Spinal Care

(Adapted from an evidence-based guideline created using the National Prehospital Evidence-Based Guideline Model Process)

Aliases

None noted

Patient Care Goals

1. Identify patients for whom spinal motion restriction (SMR) is indicated.
2. Minimize secondary injury to spine in patients who have, or may have, an unstable spinal injury.
3. Minimize patient morbidity from the use of immobilization devices.

Patient Presentation

Inclusion criteria

Traumatic mechanism of injury

Exclusion criteria

No recommendations

Patient Management

Assessment

1. Assess the scene to determine the mechanism of injury.
    a. Mechanism alone should not determine if a patient requires spinal motion restriction; however, mechanisms that have been associated with a higher risk of injury are:
        i. Motor vehicle crashes (including automobiles, all-terrain vehicles, and snowmobiles).
        ii. Axial loading injuries to the spine.
        iii. Falls greater than 10 feet.
2. Assess the patient in the position found for findings associated with spine injury:
    a. Mental status
    b. Neurologic deficits
    c. Spinal pain or tenderness
    d. Any evidence of intoxication
    e. Other severe injuries, particularly associated torso injuries

Treatment and Interventions

1. Place patient in cervical collar if there are any of the following:
    a. Patient complains of midline neck or spine pain
    b. Any midline neck or spinal tenderness with palpation
    c. Any abnormal mental status (including extreme agitation)
    d. Focal or neurologic deficit
    e. Any evidence of alcohol or drug intoxication
    f. Another severe or painful distracting injury is present, especially injuries to the head
    g. Torticollis (in children)
    h. A communication barrier that prevents accurate assessment
2. **Note:** If none of the above apply, patient may be managed without a cervical collar.
3. Do not place patients with penetrating injury to the neck in a cervical collar, and do not employ other spinal precautions regardless of whether or not they are exhibiting neurologic symptoms. Doing so can lead to delayed identification of injury or airway compromise, and has been associated with increased mortality.
4. Employ the following if extrication is required:

    a. From a vehicle: After placing a cervical collar, if indicated, children in a booster seat and adults should be allowed to self-extricate. For infants and toddlers already strapped in a car seat with a built-in harness, extricate the child while strapped in his or her car seat.
    b. From other situations: A padded long board may be used for extrication, using the lift and slide (rather than a logroll) technique.
5. Employ the following if patient is wearing a helmet:
    a. Football helmet: Remove the face mask followed by manual removal (rather than using automated devices) of the helmet while keeping the neck manually immobilized. Occipital and shoulder padding should be applied, as needed, with the patient in a supine position, in order to maintain neutral cervical spine positioning.
    b. Other helmet types: Evidence is lacking to provide guidance about other types of helmet removal.
6. Do not transport patients on rigid long boards, unless the clinical situation warrants long board use. An example of this may be facilitation of immobilization of multiple extremity injuries or an unstable patient where removal of a board will delay transport and/or other treatment priorities. In these situations, long boards should ideally be padded or have a vacuum mattress applied to minimize secondary injury to the patient.
7. Transport patients to the nearest appropriate facility in accordance with the National Guidelines for the Field Triage of the Injured Patients.
8. Immobilize patients with severe kyphosis or ankylosing spondylitis in a position of comfort using towel rolls or sand bags. These patients may not tolerate a cervical collar.

Patient Safety Considerations

- Immobilized patients with nausea or vomiting, or with facial or oral bleeding can potentially suffer airway compromise or aspiration.
- Excessively tight immobilization straps can limit chest excursion and cause hypoventilation.
- Prolonged immobilization on spine board can lead to ischemic pressure injuries to skin.
- Prolonged immobilization on spine board can be very uncomfortable for patient.
- Children are abdominal breathers, so immobilization straps should go across chest and pelvis and not across the abdomen, when possible.
- Children have disproportionately larger heads. When securing pediatric patients to a spine board, the board should have a recess for the head, or the body should be elevated approximately 1–2 cm to accommodate the larger head size and avoid neck flexion when immobilized.
- In an uncooperative patient, avoid interventions that may promote increased spinal movement.
- The preferred position for all patients with spine management is flat and supine. There are three circumstances under which raising the head of the bed to 30 degrees should be considered:
    - Respiratory distress
    - Suspected severe head trauma
    - Promotion of patient compliance

Notes and Educational Pearls

Key Considerations

- Evidence is lacking to support or refute the use of manual stabilization prior to spinal assessment in the setting of a possible traumatic injury, when the patient is alert with spontaneous head and neck movement.
  Providers should not manually stabilize these alert and spontaneously moving patients, since patients with pain will self-limit movement, and forcing immobilization in this scenario may unnecessarily increase discomfort and anxiety.
- Certain populations with musculoskeletal instability may be predisposed to cervical spine injury. However, evidence does not support or refute that these patients should be treated differently than those who do not have these conditions. These patients should be treated according to the Spinal Care guideline like other patients without these conditions.
- Age alone should not be a factor in decision-making for prehospital spine care, yet the patient's ability to reliably be assessed at the extremes of age should be considered. Communication

barriers with infants and toddlers or elderly patients with dementia may prevent the provider from accurately assessing the patient.
- Spinal precautions should be considered a treatment or preventive therapy.
- Patients who are likely to benefit from immobilization should undergo this treatment.
- Patients who are not likely to benefit from immobilization, who have a low likelihood of spinal injury, should not be immobilized.
- Ambulatory patients may be safely immobilized on gurney with cervical collar and straps and will not generally require a spine board.
- Reserve long spine board use for the movement of patients whose injuries limit ambulation and who meet criteria for the use of spinal precautions. Remove from the long board as soon as is practical.

Pertinent Assessment Findings

- Mental status
- Normal neurologic examination
- Evidence of intoxication
- Evidence of multiple trauma with other severe injuries

Quality Improvement

Associated NEMSIS Protocol(s) (eProtocol.01)

- 9914107—Injury-Spinal Cord
- 9914073—General-Spinal Precautions/Clearance

Key Documentation Elements

- Patient complaint of neck or spine pain
- Spinal tenderness
- Mental status, GCS
- Neurologic examination
- Evidence of intoxication
- Documentation of multiple trauma
- Documentation of mechanism of injury
- Documentation of patient capacity with:
    - Any and all barriers to patient care in the NEMSIS element "Barriers to Patient Care" (eHistory.01-required of all software systems).
    - Exam fields for Mental Status and Neurological Assessment.
    - Vitals for Level of Responsiveness and Glasgow Coma Scale.
    - Alcohol and drug use indicators.
- Patient age
- Patients under age and not emancipated: Guardian name, contact, and relationship

Performance Measures

- Percentage of patients with high risk mechanisms of injury and/or signs or symptoms of cervical spine injury who are placed in a cervical collar
- Percentage of patients without known trauma who have a cervical immobilization device placed (higher percentage creates a negative aspect of care)
- Percentage of trauma patients who are transported on a long backboard (target is a low percentage)
- Percentage of patients with a cervical spinal cord injury or unstable cervical fracture who did not receive cervical collar
- ***EMS Compass Measures*** *(for additional information, see www.emscompass.org)*
    - *PEDS-03: Documentation of estimated weight in kilograms.* Frequency that weight or length-based estimate are documented in kilograms

- *Trauma-01: Pain assessment of injured patients.* Recognizing that pain is undertreated in injured patients, it is important to assess whether a patient is experiencing pain
- *Trauma-02: Pain re-assessment of injured patients.* Recognizing that pain is undertreated in injured patients, it is important to assess whether a patient is experiencing pain
- *Trauma-04: Trauma patients transported to trauma center.* Trauma patients meeting Step 1 or 2* or 3** of the *CDC Guidelines for Field Triage of Injured Patients* are transported to a trauma center
    - Any value documented in NEMSIS eInjury.03 - Trauma Center Criteria * 8 of 14 values under eInjury.04 - Vehicular, Pedestrian, or Other Injury Risk Factor match Step 3, the remaining 6 value options match Step 4

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