



Consensus Statement: Spinal Motion Restriction March 2022

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Preamble:

This consensus statement has been revised from original dated November 2014, titled “**Pre-hospital and Inter-hospital Use of long Spine Boards**” and summarizes recommendations for the care of trauma patients who require spinal motion restriction. Recommendations are based on current best practice and is adapted from medical literature. It is recognized that the geography, population, and availability of specialized services in New Brunswick provide a unique context to be considered in any overall recommendations.

Background:

1. This consensus statement addresses the spinal motion restriction needs for patients during the emergency phase of care. For patients with a diagnosis of cervical spine injury, consultation with Trauma NB's Management of Cervical Spine Injuries consensus statement is recommended.
2. Though the incidence of spinal injury in Canada is relatively low, the annual economic burden is substantial (8).
3. For decades, the prehospital trauma patient with suspected spinal injury has been managed *via* the application of a "long backboard" AND "rigid cervical collar" based on mechanism of injury and not a physical examination (1).
4. The efficacy of the long backboard to prevent further trauma to the spine has never been proven in high-level trials (5,12). An extensive literature review on the history for removal of long spine board as a tool concluded that it is ineffective, and it causes detrimental effects to patients (1).
5. Several systematic reviews of the literature (5,10,12) on the use of a long backboard have determined the following – from delaying treatments in time-sensitive patients, such as unstable vertebral column injury, to increasing pain, discomfort, aspiration risk, intracranial pressure, risk for ulcer formation, and morbidity.
6. Several consensus statements (3,14) have strongly urged the need for a system of selective immobilization designed to reduce the risks to the patient, as well as advocating for the use of non-metallic scoops for transfer of patient with suspected spinal injury.
7. Although the term 'spinal immobilization' has been recognized for years to reference the use of a long backboard, many prehospital protocols have replaced it with 'spinal motion restriction (SMR)' – the application of a cervical collar and reduced handling and transport of patient with suspected spinal injury. Other protocols and guideline development for SMR have led to the development of related decision support tools (4,6,7).
8. A systematic review of literature as it relates to non-immobilized spine-injured patients in the prehospital environment studied four questions: accuracy to rule out spine injuries, tools used, injuries missed, and any harm suffered from not being immobilized. It concluded that there was no neurological deterioration in spine-injured patients when SMR guidelines were followed (11). A retrospective observational study determined no change in the incidence of spinal cord injury following implementation of SMR protocols.
9. Eastern Association for the Surgery of Trauma (EAST), the National Association of EMS Physicians (NAEMSP), and the American College of Surgeons Committee on Trauma (ACS-COT) all support a strong recommendation against the use of spinal immobilization in patients with isolated penetrating injuries. It is associated with increased mortality and neurologic injury and furthermore, studies demonstrate that it has no benefit in preventing neurological deficits, even potentially reversible neurologic deficits (13,14).

Recommendations:

For pre-hospital patients (that is, those being transported from scene to first hospital):

- ANB should continue the application of the current pre-hospital Canadian C-Spine Rule (CCR) for all qualifying patients where cervical spine injury is a concern.
- Patients who are ambulatory at the scene upon EMS arrival but fail CCR, require only immobilization with a rigid cervical collar and supine positioning on the ambulance stretcher. These patients may walk to the ambulance stretcher, if appropriate.
- For blunt trauma patients who are not ambulatory at the scene and for whom current protocols recommend spinal immobilization, use of the long spine board for extrication may continue and should be removed as soon as physically possible.
- Any patient with a suspected spinal injury will be placed supine and managed with SMR, including application of a rigid cervical collar.
- Any unconscious patient involved in a trauma event will have a rigid cervical collar applied and managed with SMR.
- Upon arrival at hospital, paramedics will advise receiving Emergency Department staff of suspected spinal injury and of SMR precautions initiated at the scene.
- Use of scoop stretcher during pre-hospital phase of care is recommended.
- If the patient exhibits any signs or symptoms of spinal cord injury, SMR of the entire spine should be maintained throughout the pre-hospital phase of care.

Receiving trauma centres:

- Are responsible to continue SMR until spinal injury has been ruled out by the Attending MD.

For inter-hospital trauma transfers:

When a spinal injury has not been ruled out:

- A scoop stretcher or equivalent should be used to transfer the patient from hospital stretcher to the ambulance stretcher at the sending facility.
- The scoop stretcher or equivalent should not be left in place during transfer – even in cases of actual or suspected spinal cord injury. Continued spinal motion restriction, however, is expected.
- At the request of the spine surgeon, some sending sites may be requested to replace the rigid extrication collar with one of the following for transfer: Aspen, Malibu, Miami J, and/or Philadelphia.
- Upon arrival at ED, a scoop stretcher or equivalent can be used to transfer the injured patient to the Emergency Department stretcher.

Special patient populations:

- **Bariatrics:** No change from the guidance offered above is recommended. Positioning should ensure neutral alignment of cervical spine when possible. Avoid hyperextension of c-spine when placing supine.
- **Geriatrics:** No change from the guidance offered above is recommended. Note that this population may have numerous co-morbid factors and can be more prone to spinal injuries with lower MOI. Cervical spine x-ray in this population can be indeterminate and thus, transfer may be required for advanced imaging. Applying these strategies early with this population should improve outcomes.
- **Pediatrics:** Paramedics to continue the use of infant car seats or PediPacs, both of which can remain in place during inter-facility transfer, if required. There has been a lack of evidence and studies on generalization of adult recommendations to the pediatric population due to anatomical differences. These include increased head to body size ratio, posterior occipital area of child creating airway occlusion when supine. Note that this population is at risk for spinal cord injury without radiological abnormalities (SCIWORA).

GRADE Level of Evidence:

- Level B: Recommendation
- Generally, clinicians should follow the recommendations but should remain alert to new information and sensitive to patient preferences.

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This consensus statement was first created in 2014, with thanks to the healthcare professionals in New Brunswick listed below:

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