Padded vs Unpadded Spine Board for Cervical Spine Immobilization.

Walton R, DeSalvo JF, Ernst AA, Shahane A  
Department of Medicine, Louisiana State University, New Orleans, USA.

OBJECTIVES: To determine whether padding the long spine board improves patient comfort, affects cervical spine (c-spine) immobilization, or increases sacral transcutaneous O2 tension.

METHODS: A prospective randomised, controlled crossover study of healthy volunteers was conducted over a two-week period. Participants included 30 volunteers with no previous history of c-spine injury or disease.

The subjects were randomised to either padded or unpadded long spine board immobilization with serial measurements of discomfort (using a visual analogue scale) and transcutaneous tissue O2 tension obtained at zero and 30 minutes. Measurements of ability to flex, extend, rotate, and laterally bend the c-spine were made using a goniometer. The subjects then returned a minimum of three days later to complete the opposite half of the study (padded vs unpadded boards).

RESULTS: Subject discomfort was significantly reduced in the padded group compared with the unpadded group (p = 0.024). There was no significant difference in flexion (p = 0.410), extension (p = 0.231), rotation (p = 0.891), or lateral bending (p = 0.230) for the two groups. There was no significant difference in the actual drop in sacral transcutaneous O2 tension from time zero to 30 minutes for the padded and the unpadded groups (mean drop = 14.8% +/- 17.5% vs 12.2% +/- 16.8%, respectively; p = 0.906).

CONCLUSION: Adding closed-cell foam padding to a long spine board significantly improves comfort without compromising c-spine immobilization.

Sacral tissue oxygenation does not appear affected by such padding for healthy volunteers.
Pain and Tissue-Interface Pressures During Spine-Board Immobilization.

Cordell WH, Hollingsworth JC, Olinger ML, Stroman SJ, Nelson DR
Emergency Medicine and Trauma Center, Methodist Hospital of Indiana, Indianapolis, USA.

STUDY OBJECTIVES: Although spine boards are one of the main EMS means of immobilization and transportation, few studies have addressed the discomfort and potential harmful consequences of using this common EMS tool. We compared the levels of pain and tissue-interface (contact) pressures in volunteers immobilized on spine boards with and without interposed air mattresses.

DESIGN: Prospective crossover study.

SETTING: Emergency department of Methodist Hospital of Indiana, Indianapolis, Indiana.

PARTICIPANTS: Twenty healthy volunteers who had not taken any analgesic drugs in the preceding 24 hours, were not experiencing any pain at the time of the study, and did not have history of chronic back pain.

INTERVENTIONS: To simulate pre-hospital transport conditions, we immobilized volunteers with hard cervical collars and single-buckle chest straps on wooden spine boards with or without commercially available medical air mattresses. The crossover order was randomised.

After 80 minutes, immobilization measures were discontinued and the subjects were allowed to get off the boards for a recovery period of 60 minutes. Subjects were then studied for a second 80-minute period with the opposite intervention. At baseline and at 20-minute intervals, the level of pain was rated with a 100-mm visual analogue scale. Tissue-interface pressures were measured at the occiput, sacrum, and left heel.

RESULTS: Mean pain on the visual analogue scale was 9.7 mm at the end of the mattress period and 37.5 mm at the end of the no-mattress period (P = .0001). Although there were no significant differences in pain between the two groups at time 0, volunteers reported significantly more pain during the no-mattress period at 20 (P = .003), 40 (P = .0001), and 60 minutes (P = .0001). All 20 subjects reported that immobilization on the spine board with the mattress was "much better" (five-point scale) than that without the mattress. Interface pressure levels were significantly less in the mattress period than in the no-mattress period measured at occiput (P = .0001), sacrum (P = .0001), and heel (P = .0001).

CONCLUSION: In a simulated immobilization experiment, healthy volunteers reported significantly less pain during immobilization on a spine board with an interposed air mattress than during that on a spine board without a mattress. Tissue-interface pressures were significantly higher on spine boards without air mattresses. This and previous studies suggest that immobilization on rigid spine boards is painful and may produce tissue-interface pressure high enough to result in the development of pressure necrosis ("bedsores"). Emergency care providers should consider the use of interposed air mattresses to reduce the pain and potential tissue injury associated with immobilization on rigid spine boards.
Reduced Tissue-Interface Pressure and Increased Comfort on a Newly Developed Soft-Layered Long Spineboard

Hemmes, Baukje MSc; Poeze, Martijn MD, PhD; Brink, Peter R. G. MD, PhD

Background: Immobilization of the spine in patients with trauma at risk of spinal damage is performed using a rigid long spine board or vacuum mattress both during pre-hospital and in-hospital care.

However, disadvantages of these immobilization devices in terms of discomfort and tissue-interface pressures have guided the development of a new soft-layered long spine board. We compared tissue-interface pressure and degree of discomfort during immobilization on a rigid spine board, a vacuum mattress, and a newly developed soft-layered long spine board.

Methods: In this randomized crossover trial, 30 volunteers were immobilized sequentially on all three devices for 15 minutes per device. Tissue-interface pressures were measured using an Xsensor pressure mapping device, including the peak pressure and the Peak Pressure Index (PPI). Discomfort was rated on a Visual Analogue Scale after 1 minute and after 15 minutes of immobilization.

Results: Tissue-interface pressures were significantly higher on the standard long spine board and the vacuum mattress than on the soft-layered long spine board. PPI for the sacrum was close to peak pressure on both the spine board and the vacuum mattress. PPI for the sacrum on the soft-layered long spine board was significantly lower, with an average PPI close to normal diastolic blood pressures. The participants reported significantly less discomfort on the soft-layered long spine board compared with the rigid long spine board, both after 1 minute and 15 minutes (p < 0.0001).

Conclusions: This study revealed a relevant reduction in tissue-interface pressures and discomfort when using a soft-layered long spine board compared with using a standard rigid long spine board or a vacuum mattress. Emergency care providers should consider the use of the soft-layered long spine board to reduce the discomfort and potential tissue damage caused by immobilization and transport on a rigid long spine board or vacuum mattress.
BACKGROUND: The development of a pressure ulcer is of great significance to the life-long rehabilitative management of the person with a spinal cord injury, and may indeed delay and repeatedly interfere with that process. That the period preceding admission to the specialized spinal injury unit is crucial with regard to pressure ulcer development is evident in the professional literature.

Both anecdotal and empirical evidence indicates that a significant number of pressure ulcers occur as a result of management provided prior to admission, and that such ulcers are more likely to occur in those patients who have undergone a transfer process from a hospital distal to the specialist unit on a hard spinal board.

AIM: In consideration of this and of the fact that, in Ireland, the inter hospital transfer of spinal injured patients has usually involved the employment of such spinal boards to achieve immobilization, this study sought to identify whether or not the pressure experienced by individuals at two anatomical locations was dependent on the support surface employed.

METHODOLOGY: Pressure under the occiput and sacrum of three healthy volunteers immobilized on three support surfaces was measured using air-filled pressure-measuring sacks. The surfaces employed were an unpadded spinal board; a spinal board with inflatable raft devise; and a full-body vacuum splint.

DISCUSSION: Marked reductions in pressure were measured when using the inflatable raft and the vacuum mattress. The results of this study will provide a basis for a larger study and, through that, the formulation of recommendations for standardized practice along a national care pathway.
Efficacy of an Inflatable Spine-Board Padding Device In Reducing Pain During Simulated Spinal Immobilization

Jamie Treseder, MD and Steven M. Joyce, MD
Division of Emergency Medicine, University of Utah School of Medicine

STUDY OBJECTIVES: Rigid Spine boards, in combination with other devices, are commonly used for spinal immobilization of trauma victims by EMS services. Research indicates that victims spend an average of 60 minutes immobilized, from scene to ED clearance of the spine.

Prolonged immobilization has been shown to cause pain, which may prompt unnecessary x-rays. Padding devices have been shown to decrease pain in immobilized volunteers. The use of a verbal analogue scale to rate pain has been validated. This study investigated the efficacy of a commercially available, disposable, inflatable spine-board padding device (IPD) in reducing pain due to spinal immobilization in normal healthy volunteers.

DESIGN: Prospective randomized crossover study.

SETTING: Non-clinical, EMS laboratory setting.

PARTICIPANTS: Twenty-five healthy adult volunteers without acute or chronic back pain and not having used analgesics in the preceding 24 hours.

METHODS/INTERVENTIONS: Two trials were performed on each subject, with and without the IPD (BackRaftTM, MedicTech Inc.), with each subject acting as his/her own control. Volunteers were immobilized using rigid cervical collars, spine boards, head immobilizers and straps. Immobilization was performed by experienced paramedics and the investigators, using standardized methods and the manufacturer’s instructions for application of the IPD.

The order of the two trials was randomized, and timed at least 48 hours apart. Volunteers were immobilized for 60 minutes. A verbal analogue scale (VAS) was used to assess pain, with subjects asked to rate their pain on a scale of 0 to 10, with 10 being most severe. A pain assessment was obtained immediately pre-immobilization and every 15 minutes until 15 minutes after immobilization was discontinued. The difference between pain ratings with and without the IPD was calculated for each participant at each time interval.

The mean difference in pain ratings for each time interval was then compared to zero using a paired two tailed t-test. Results were considered statistically significant at p < 0.05. Research suggests that a difference of >1.3 units on a 0-10 unit VAS indicates clinically significant pain relief.6 Mean differences with lower 95% confidence intervals > 1.3 were thus considered clinically significant. Subjects were examined for physical injury 15 minutes after immobilization was discontinued.
Reductions in mean pain scores with the **IPD** at 15 through 60 minutes were **statistically significant**. Mean scores at 45 and 60 minutes met the criterion for clinical significance. None of the victims had significant physical injury.

**CONCLUSIONS:** Healthy volunteers reported statistically significant reduction in pain at 15 through 60 minutes when an IPD was used during spinal immobilization. Using a criterion of >1.3 units on a VAS, reduction in pain at 45 and 60 minutes was also clinically significant. The **IPD was effective in decreasing discomfort** during spinal immobilization in healthy volunteers. Clinical studies in immobilized trauma victims are indicated.
Long Spine Board: Does It Cause Discomfort?

Anthony Hann - MICA Paramedic
Ambulance Officers Training Centre, Victoria, Australia

In recent times, the flat Long Spine Board (FLSB) has come under increasing scrutiny due to the potential discomfort and pressure area development of the FLSB to the patient when the patient is immobilised without body, head or lumbar padding. Additionally respiratory compromise due to the strapping techniques in use have also been quoted.

It has been suggested by some studies however that the addition of appropriate padding under the patient can improve comfort and reduce tissue interface pressures.

The Victorian Ambulance Service introduced the curved Long Spine Board (CLSB) into use in 1995, and since then, there have been no studies within the Service to support or discredit previous overseas studies on the FLSB discomfort, pressure area development or respiratory compromise.

To resolve this question, a study was carried out at the Ambulance Officers Training College in Victoria to determine if the CLSB and methods being taught by the Victorian Ambulance Service resolved previous discomfort findings.

Method: In this study, 16 healthy subjects (Stage 1 Ambulance Students) without a previous history of back injury and no current back pain were placed onto the fibreglass CLSB for a period of 60 minutes with padding as per the Victorian Ambulance Service’s teaching standards (Worksheet Instructions 5.1.11)

Results: Subjects stated the CLSB padded as per the Victorian Ambulance Service’s teaching (Worksheet Instructions 5.1.11) to be comfortable to lay on for a period of 1 hour, twice the period stated in the Chan study where no padding was applied.

Symptoms generated by the Chan study were significantly reduced in this study. Headaches and pressure areas as stated in Chan study did not develop.

Subjects further stated head discomfort was related to the cervical collar, which was agreed by subjects to be the major cause of the overall discomfort rating.

Conclusion: The CLSB with correct padding and immobilisation techniques as currently being taught by the Victorian Ambulance Service’s teaching standards using Worksheet Instructions 5.1.11 is comfortable for at least 1 hour on the healthy subject.

For more information read on....
INTRODUCTION

In recent times, the flat Long Spine Board (FLSB) has come under increasing scrutiny due to the potential discomfort and pressure area development of the FLSB to the patient when the patient is immobilised without body, head or lumbar padding.\textsuperscript{1-6}

Additionally respiratory compromise due to the strapping techniques in use have also been quoted.\textsuperscript{7-8} It has been suggested by some studies however that the addition of appropriate padding under the patient can improve comfort and reduce tissue interface pressures.\textsuperscript{2-6}

The Victorian Ambulance Service introduced the curved Long Spine Board (CLSB) into use in 1995, and since then, there have been no studies within the Service to support or discredit previous overseas studies on the FLSB discomfort, pressure area development or respiratory compromise.\textsuperscript{1-8}

To resolve this question, a study was carried out at the Ambulance Officers Training College in Victoria to determine if the CLSB and methods being taught by the Victorian Ambulance Service\textsuperscript{9} resolved previous discomfort findings.

METHOD

Sixteen healthy subjects (Stage 1 Ambulance Students) without a previous history of back injury and no current back pain were placed onto the fiberglass CLSB for a period of 1 hour with padding as per the Victorian Ambulance Service’s teaching standards using Worksheet Instructions 5.1.11\textsuperscript{9} using a blanket between the patient and CLSB, occipital padding with a bath towel, and lumber support using an Airsplint (Hand & Wrist).
Fourteen of the subjects were then immobilised to the CLSB as per the Victorian Ambulance Service’s teaching standards using Worksheet Instructions 5.1.11 with chest crossover straps, pelvic strap, femur strap, and figure of eight foot strap.

Two subjects received no immobilisation. All patients had a cervical collar applied using either Stifneck, Veribrace or Wizloc collars. Nine of the subjects received head blocks with forehead and collar taping padding again as per the Victorian Ambulance Service’s teaching standards using Worksheet Instructions 5.1.11, and 6 subjects received no additional head immobilization.

Subjects were checked every 15 minutes by fellow students and asked to rate discomfort in numerous areas of the immobilisation, which was measured using the 10 point numerical rating scale (NRS) of 0 (no pain) to 10 (significant pain). Overall discomfort and comfort were also measured.

**RESULTS**

The following are the recorded results of the 16 subjects.

**Cervical Collar Discomfort**

All 16 subjects were fitted cervical collars using one of the following brands - Laerdal Stifneck (4), Zimmer Vertibrace (3) or Ferno Wizloc (1) cervical collars. Eight of the subjects failed to state on the evaluation form what brand of cervical collar was used. During the 1 hour session, 1 subject required the removal of the cervical collar due to significant discomfort. Subjects were asked to rate cervical collar discomfort during immobilisation, measured with the NRS of 0 (no pain) to 10 (significant pain), with results shown in Table 1 below.

<table>
<thead>
<tr>
<th>TIME</th>
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</tr>
</thead>
<tbody>
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</tr>
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<td>1.8</td>
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<td>45 Min</td>
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<tr>
<td>60 Min</td>
<td>0</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Table 1

*R = Collar  R = Removed

The cervical collar was stated by the majority of subjects to be the major cause of pain during the study.
Long Spine Board: Does It Cause Discomfort?
Continued…

S Spine Board Discomfort

Previous studies have shown pain and discomfort when lying on the FLSB for periods of greater than 30 minutes when inadequate or no padding is applied.\textsuperscript{1-5}

All 16 subjects were placed on the CLSB for a period of 1 hour. As per the Victorian Ambulance Service’s teaching standards using Worksheet Instructions 5.1.11,\textsuperscript{9} patients were placed on the CLSB using a folded blanket between the patient and CLSB, occipital padding with a bath towel, and lumber support using an Airsplint (Hand & Wrist).

Subjects were asked to rate discomfort during immobilisation, measured with the NRS of 0 (no pain) to 10 (significant pain), with results shown in Table 2 below.

<table>
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</tr>
<tr>
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<td>1</td>
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<td>0</td>
<td>0</td>
<td></td>
<td>0.5</td>
</tr>
</tbody>
</table>

Table 2
Head Occiput Discomfort

Failure to pad under the occiput has been shown to cause pain and discomfort when lying on the FLSB for periods of greater than 30 minutes,¹ and may result in misalignment of the cervical spine.¹¹-¹²

To maintain neutral inline positioning of the cervical spine, padding was placed under the occiput of the patient’s head as per the Victorian Ambulance Service’s teaching standards using Worksheet Instructions 5.1.11.⁹ Subjects were asked to rate head occiput discomfort during immobilisation, measured with the NRS of 0 (no pain) to 10 (significant pain), with results shown in Table 3 below.

<table>
<thead>
<tr>
<th>TIME</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>6</th>
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<td>0</td>
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<td>0.5</td>
</tr>
<tr>
<td>45 Min</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
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<td>1</td>
<td>3</td>
<td>2</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Table 3

The majority of the subjects complaining of pain stated this to be due to the cervical collar.
Long Spine Board: Does It Cause Discomfort? Continued…

Lumbar Discomfort

Previous studies have shown that inadequate or no padding under the lumbar spine can lead to pain and discomfort when lying on the FLSB for periods of greater than 30 minutes.¹,⁶

To maintain anatomical alignment of the lumbar spine, padding was placed under the lumbar spine using an air splint (hand and wrist) as per the Victorian Ambulance Service’s teaching standards using Worksheet Instructions 5.1.11.⁹

Subjects were asked to rate lumbar spine discomfort during immobilisation, measured with the NRS of 0 (no pain) to 10 (significant pain), with results shown in Table 4 below.

<table>
<thead>
<tr>
<th>TIME</th>
<th>SUBJET</th>
<th>MEAN RESULT</th>
</tr>
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<tbody>
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<td>0.9</td>
</tr>
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<td>0.8</td>
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<td>45 Min</td>
<td>0 0 0 1 2 1 2 0 0 0 1 0 0 1 0 2</td>
<td>0.6</td>
</tr>
<tr>
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<td>1.0</td>
</tr>
</tbody>
</table>

Table 4
Long Spine Board: Does It Cause Discomfort?  
Continued…

Chest Cross Strap Discomfort

Previous studies have recommended the use of cross over shoulder straps in preventing upward sliding as well as limiting lateral movement of the torso of the patient during transport.\textsuperscript{10}

Fourteen of the 16 subjects were immobilised to the CLSB using cross over straps as per the Victorian Ambulance Service’s teaching standards using Worksheet Instructions 5.1.11.\textsuperscript{9}

Subjects were asked to rate chest cross strap discomfort during immobilisation, measured on a NRS of 0 (no pain) to 10 (significant pain), with results shown in Table 5 below.

<table>
<thead>
<tr>
<th>TIME</th>
<th>SUBJECT</th>
<th>MEAN RESULT</th>
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<tr>
<td>60 Min</td>
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</tbody>
</table>

Table 5

Respiratory Compromise

Previous studies have demonstrated respiratory restrictions when applying chest straps.\textsuperscript{7-8}

Subjects were asked to rate respiratory restrictions during immobilisation, measured on a NRS of 0 (no restriction) to 10 (significant restriction), with results shown in Table 6 below.

<table>
<thead>
<tr>
<th>TIME</th>
<th>SUBJECT</th>
<th>MEAN RESULT</th>
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</table>

Table 6
Long Spine Board: Does It Cause Discomfort?  
Continued…

Pelvic Strap Discomfort

The pelvic strap is applied to assist in preventing lateral movement of the spinal column. Fourteen of the 16 subjects had pelvic straps applied as per the Victorian Ambulance Service’s teaching standards using Worksheet Instructions 5.1.11. 9

Subjects were asked to rate pelvic strap discomfort during immobilisation, measured on a NRS of 0 (no pain) to 10 (significant pain), with results shown in Table 7 below.

<table>
<thead>
<tr>
<th>TIME</th>
<th>SUBJECT</th>
<th>MEAN RESULT</th>
</tr>
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<tr>
<td>60 Min</td>
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<td>0.0</td>
</tr>
</tbody>
</table>

Table 7

Femur Strap Discomfort

The femur strap is applied to assist in preventing lateral movement of the spinal column. Fourteen of the 16 subjects had femur straps applied as per the Victorian Ambulance Service’s teaching standards using Worksheet Instructions 5.1.11. 9

Subjects were asked to rate femur strap discomfort during immobilisation measured on a NRS of 0 (no pain) to 10 (significant pain) with results shown in Table 8 below.

<table>
<thead>
<tr>
<th>TIME</th>
<th>SUBJECT</th>
<th>MEAN RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 Min</td>
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</tr>
<tr>
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<td>0.0</td>
</tr>
<tr>
<td>45 Min</td>
<td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0.5</td>
<td>0.0</td>
</tr>
<tr>
<td>60 Min</td>
<td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Table 8
Long Spine Board: Does It Cause Discomfort? Continued…

Ankle Strap Discomfort

The use of the figure of eight ankle strap prevents downward sliding of the patient and assists in limiting lateral movement of the spinal column during transport.\textsuperscript{14}

Fourteen of the 16 subjects had a figure of eight ankle strap applied as per the Victorian Ambulance Service’s teaching standards using Worksheet Instructions 5.1.11.\textsuperscript{9}

Subjects were asked to rate ankle strap discomfort during immobilisation, measured on a NRS of 0 (no pain) to 10 (significant pain), with results shown in Table 9 below.

<table>
<thead>
<tr>
<th>TIME</th>
<th>SUBJECT</th>
<th>MEAN RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1  2  3</td>
<td></td>
</tr>
<tr>
<td>15 Min</td>
<td>0  0  2</td>
<td></td>
</tr>
<tr>
<td>30 Min</td>
<td>0  0  2</td>
<td>0.4</td>
</tr>
<tr>
<td>45 Min</td>
<td>0  0  3</td>
<td>0.3</td>
</tr>
<tr>
<td>60 Min</td>
<td>0  0  3</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Table 9

No padding was placed between the patients legs in this study. This needs to be evaluated to determine if this would reduce discomfort.

Head Block Discomfort

The use of head blocks and tape has shown significant improvement of cervical spine immobilisation over cervical collar alone.\textsuperscript{15-17} Nine of the 16 subjects received head immobilisation using foam head blocks and tape applied as per the Victorian Ambulance Service’s teaching standards using Worksheet Instructions 5.1.11.\textsuperscript{9}

Subjects were asked to rate head block discomfort during immobilisation, measured on a NRS of 0 (no pain) to 10 (significant pain), with results shown in Table 10 below.

<table>
<thead>
<tr>
<th>TIME</th>
<th>SUBJECT</th>
<th>MEAN RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1  2  3</td>
<td></td>
</tr>
<tr>
<td>15 Min</td>
<td>0  0  2</td>
<td>0.2</td>
</tr>
<tr>
<td>30 Min</td>
<td>1  0  0</td>
<td>0.3</td>
</tr>
<tr>
<td>45 Min</td>
<td>0  0  0</td>
<td>0.2</td>
</tr>
<tr>
<td>60 Min</td>
<td>0  0  0</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Table 10
Long Spine Board: Does It Cause Discomfort?  
Continued…

**Head Tape Discomfort**

As stated above, the use of head blocks and tape has shown significant improvement of cervical spine immobilisation over cervical collar alone.\textsuperscript{15-17}

Ten of the 16 subjects received head immobilisation using tape applied as per the Victorian Ambulance Service’s teaching standards using Worksheet Instructions 5.1.11.\textsuperscript{9}

Subjects were asked to rate head tape discomfort during immobilisation, measured on a NRS of 0 (no pain) to 10 (significant pain), with results shown in Table 11 below.

<table>
<thead>
<tr>
<th>TIME</th>
<th>SUBJECT</th>
<th>MEAN RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 Min</td>
<td>0 1 2 2 1 0 1 0 2 0</td>
<td>0.9</td>
</tr>
<tr>
<td>30 Min</td>
<td>0 0 3 2 1 0 1 0 2 0</td>
<td>0.9</td>
</tr>
<tr>
<td>45 Min</td>
<td>0 0 2 0 1 0 1 0.5 1 0</td>
<td>0.6</td>
</tr>
<tr>
<td>60 Min</td>
<td>0 0 2 0 0 0 3 0.5 1 3</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Table 11

**Overall Discomfort**

Immobilisation of all multi trauma patients to a LSB is the recommendation of the Victorian Ministerial Task Force on Trauma.\textsuperscript{18}

Subjects were asked to rate overall discomfort of full spine immobilisation when the Victorian Ambulance Service’s teaching standards using Worksheet Instructions 5.1.11\textsuperscript{9} were followed.

Subjects were asked to rate overall discomfort during immobilisation, measured on a NRS of 0 (no pain) to 10 (significant pain), with results shown in Table 12 below.

<table>
<thead>
<tr>
<th>TIME</th>
<th>SUBJECT</th>
<th>MEAN RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 Min</td>
<td>0 3 3 1 1 0 1 0 1 0 0 0 0 0 2 0 0</td>
<td>0.8</td>
</tr>
<tr>
<td>30 Min</td>
<td>0 4 0 1 2 0 1 0 1 0 0 0 0 0 2 0 0</td>
<td>0.7</td>
</tr>
<tr>
<td>45 Min</td>
<td>0 1 3 1 2 2 1 1 0 0 0 0 2 0 1 1 0</td>
<td>1.0</td>
</tr>
<tr>
<td>60 Min</td>
<td>0 1 3 3 3 2 2 1 2 0 0 0 0 0.5 3 3 1</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Table 12
Long Spine Board: Does It Cause Discomfort?

Continued…

Overall Comfort

With immobilisation of all multi trauma patients to a LSB being the recommendation of the Victorian Ministerial Task Force on Trauma, subjects were asked to rate overall comfort of full spine immobilisation when the Victorian Ambulance Service’s teaching standards using Worksheet Instructions 5.1.11 were followed.

Subjects were asked to rate overall comfort during immobilisation, measured on a NRS of 0 (uncomfortable) to 10 (excellent), with results shown in Table 13 below.

Only 12 subjects rated the comfort scale using the NRS 0 to 10 rating system. Four subjects used the poor to excellent scale. Only the NRS 0 to 10 figures are used in the mean score.

<table>
<thead>
<tr>
<th>TIME</th>
<th>SUBJECT</th>
<th>MEAN RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 Min</td>
<td>V A G 9 9 8 8 9 10 9 8 G G 9 5</td>
<td>8.4</td>
</tr>
<tr>
<td>30 Min</td>
<td>V A G 9 8 8 8 9 10 9 8 E G 9 5</td>
<td>8.3</td>
</tr>
<tr>
<td>45 Min</td>
<td>V G A 8 8 7 8 9 10 9 9 G E 7 5</td>
<td>8.3</td>
</tr>
<tr>
<td>60 Min</td>
<td>V G A 7 7 8 8 8 9 9 G G 7 5</td>
<td>7.5</td>
</tr>
</tbody>
</table>

Table 13

*A = Average
*G = Good
*V = Very Good
*E = Excellent

DISCUSSION

A number of recent studies have recorded improvement in comfort and a reduction of tissue interface pressures of the FLSB when appropriate padding is applied.2-6

In this study, subjects stated the CLSB padded as per the Victorian Ambulance Service’s teaching standards using Worksheet Instructions 5.1.11 to be comfortable to lay on for a period of 1 hour, twice the period stated in a previous study where no padding was applied.1

Symptoms generated by the previous study1 were significantly reduced in this study. Headaches and pressure areas as stated in the previous study1 did not develop.

Subjects further stated head discomfort was related to the cervical collar, which was agreed by subjects to be the major cause of the overall discomfort rating.
Long Spine Board: Does It Cause Discomfort? 
Continued…

CONCLUSION

The CLSB with correct padding and immobilisation techniques as currently being taught by the Victorian Ambulance Service’s teaching standards using Worksheet Instructions 5.1.11\(^9\) is comfortable for at least 1 hour on the healthy subject.
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