Position Statement from the National Ski Patrol Medical Advisory Committee on the Selective Use of Backboards *for Possible Spinal Injuries*

Approved by the NSP Medical Committee 3/8/ 2017
Approved by the OEC Supervisor's Committee and the NSP Board of Directors on 4/6/17

This material will be included in the sixth edition of the OEC text and is intended for use in training new OEC technicians and for use at OEC refreshers as of June 1, 2018. This information will be used as the standard of training for the NSP Outdoor Emergency Care program. Patrols may be required to follow local or state EMS guidelines, policies or law that would supersede this level of training.

This position statement narrows indications for backboard and/or spinal immobilization (now called spinal protection) when spinal injuries are suspected. It will be forwarded to the OEC education committee for inclusion into the sixth edition material, and the OEC Refresher Cycle B in 2018. It is not to be distributed to any patroller until a teaching curriculum is developed and approved.

THIS IS FOR INCLUSION IN THE OEC 6TH EDITION, AND THE FALL 2018 OEC REFRESHER, AND IS NOT TO GO OUT SOONER.

INTRODUCTION

The NSP Medical Advisory Committee believes that patrollers and others who use OEC as a reference for care of the injured should always consider the possibility of injury to the axial spine and neurological injury in initial and secondary assessments. If spinal injury is found or suspected, it is necessary to provide careful transfers of the victim and to provide for **spinal protection** to avoid further injury and to provide comfort. Spinal protection means that all transfers should be done with careful attention to limiting spinal motion and may include the use of multiple different devices such as a cot or a gurney, toboggan, back mat (large bean bag type device that is sucked out for immobilization), or backboard as transfer devices. Once the victim is moved to a transportation device, the spine should be protected against further movement with padding and bracing to fill voids and limit movement laterally and axially. Securing an injured person to a spinal protection device is not a benign procedure and subjects an individual to pain, apprehension, potential injury to skin, potential worsening of injury and limited ability to protect the airway. Also this possibly may potentially subject the patient to

extended scene time for trauma and later unnecessary medical evaluation to "clear from the board".

It is the conclusion of the NSP Medical Advisory Committee *that current medical* evidence in 2017 demonstrates that the practice of "spinal immobilization", where backboards with straps are used to secure a conscious victim of trauma during extrication and transport for a possible spinal injury, may be overused or unnecessary. In many cases typically encountered by ski patrollers, spinal immobilization may be causing harm to the patient while not providing any benefit.

Background

Historically, recent studies and medical techniques change our understanding of injuries and the risks associated with them. The medical literature is graded for the power of published studies to represent scientifically verifiable information with the highest credibility given to well-constructed, typically large trials with randomization multiple centers and appropriate controls. Progressively less rigorous studies have lower ratings with the lowest being expert opinion. The longstanding use of backboards and straps has never been the subject of high quality study. Specifically, there are no high quality studies comparing "spinal immobilization" to any alternative. The adoption of the use of backboards and straps is likely based upon an opinion voiced the American Academy of Orthopaedic Surgery's publication "Care of the Sick and Injured" in 1971 which stated "Carefully splint the injured spine, avoiding abnormal or excessive motion. Be sure that the injured person is transported on a long backboard or special stretcher without bending or twisting the spine in any direction".[3] In effect, the authors were encouraging spinal motion restriction but what grew from this was "spinal immobilization" using straps and boards.

The closest we have to high quality studies on spinal immobilization address the likelihood of there being "occult fractures" of the spine and the ability to clinically identify likely spinal injury in the emergency department allowing prediction of when x-rays are necessary (CCR and Nexus). [1-2] Smaller studies have shown the widespread use of backboards without clinical indications resulted in overuse of this technique, potentially harming some patients through delayed medical care, exposure to unnecessary x-rays, confusion in diagnosis, tissue pressure sores, and increased medical cost. [21] Recent studies produced a major shift in thought and practice for spinal immobilization to now be more appropriately termed "spinal protection". They support changing the decision making process from immobilizing patients based solely on mechanism alone toward spinal protection based on mechanism, signs and symptoms. [4-8] This has resulted in multiple EMS systems adopting protocols for selective backboard use. Multiple states (including Connecticut, Maryland, Pennsylvania) and many more fire departments and ambulance services have recently adopted a selective backboard policy.[9-20] The National Association of EMS Physicians and the American College of Surgeons recently collaborated to produce a position statement which supported selective backboard use, recognized that backboards are an extrication and transport device that can result in additional patient problems, and stated that a cot or stretcher are effective alternate methods to provide spine protection without the associated problems. [21]

The National Ski Patrol Medical Advisors are issuing this position statement following the guidelines and recommendations made by multiple organizations. We want to emphasize that it is critical to carefully evaluate an injured person for actual physical signs of a possible spinal injury before deciding to use a backboard and to consider alternate methods of spine protection when feasible.

The decision to institute spinal protection involves multiple steps:

Mechanism
The first step is to assess the mechanism of injury. Was there a significant potential for spinal injury? This would include incidents such as:

- High speed collision of skier/rider with a fixed object
- Falling from a ski lift
- Avalanche burial
- A fall greater than 2.5-3 times a patient's height
- A high speed motor vehicle accident with another occupants death, ejection from the vehicle, unrestrained passenger
- A pedestrian or bicyclist struck by a motor vehicle
- A major bicycle or motorcycle wreck
- High voltage electrical shock or lightening strike

Reliability of Exam
If any of the above is present then an evaluation of the patient's mental status needs to be done:

- Is the patient alert and oriented, responding normally to a verbal command?
- Can the person respond appropriately when asked about a sensory stimulus?
- Is there any intoxication or altered mental status?
- Can the patient respond to questions and your exam?
- Patient's strong focus on a distracting injury mitigates trust of the remainder of the examination

Exam
The final step is to perform a careful physical exam looking for:

- Deformity or step-off of the spinal alignment
- **Midline** tenderness over the spine (not flank or rib tenderness)
- Loss of sensation (numbness) or motor function distal or caudal to an injury
- Flexor or extensor posturing to painful stimuli
- Skull depression or fracture
- Cerebral spinal fluid leak from the nose or ears
- Pelvic fracture with *posterior* pain when side-to-side compression is performed

Spinal protection is REQUIRED when there is:

- **Potential for spine injury WITHOUT a significant alteration of the patients mental status AND actual findings associated with a spinal injury.**
- **Potential for spine injury WITH an alteration of the mental status such that a reliable physical exam cannot be done.**

- **Signs and/or symptoms of a spinal injury as noted above**
- **Multiple injuries in an unresponsive trauma patient**
- **A patient who has become unresponsive, without a witness present, so the mechanism of unresponsiveness is unknown.**

NOTE: ***In an emergent situation requiring rapid transport of a patient where there is possibility of a spinal injury, a toboggan itself can be used to provide spinal protection with proper padding and strapping. Careful handling of the patient is needed.***

NOTE: ***Under rare circumstances when a thorough, complete, detailed exam is not possible on the hill, a backboard is used as a temporary transportation method until a full exam can be accomplished in the first aid room. Continued use is not necessary if not supported by a more complete examination in the first aid room. This is not "spinal clearance", but affording protection of the spine until a detailed exam can be performed.***

NOTE: ***Unless the neck is the site of injury, a cervical collar does NOT need to be used in conjunction with backboard use. However, if the patient is unconscious or the neck is unable to be adequately examined, then a cervical collar is required. If a collar is needed, the entire spine requires protection.***

Spinal precautions are NOT NEEDED for:

- Low energy incidents even with minor physical findings.
- "Just in case" there is an injury or a low level of probability.
- A headache, brief loss of consciousness or concussion in an otherwise alert and oriented patient.
- Patients who are up and walking at the scene without documented physical findings or symptoms
- Penetrating injuries

Minor injuries of the spine where the patient is able to protect himself with muscle guarding, e.g., whiplash, have been shown to do well without spinal protection. The forces involved with careful handling without immobilization of patients having minor spine injuries are less than the large forces involved in the immobilization. Some patients with low energy injuries seek help after several days of activity including walking, sitting and activities of daily living without exacerbating the injury. Ski patrollers should use careful and thoughtful handling of a patient with minor complaints not rising to the level of injury discussed above, and not worry that the lack of immobilization will cause additional damage or injury.

In summary: By understanding the accident mechanism, assessing the patient's mental status, and examining the patient, one is provided the information needed to make an informed decision about the need for spinal protection.

Historical papers

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3. AAOS, 1971, Care of the Sick and Injured

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14. Regional Emergency Medical Services Authority (Reno, NV), Protocol Manual 112-113 7/1/16

15. Alameda County Public Health Department, Alameda County, California, EMS Protocols 138-140. 2016. www.acphd.org/emtpara/manprotocol.aspx

16. Sierra-Sacramento Valley EMS Agency Treatment Protocol T-1, 6/1/15

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18. Michigan Adult Treatment Protocols Section 1-20, Spine Injury Assessment 7/18/14

19. Maryland State EMT Protocols 2016, p167-168; www.MIEMSS.org

20. Rogue Medic Blog 3/18/15

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21. White CC, Domeier RM, Millin MG. EMS Spinal Precautions and the Use of the Long Backboard – Resource Document to the Position Statement of the National Association of EMS Physicians and the American College of Surgeons Committee on Trauma. Prehosp Emerg Care 2014; 18:306-314