



**Title: Scoop Stretcher for Restriction of Spinal Motion: Clinical Effectiveness**

**Date:** 28 May 2008

**Research question:**

What is the evidence for the clinical effectiveness of a scoop stretcher to restrict spinal motion of a patient with a spinal injury in a pre-hospital setting?

**Methods:**

A limited literature search was conducted on key health technology assessment resources, including PubMed, the Cochrane Library (Issue 2, 2008), University of York Centre for Reviews and Dissemination (CRD) databases, ECRI, EuroScan, international HTA agencies, and a focused Internet search. Results include articles published between 2003 and May 2008, and are limited to English language publications only. No filters were applied to limit the retrieval by study type. Internet links are provided, where available.

The summary of findings was prepared from the abstracts of the relevant information.

**Results:**

HTIS reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews and meta-analyses are presented first. These are followed by randomized controlled trials (RCTs), and observational studies.

One observational study was identified pertaining to the clinical effectiveness of the scoop stretcher to restrict spinal motion of a patient with a spinal injury in a pre-hospital setting. No relevant health technology assessments or RCTs were identified. A systematic review of the effects of spinal immobilization was identified, but it was unclear as to whether or not the scoop stretcher was examined. This systematic review, along with other references that may be of interest, has been included in the Appendix.

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## Overall summary of findings:

The only observational study identified compared the use of the Ferno Scoop™ Stretcher (FSS) (Model 65-EXL) with the traditional long back board (LBB).<sup>1</sup> Thirty-one adult subjects were fitted with electromagnetic sensors over the forehead and on both the C3 and T12 spinous processes. Participants were placed in a rigid cervical collar and movement was recorded using a motion analysis system. Sagittal flexion, lateral flexion, and axial rotation were measured at baseline, application of the device (logroll onto the LBB or placement of the FSS around the patient), during secured logroll maneuver, and during lifting. Comfort and perceived security were measured on a visual analog scale. Sagittal, lateral and axial plane motion were 6 to 8 degrees greater during the application of the LBB when compared with the FSS ( $p < 0.001$ ) whereas the lifting produced more sagittal flexion with the FSS when compared with the LBB ( $p < 0.001$ ). No difference was found during the secured logroll. The FSS provided superior comfort and perceived security. The authors concluded that the decreased movement provided by the use of the FSS may reduce the risk of further spinal cord injury.

There is limited evidence for the clinical effectiveness of a scoop stretcher to restrict spinal motion of a patient with a spinal injury in a pre-hospital setting. Additionally, it is unclear as to whether the subjects studied in the FSS study were trauma patients or healthy volunteers.<sup>1</sup> Also of note; the systematic review identified in the Appendix relied on RCTs of healthy subjects and urges comparisons of immobilization techniques on trauma patients in order to establish an evidence base for clinical practice.<sup>2</sup>

## References summarized:

### Health technology assessments

No literature identified

### Systematic reviews and meta-analyses

No literature identified

### Randomized controlled trials

No literature identified

### Observational studies

1. Krell JM, McCoy MS, Sparto PJ, Fisher GL, Stoy WA, Hostler DP. Comparison of the Ferno Scoop Stretcher with the long backboard for spinal immobilization. *Prehosp Emerg Care* 2006;10(1):46-51. [PubMed: PM16418091](#)

**OBJECTIVES:** Spinal immobilization is essential in reducing risk of further spinal injuries in trauma patients. **The authors compared the traditional long backboard (LBB) with the Ferno Scoop Stretcher (FSS) (Model 65-EXL).** They hypothesized no difference in movement during application and immobilization between the FSS and the LBB.

**METHODS:** Thirty-one adult subjects had electromagnetic sensors secured over the nasion (forehead) and the C3 and T12 spinous processes and were placed in a rigid cervical collar, with movement recorded by a goniometer (a motion analysis system). Subjects were tested on both the FSS and the LBB. The sagittal flexion, lateral flexion, and axial rotation were recorded during each of four phases: 1) baseline, 2) application (logroll onto the LBB or placement of the FSS around the patient), 3) secured logroll, and 4) lifting. Comfort and perceived security also were assessed on a visual analog scale.

**RESULTS:** **There was approximately 6-8 degrees greater motion in the sagittal, lateral, and axial planes during the application of the LBB compared with the FSS (both  $p < 0.001$ ). No difference was found during a secured logroll maneuver.** The FSS induced more sagittal flexion during the lift than the LBB ( $p < 0.001$ ). The FSS demonstrated superior comfort and perceived security. **CONCLUSION:** The FSS caused significantly less movement on application and increased comfort levels. Decreased movement using the FSS may reduce the risk of further spinal cord injury.

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**Appendix – Further information:****Systematic reviews**

2. Kwan I, Bunn F. Effects of prehospital spinal immobilization: a systematic review of randomized trials on healthy subjects. *Prehosp Disaster Med* 2005;20(1):47-53. [PubMed: PM15748015](#)

**OBJECTIVE:** To evaluate the effects of spinal immobilization on healthy participants. **METHODS:** A systematic review of randomized, controlled trials of spinal immobilization on healthy participants. **RESULTS:** Seventeen randomized, controlled trials compared different types of immobilization devices, including collars, backboards, splints, and body strapping. For immobilization efficacy, collars, spine boards, vacuum splints, and abdominal/torso strapping provided a significant reduction in spinal movement. Adverse effects of spinal immobilization included a significant increase in respiratory effort, skin ischemia, pain, and discomfort. **CONCLUSIONS:** Data from this review provide the best available evidence to support the well-recognized efficacy and potential adverse effects of spinal immobilization. However, comparisons of different immobilization strategies on trauma victims must be considered in order to establish an evidence base for this practice

**Observational studies**

3. Luscombe MD, Williams JL. Comparison of a long spinal board and vacuum mattress for spinal immobilisation. *Emerg Med J* 2003;20(5):476-8. [PubMed: PM12954698](#)

**OBJECTIVES:** This study was designed to compare the stability and comfort afforded by the long spinal board (backboard) and the vacuum mattress. **METHODS:** Nine volunteers wearing standardised clothing and rigid neck collars were secured on to a backboard and vacuum mattress using a standard strapping arrangement. An operating department table was used to tilt the volunteers from 45 degrees head up to 45 degrees head down, and additionally 45 degrees laterally. Movements of the head, sternum, and pubic symphysis (pelvis) from a fixed position were then recorded. The comfort level during the procedure was assessed using a 10 point numerical rating scale (NRS) where 1=no pain and 10=worst pain imaginable. **RESULTS:** The mean body movements in the head up position (23.3 v 6.66 mm), head down (40.89 v 8.33mm), and lateral tilt (18.33 v 4.26mm) were significantly greater on the backboard than on the vacuum mattress ( $p < 0.01$  for all planes of movement). Using the NRS the vacuum mattress (mean score=1.88) was significantly more comfortable than the backboard (mean score=5.22) ( $p < 0.01$ ). **CONCLUSIONS:** In the measured planes the vacuum mattress provides significantly superior stability and comfort than a backboard

4. Malik MH, Lovell ME. Current spinal board usage in emergency departments across the UK. *Injury* 2003;34(5):327-9. [PubMed: PM12719158](#)

The spinal board is widely used as a means of extrication and efficient transport during the pre-hospital phase of trauma management. A number of concerns have been raised regarding its subsequent usage once the patient arrives in the emergency department. We undertook a telephone study of 100 A+E departments in the United Kingdom to ascertain current spinal board usage. Our study demonstrated great variability in practice across the

UK and a marked lack of on-going audit or defined protocols governing spinal board usage following the pre-hospital phase of trauma management

### **Additional references**

5. Dick T. Shivers: preheating your scoop stretcher. *JEMS* 2005;30(1):18. [PubMed:](#) [PM15662340](#)