

Proposed Cervical Spine Immobilization Guideline

For patients who cannot be clinically cleared by the Canadian C-Spine or NEXUS clinical decision rules, cervical collars should be placed and maintained until the patient's cervical spine can be clinically and radiographically cleared.

Cervical collar placement **may** be deferred in favor of a position of comfort, at the judgement of the treating provider, for patients who:

- i. Present without a collar in place
- ii. Are ambulatory
- iii. Are neurologically intact (motor and sensory)
- iv. Are alert
- v. Are not intoxicated
- vi. Are otherwise deemed to be at low risk of clinically-significant spinal injury by the treating provider

Patients who arrive with cervical collars in place should be clinically cleared prior to removal.

1. This patient population is at an extraordinarily low risk of significant cervical spine injury.
 - a. Comparison of the occurrence of spinal injury in patients who were ambulatory vs non-ambulatory at the scene of an MVC. Results showed that in the group of ambulatory patients, only 5% had spinal injuries, and all of the injuries were stable fractures that did not require surgical intervention or result in spinal cord injury. **[Loza, A, McCoy, E, Puckett, J, Penalosa, P. Are immobilization backboards and C-collars needed for patients who are ambulatory at the scene of a motor vehicle accident? The occurrence of spinal injury [abstract]. *Ann Emerg Med* 2013; 62: S144.]**
2. Cervical collars are not effective in preventing movement of the cervical spine, and may be detrimental. They are known to be uncomfortable, restrict access to the airway, contribute to skin breakdown, and have been shown to increase cranial-caudal displacement in unstable cervical spine injuries.
 - a. Biometric and kinematic study demonstrating that a perfectly applied collar by trained personnel allows a minimum 30° of flexion/extension/rotation movement of the neck. **[James CY, Riemann BL, Munkasy BA, Joyner AB. Comparison of cervical spine motion during application among 4 rigid immobilization collars. *J Athl Train*. 2004;39:138-145.]**
 - b. In the presence of severe injury, collar application resulted in 7.3 mm +/- 4.0 mm of separation between C1 and C2 in a cadaver model, consistent with previous evidence that extrication collars can result in abnormal distraction within the upper cervical spine in the presence of a significant injury **[Ben-Galim P, Dreiangel N, Mattox KL, Reitman CA, Kalantar SB, Hipp JA. Extrication collars can result in abnormal separation between vertebrae in the presence of a dissociative injury. *J Trauma*. 2010;69:447-50.]**
 - c. Comparison of spine injury patients from 2 study populations, one with out-of-hospital spinal immobilization and the other without, showed a higher rate of

neurologic injury in the immobilized group. Acute spinal immobilization may not have significant benefit for the prevention of neurologic deterioration from unstable spinal fractures. [**Hauswald M, Ong G, Tandberg D, Omar Z. Out-of-hospital spinal immobilization: Its effect on neurologic injury. Acad Emerg Med. 1998;5:214-9.**]

3. Patients with cervical spine injuries naturally undergo muscle splinting, and the natural muscle contraction, pain, and restriction of motion are likely to be as equal or better in restricting motion of the cervical spine.
 - a. Minor degrees of cervical spine movement are without consequence and more significant movement is prevented by common sense. Moreover, awake patients generally maintain a stable neck position with muscle contractions that protect the spinal cord. [**Anson Jose, Shakil Ahmed Nagori, Bhaskar Agarwal, Ongkila Bhutia, and Ajoy Roychoudhury. Management of maxillofacial trauma in emergency: An update of challenges and controversies. Journal of Emergencies, Trauma, and Shock. 2016 Apr-Jun: 9(2) 73-80**]
 - b. For the vast majority of trauma patients, who are fully alert, stable and co-operative when their cervical spine is immobilized, we suggest that this is an unnecessary and potentially harmful precaution. Natural muscle spasm will provide protection that is far superior to any artificially imposed or universal posture, and the position that the patient themselves finds most comfortable (the "position of comfort") is likely to be the best for their particular injury. [**Benger J, Blackham J. Why do we put cervical collars on conscious trauma patients? Scand J Trauma Resusc Emerg Med. 2009;17:44.**]