Updates in Cervical Spine Precautions & Cervical Collar Placement in Trauma Patients (Quick Reference for EM Physicians)

Adults

- In recent years, debate has continued over whether the routine application of a semi-rigid cervical collar +/- the use of a rigid backboard is necessary for the transport and initial evaluation of trauma patients\textsuperscript{12}
- Evidence exists suggesting there are complications related to cervical collar placement and backboard use in trauma patients beyond simply discomfort, including increased risk for aspiration and respiratory issues, elevated intracranial pressure, development of pressure wounds and skin breakdown, and delays in airway management and completion of evaluation\textsuperscript{3}
- Although there is an abundance of published literature on spinal immobilization in trauma patients, there is a lack of randomized control trials evaluating the benefits of spinal immobilization in this population\textsuperscript{4}
- Clinical decision rules based on large trials (NEXUS, CCR) for assessing the necessity of cervical spine imaging have now existed for over two decades, these tools can be applied for clearance of the cervical spine without imaging in a subset of trauma patients\textsuperscript{5}\textsuperscript{6}
- Both rules mentioned above have been externally validated in subsequent studies at multiple clinical sites and when applied by both physicians and nurses\textsuperscript{7}\textsuperscript{8}\textsuperscript{9}
- A recently published single-center prospective cohort study with >4,000 patients suggested paramedics can safely and effectively clear the cervical spine in low-risk trauma patients, significantly reducing the need for immobilization during transport\textsuperscript{10}
- Evidence does not exist for clearance of the cervical spine without imaging in altered (GCS <15) or unstable trauma patients

Pediatrics

- Fortunately, cervical spine injuries secondary to trauma are rare in pediatric patients, however they are associated with high morbidity and mortality
- Due to a lack of high-quality evidence in the pediatric population, most guidelines are based on expert opinion\textsuperscript{11}
- For patients with low clinical suspicion of injury, there are assessments and clinical decision tools which can be used to clear the cervical spine without imaging, or by utilizing simple radiographs prior to CT\textsuperscript{12}
- There is no strong recommendation of initial imaging modality for assessment\textsuperscript{13}

\textsuperscript{1} Orman R, Colwell C (2016)  
\textsuperscript{2} Buck A, Colwell C (2017)  
\textsuperscript{3} Deasy C, Cameron P (2011)  
\textsuperscript{4} Kwan I et al (2001)  
\textsuperscript{5} Hoffman JR et al (2001)  
\textsuperscript{6} Stiell IG et al (2001)  
\textsuperscript{7} Stiell IG et al (2010)  
\textsuperscript{8} Coffey F et al (2011)  
\textsuperscript{9} Tran J et al (2016)  
\textsuperscript{10} Vaillancourt et al (2022)  
\textsuperscript{11} Copley et al (2019)  
\textsuperscript{12} Hannon et al (2015)  
\textsuperscript{13} Rozelle CJ et al (2013)
Updates on Cervical Spine Clearance after Negative Imaging Computed Tomography (CT) Imaging:

- In 2015, the Eastern Association for the Surgery of Trauma (EAST) conducted a systematic review of 11 studies examining CT cervical spine imaging in obtunded patients, with over 1,700 total subjects, which showed a negative predictive value (NPV) of CT for unstable cervical spine injury of 100% in this population.\(^{14}\)
- Based on this review, EAST gave a conditional recommendation for removal of cervical collar after negative CT cervical spine in obtunded patients.
- In 2017, the Western Trauma Association (WTA) conducted a multicenter trial involving over 10,000 patients with traumatic injury and reported CT imaging of the cervical spine missed only 3 clinically significant injuries, for a NPV of 99.97%.\(^{15}\)
- When CT imaging was combined with clinical exam for focal neurologic deficit, the NPV was 100%.
- The WTA proposed an algorithm based on this study that would allow cervical spine clearance in trauma patients with negative CT imaging and negative physical/neurologic exam, without the need for additional imaging for other persistent symptoms.
- Most of the centers included in these studies were trauma centers with modern high-quality multiplanar CT scanners and radiologists familiar with reading these studies.
- Institutions without radiologists who are experienced at reading imaging of patients with traumatic injury or without modern CT scanners may take a more conservative approach in management of this patient population.

References


