

Spinal Trauma

The Connecticut Department of Public Health and the physician EMS medical directors of the Connecticut EMS Medical Advisory Committee have approved the following guideline. This guideline represents a significant change in practice for EMS providers. It reflects our intention to ensure EMS standards in Connecticut remain consistent with the best emergency medicine standards. Services should consult with their EMS sponsor hospital regarding implementation of and training in the use of this guideline. Resources are available on the Education and Training page of the CT OEMS website at: <http://www.ct.gov/dph/EMS>

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PURPOSE: This protocol provides guidance regarding the assessment and care of patients who have a possible spinal injury.

EMT/ADVANCED EMT/PARAMEDIC STANDING ORDERS

ASSESSMENT FOR SELECTIVE SPINAL CARE

Patients who have experienced a mechanism of spinal injury (especially high risk mechanisms - See Red Flag Box) require spinal motion restriction (as described further on) and protection of the injury site if they exhibit any of the following:

- Midline spinal pain, spinal deformity or tenderness with palpation;
- Abnormal (i.e. not baseline) neurological function or motor strength in any extremity;
- Numbness or tingling (paresthesia);
- Sensation is not intact and symmetrical (or baseline for patient);
- Cervical flexion, extension and rotation elicits midline spinal pain.

OR if they cannot competently participate in the assessment due to one of the following:

- Altered mental status (e.g., dementia, preexisting brain injury, developmental delay, psychosis, etc.);
- Alcohol or drug intoxication;
- Distracted by significant injuries to self or others;
- Insurmountable communication barriers (e.g. hearing impairment, language, etc.).

Patients without any of the above findings should generally be transported without the use of a cervical collar or other means to restrict spinal motion. When possible, the highest level provider on scene should determine whether spinal motion restriction is to be used or discontinued (collar removed, etc.).

When spinal motion restriction has been initiated and a higher level provider arrives, patients should be reassessed for spinal injury (as described in this section) to determine the most appropriate ongoing care.

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Mechanisms that indicate a high risk for spinal injury include:

- Motor vehicle crash >60 mph, rollover, ejection (low-speed, rear-end can usually be excluded).
- Falls >3 feet/5 stairs (patient standing with feet 3' above floor).
- Axial load to head/neck (e.g., diving accident, heavy object falling onto head, contact sports).
- Significant injury or mechanism of injury above the clavicle.
- Injuries involving motorized recreational vehicles.
- Bicycle struck/collision.



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EMT/ADVANCED EMT/PARAMEDIC STANDING ORDERS

PEDIATRIC PATIENTS

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- For pediatric patients 6 y/o and younger or <60 pounds requiring spinal motion restriction, transport in a pediatric restraint system (as described in the ambulance minimum equipment list). Utilize pediatric restraint systems for older/larger children when appropriate and they fall within the device's recommended range.
- 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.
- Avoid methods that provoke increased spinal movement.
- In a motor vehicle crash infants and children may remain in their own child safety seat, provided all of the following conditions are met:
 - 1) The seat has a self-contained harness;
 - 2) It is a convertible seat with both front and rear belt paths;
 - 3) Visual inspection, including under movable seat padding, does not reveal cracks or deformation;
 - 4) Vehicle in which safety seat was installed was capable of being driven from the scene of the crash;
 - 5) Vehicle door nearest the child safety seat was undamaged;
 - 6) The airbags (if any) did not deploy;
 - 7) Provider ensures appropriate assessment of patient posterior.
- If the patient requires significant care (e.g. airway management) that cannot be adequately performed in the car seat or pediatric restraint system, remove the patient and secure him/her directly to the stretcher.

PEARLS:

- As with traumatic brain injury, secondary injury to the spine often arises from increased pressure (e.g. swelling, edema, hemorrhage) or from hypoperfusion or hypoxia (e.g. vascular injury). While the optimal treatment for secondary injury has not been established, providers should protect the injury site and be cognizant of the risk of secondary injury.
- In some circumstances, extrication of a patient using traditional spinal immobilization techniques may result in greater spinal movement or may dangerously delay extrication.
- Studies suggest protecting the injury site from pressure may be as important as reducing spinal movement.
- All patients who have suffered possible spinal trauma should be handled gently and spinal motion should be minimized.
- Caution should be exercised in older patients (e.g. 65 years or older) and in very young patients (e.g. less than 3 years of age), as spinal assessment may be less sensitive discerning spinal fractures in these populations.
- Only remove secure-fitting helmets from patients receiving spinal motion restriction when necessary to provide clinically important patient care (e.g. airway maintenance, ventilation, etc.).

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CARE FOR PATIENTS WITH POSSIBLE SPINAL INJURY

- Routine Patient Care.
- Maintain manual in-line stabilization during assessment.
- Minimize spinal movement during assessment and extrication.
- Self-extrication by patient is allowable if patient is capable.
- A long backboard, scoop stretcher, vacuum mattress, or other appropriate full length extrication device may be used for extrication if needed.
- Apply adequate padding to prevent tissue ischemia and minimize discomfort.

If patient requires spinal motion restriction:

- Apply a cervical collar.
- For ambulatory patients, allow the patient to sit on the stretcher, and then lie flat. (The "standing take-down" is eliminated.)
- Pull sheets, other flexible devices, scoops and scoop-like devices should preferentially be utilized to move non-ambulatory patients when appropriate. Long, rigid spine boards should have only limited utilization.
- Once the patient is moved to the stretcher, remove any hard backboard device.
- Patients should only be transported to the hospital on a rigid vacuum mattress or hard backboard if removal would delay transport of an unstable patient or it is necessary for other treatment priorities.
- Lay the patient flat on the stretcher, secure firmly with all straps, and leave the cervical collar in place. Elevate the back of the stretcher only if necessary to support respiratory function, patient compliance or other significant treatment priority.
- Instruct the patient to avoid moving their head or neck as much as possible.
- Consider the use of SpO₂ and EtCO₂ to monitor respiratory function.
- For conscious patients who poorly tolerate a rigid cervical collar (e.g., due to anxiety, shortness of breath), the cervical collar may be replaced with a towel roll and/or padding to minimize spinal motion.
- Patients with nausea or vomiting may be placed in a lateral recumbent position maintaining the head in a neutral position using manual stabilization, padding, pillows, and/or the patient's arm. Refer to applicable nausea and vomiting protocol.
- Transfer from ambulance to hospital stretchers and vice versa should be accomplished while continuing to limit motion of the spine. The use of slide boards, sheet lifts, etc. should be considered.

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- **Long backboards do not have a role for patients being transported between facilities.** If the sending facility has the patient on a long backboard or is asking EMS to use a long backboard for transport, EMS providers should discuss NOT using a long backboard with the sending facility physician before transporting a patient. If the sending physician requires a long backboard be used, it should be padded to minimize patient discomfort.
- **Use spinal motion restriction with CAUTION for patients presenting with dyspnea and position appropriately.** Spinal motion restriction may limit respiratory function with the greatest effect experienced by geriatric and pediatric patients restricted to a long spine board.
- **Combative patients:** Avoid methods that provoke increased spinal movement and/or combativeness.
- **Patients with penetrating trauma such as a gunshot or stab wounds should NOT be immobilized on a long spine board.** Additional movement will not worsen an already catastrophic spinal injury with neurological deficit. Emphasis should be on airway and breathing management, treatment of shock, and rapid transport to a level 1 or 2 trauma center.

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