

Spinal Motion Restriction Protocol

I. Purpose

The purpose of this protocol is to outline spinal precautions which limit movement and prevent further spinal cord damage following traumatic injury while reducing the negative affects of traditional spinal immobilization using a long spinal board and strap system.

II. Definition

Spinal Motion Restriction (SMR) describes the procedure used to immobilize patients with possible spinal injuries. SMR includes:

- Reduction of gross movement by the patient
- Reduce the potential of additional damage to the spine
- Regular reassessment of motor/sensory function

III. Indications

Apply spinal motion restriction to any patient identified to have a potential spine injury that might benefit from application of spinal precautions.

High-Risk Patient

- Any altered mental status (GCS <15) including possible intoxication from alcohol or drugs, agitation.
- Pediatric patients may demonstrate altered mental status with agitation, apnea, hypopnea, or somnolence.
- Midline neck or back pain and/or tenderness.
- Focal neurologic signs and/or symptoms (e.g. weakness, tingling, or numbness). - Anatomic deformity of the spine.
- Torticollis (self-splinting or painful rotation/tilt of the neck).
- Unreliable patient interaction including distraction from painful injury or distressing circumstances. - Communication/language barrier that prevents accurate assessment. - Lack of cooperation or contribution during exam.

High-Risk Mechanism

- Meets Field Trauma Triage mechanism criteria
- Age >65
- Axial load injuries (diving injuries, spearing tackle), sudden acceleration/deceleration, lateral bending forces to neck/torso.

A complete patient assessment should be performed prior to application of SMR and following application of SMR.

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IV. Procedure

1. General Principles: The following are acceptable methods to achieve spinal motion restriction. When any spinal injury is suspected, motion along the entire spinal column should be limited by using a tools listed in (A) and (B) or (C). If the patient experiences negative effects from a particular SMR method, alternative measures should be implemented. This list is arranged from the least invasive to the most invasive:

A. Cervical Spinal Motion Restriction:

- i. Appropriately sized cervical collar
- ii. If the patient has significant kyphosis, lordosis, pain with movement of the cervical spine to the midline, or is otherwise not able to tolerate a cervical collar, use manual c-spine stabilization, towels or other padding to restrict movement of the cervical spine in a manner which is most comfortable for the patient.

B. Thoracic and Lumbar Spinal Motion Restriction:

- i. Supine positioning on gurney with cervical collar only.
- ii. Head of bed can be elevated to a maximum of 30 degrees as limited by patient discomfort.

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- C. Options for Cervical, Thoracic, and Lumbar Spinal Motion Restriction
- i. Position with vacuum mattress device splinting from head to toe
 - ii. Child car seat with appropriate supplemental padding
 - iii. Supine positioning on scoop stretcher or long backboard, secured with strap system and appropriate padding including head blocks.
2. Procedural Steps:
- a. Provide manual stabilization to restrict gross head movement. Alert, cooperative patients without cognitive impairment may be allowed to self-limit movement with or without collar, especially if already ambulating before your arrival.
 - b. Place appropriately sized cervical collar.
 - c. Obtain history and perform careful examination to evaluate for complaints of pain, numbness, or tingling as well as GCS neurologic deficits, spine tenderness, deformity or painful distracting injury.
 - d. Extricate patient while limiting flexion, extension, rotation, and distraction of the spine. Tools such as pull sheets, scoop stretchers, and other flexible devices may be used as needed. Long backboards with low friction surfaces may result in more spine movement from torso and head slippage. These should have limited utilization.
 - e. If the patient is to be transported on a hard device, apply adequate padding to prevent tissue ischemia and increase patient comfort.
 - f. Repeat your neurologic examination and regularly reassess motor/sensory function.
 - g. Consider the use of SpO₂ and EtCO₂ to monitor respiratory function.
 - h. For pediatric patients 6 years of age and younger or < 60 pounds requiring spinal motion restriction, transport in a pediatric restraint system. Utilize pediatric restraint systems for older/larger children when appropriate and if they fall within the device's recommended range.
 - i. Apply padding and cervical collar as tolerated to minimize the motion of the child's spine. Rolled towels may be used for very young children or those who do not tolerate a collar.
 - j. For pediatric patients found in car seats, use the following if spinal motion restriction is indicated:
 - Infants restrained in a rear-facing car seat may remain in car seat if not compromised and their condition allows (no signs of respiratory distress or shock).
 - Children restrained in a car seat (with a high back) may be immobilized and extricated in the car seat; however once removed from the vehicle, the child should be placed in spinal motion restriction.

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- Children restrained in a booster seat (without a back) need to be extricated and immobilized following standard spinal motion restriction procedures
- k. Carefully document your exam findings from before and after patient movement and packaging.

V. Special Notes

- Unreliable patients include: anyone who is altered or intoxicated or in whom evaluation may be limited due to a communication barrier, those patients who are uncooperative or distracted by other injuries and circumstances.
- Use spinal motion restriction with caution for patients presenting with dyspnea and position appropriately. Spinal motion restriction may limit respiratory function, particularly in geriatric and pediatric patients. For these patients restrict long spine board use. In patients with acute or chronic difficulty breathing, SMR is known to reduce respiratory function as much as 20%.
- With combative patients, avoid methods that provoke increased spinal movement and/or combativeness.