Australasian Emergency Nursing Journal (2016) 19, 63—74

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/aenj

RESEARCH PAPER

Can emergency nurses safely and accurately remove cervical spine collars in low risk adult trauma patients: An integrative review

Nicola Smith, RN MEmergN [a,b,*]
Kate Curtis, RN, PhD [a,c]

[a] *Sydney Nursing School, The University of Sydney, 88 Mallett Street, Camperdown, Sydney, NSW 2050, Australia*
[b] *Emergency Department, St. Vincents Public Hospital, 390 Victoria Street, Darlinghurst, Sydney 2010, Australia*
[c] *Trauma Service, St George Hospital, Gray St, Kogarah 2217, Australia*

Received 16 October 2015; received in revised form 22 January 2016; accepted 24 January 2016

KEYWORDS
Injury;
Spine;
Emergencies;
Nursing;
Patient outcome assessment;
Clinical decision making

Summary
Background: Well validated clinical decision rules exist to facilitate the safe removal of collars in the alert, orientated, low risk adult trauma patient, however this practice is traditionally conducted by medical staff. The aim of this review is to synthesise current evidence to determine the efficacy of emergency nurses in safely and accurately removing cervical spine collars using cervical spine rules, in alert, orientated, low risk trauma adult patients.
Methods: A multi-method search strategy was used to find primary research studies followed by a rigorous screening and quality appraisal process. Data from included articles were extracted, grouped and synthesised.
Results: Nine quantitative research articles resulted in four key findings: the inter-rater reliability between nurses and doctors clearing the cervical spine was high (kappa range (0.61—0.80)); nurses can safely implement the cervical spine clinical decision rule; use of a cervical spine clinical decision rule decreases the time patients are immobilised and; nurses felt confident applying a cervical spine clinical decision rule.

* Corresponding author at: St. Vincents Public Hospital, Emergency Department, 390 Victoria Street, Darlinghurst, Sydney 2010, Australia. Tel.: +61 02 8382 2473.
E-mail address: nicolasmith26@gmail.com (N. Smith).

http://dx.doi.org/10.1016/j.aenj.2016.01.003

Conclusion: Appropriately trained emergency nurses can safely apply cervical spine rules to alert, orientated, low risk adult trauma patients. Implementation of nurses clearing cervical spines should include training and ongoing monitoring.

What is already known

- The Canadian C-Spine rule (CCR) and the National Emergency X-Radiography Utilisation Study (NEXUS) criteria are well validated, widely used clinical decision rules to guide the clearance of the c-spine and radiography in patients with low risk trauma.
- Uptake of these clinical decision rules are varied and spinal immobilisation can stay in place unnecessarily for protracted periods of time in the alert, orientated low risk adult trauma patient. This causes prolonged discomfort and carries risk of complications such as; aspiration, respiratory compromise, iatrogenic pain, pressure ulceration and unjustified radiography. Further, there are routinely and without justification patients receiving unnecessary radiographic imaging.
- As clinicians we must be continuously reviewing our practice for best patient outcomes. In the context of an increasing patient population and the impact this has on emergency department resources, current practices must be reviewed.

What this paper adds

- This paper reviews literature and contributes to the discourse of emergency nurses clearing c-spine collars in low risk adult trauma patients. More specifically this integrative review adds a new body of information to the potential introduction of nurse lead c-spine collar clearance in the emergency department.
- Adoption of the c-spine rules by emergency nurses improves ED patient flow and thus reduces time to c-spine clearance thereby decreasing patient's pain, reduction in unnecessary radiation and alleviates resources in the ED.

Introduction

The cervical spine (c-spine) collar is a temporarily applied immobilisation device. It was introduced as a precautionary measure following the first Advanced Trauma Life Support (ATLS) course in 1978 as a routine recommendation.[1] This recommendation was developed because it was believed immobilising the spinal column following injury would be an effective way to prevent injury to the spinal cord attributed to movement of a destabilised neck.[2] Blunt trauma patients are routinely placed in c-spine collars often based on mechanism of injury alone.[3] A c-spine collar is applied according to the common mantra, 'assume a patient has a c-spine injury until proven otherwise'.[4] This practice remains in place across the globe[5] despite the evidence indicating that c-spine collars do not prevent neck movement and are associated with a high risk of complications, delay to diagnosis and definitive care.[6–11] It is unknown how many patients present to Australian emergency departments (ED) annually with potential c-spine injuries, however each year there is an estimated 2 million patients with blunt trauma and potential c-spine injury treated in the United States (USA).[12,13]

The Canadian C-Spine rule (CCR) and the National Emergency X-Radiography Utilisation Study (NEXUS) criteria are well validated, widely used clinical decision rules to guide the clearance of the c-spine and radiography in patients with low risk trauma.[12,14] Low risk patients are considered those who present with c-spine collars post blunt trauma who are alert, co-operative, non-intoxicated, not complaining of midline neck pain and have no tenderness over the bony cervical spine.[15]

There are several studies that conclude spine immobilisation may cause more harm than good in a select sub-group of trauma patients.[6,7,10] Milby, Halpern, Guo, Stein's[9] 2008 meta-analysis of 65 studies showed the prevalence of a c-spine injury following trauma in alert patients was 3.7% ($n = 281,864$). Of this 3.7%, 2.8% suffered c-spinal injury, whereas the 'unevaluable' patients were at increased risk of c-spine injury with a prevalence of 7.7%. Hood and Considine[8] 2015 systematic review examining evidence related to spinal immobilisation in pre-hospital and emergency care settings is almost all extrapolated data, mostly from healthy volunteers. Based on current evidence it appears immobilisation of the c-spine does not prevent movement, has a high risk of complications and delay to diagnosis and definitive care.[6–10] Although the original intent and validation of NEXUS and CCR was to determine patients who required imaging, these rules have translated into clinical decision making around the application of cervical collars, despite the lack of evidence that these collars offer any benefit to patients.

Uptake of these clinical decision rules is varied and spinal immobilisation can stay in place unnecessarily for protracted periods of time in the alert, orientated low risk adult trauma patient causing prolonged discomfort and risk of complications such as; aspiration, respiratory compromise, iatrogenic pain, pressure ulceration and unjustified radiography.[16] Further, there are routinely and without justification patients receiving unnecessary radiographic imaging and associated radiation exposure.[15] The CCR has been demonstrated to be safe for use in the pre hospital environment by paramedics, and by medical staff in the hospital environment, however delays to clearance remain.[17]