sacrogluteal (S-G) and heel regions on two different spine boards: standard spine board (SSB) and spine board prototype (P-3) during spinal immobilization.

Design: Prospective Study

Participants/Methods: Ten healthy, able-bodied subjects were evaluated. Height, weight, and sex was recorded pre-study. Pain score for each body region was recorded post-study. A SSB was modified with cut-outs and foam inserts to produce P-3. Each subject was placed in a supine position on the SSB and P-3 spine board with arms strapped across the chest and feet strapped together. The FSA Boditrak pressure mapping system was used to monitor interface pressure at the head, S-T, S-G and heel regions in each subject on both SSB and P-3. Measurements were recorded every minute for 15 minutes. Repeated Measures ANOVA was used to test the differences in mean peak pressures produced on the SSB and the P-3 and paired t-test was used to assess difference in pain level between the two boards at each region.

Results: Results: Ten subjects were assessed on each board. The mean age was 28.8 years, mean weight was 170.6 lb, mean height was 69 in., and mean BMI was 25.1.

Using a Repeated Measures ANOVA statistical method; compared to the SSB, the P-3 produced statistically lower mean peak pressures on the body regions of head (227.2 mmHg vs. 96.7 mmHg, F=69.4, p <.001), S-G (372.7 mmHg vs. 114.2 mmHg, F=41.6, p <.001), and heel (288.9 mmHg vs. 69.1 mmHg, F=17.4, p =.002). There were no significant differences found for the S-T body region, which is consistent with where the inserts were not located. Subjects rated pain at a significantly lower level on P-3 compared to SSB at the head (2.20 vs. 0.60, t= 2.954, p = 0.016) and S-G (2.40 vs. 0.30, t=2.849, p=0.019) regions.

Conclusion: Modification of a spine board with cut-outs and foam inserts can dramatically reduce interface pressures at common sites of pressure ulcer formation during spine board immobilization. Additionally, pain can also be reduced over pressure sensitive areas to improve comfort while being strapped to the spine board.

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