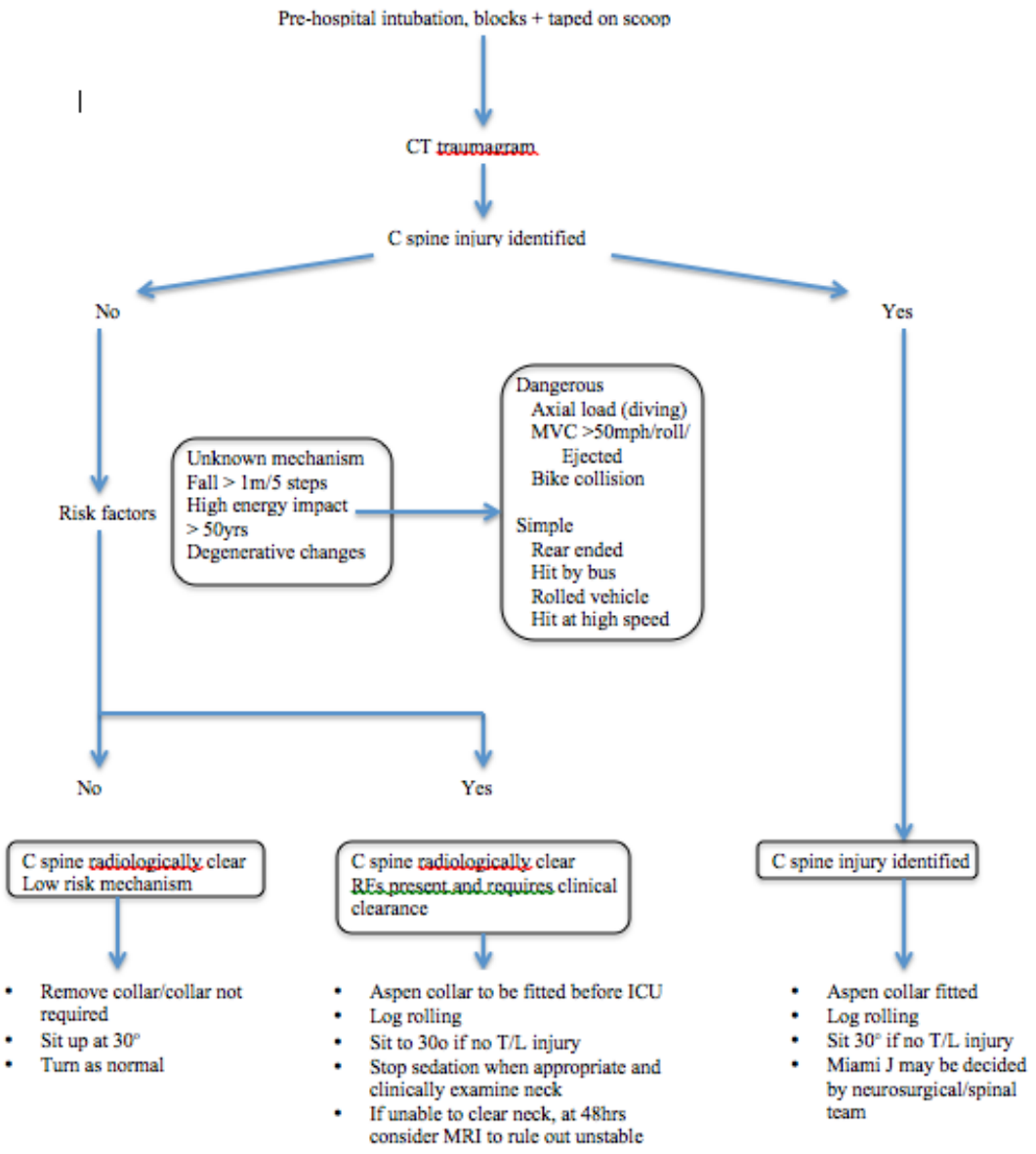
C SPINE CLEARANCE IN THE INTUBATED TRAUMA PATIENT



1. Pre-hospital management of the potential unstable C-spine injury has changed and the use of hard collar extraction devices has now moved to use of blocks and tape with scoop for immobilisation.

2. Trauma patients received by the Emergency Department should have their CT traumagram within 30-60 mins of reception in ED, including those that have been intubated pre-hospital.

3. With the increase in sensitivity of CT (RSCH CT scanning obtains 1mm slice images), studies have shown that radiological clearance of CT is sufficient to rule out C Spine injuries (unless in high risk group – see above). This should not over-rule clinical concern for potential injuries in high risk cases.

4. In ventilated patients with high risk mechanisms, degenerative changes pre-injury or subtle signs of potential injury, Aspen C spine collars should (unless otherwise directed by spinal team) be applied in ED before transfer to ICU. Following this, they should be discussed with the spinal team and CT imaging be reviewed with a consultant radiologist.

5. If low risk and CT cspine shows no evidence of bony injury, no c spine collar is required or it may be removed. This must be decided by/with the ICU consultant and spinal consultant.

6. In cases with ongoing clinical concern or signs of potential injury, the collar must remain and the patient should have sedation reduced to allow extubation and clinical examination.

7. If this is not possible, then at 48 hours further imaging (ie MRI imaging) should be performed to allow for further clearance.

8. In case of identified C spine injury, the spinal team must document the precautions required for the patient. Please refer to the spinal injury pathway for further guidance of management

9. If following removal of C-spine collar and extubation, clinical concern eg. pain/injury, re-apply collar and repeat imaging with spinal review.

Evidence supporting protocol

Rational	Evidence	Source
Very small risk of unidentified spinal injury	Meta-analysis of 1,017 pts with no pts with missed unstable c spine injuries.	Patel M et al. J Trauma Acute Care Surg. 2015; 78 (2): 430-441
	Case series of over 14,000 patients without a single missed injury on CT showing sensitivity and specificity of greater than 99.9% in detecting an unstable cervical spine.	Panczykowski D et al. Journal of Neurosurgery 2011; 115: 541-549.
	Registry-based review of 319 trauma patients found that CT had a 100% sensitivity for detecting spinal fractures.	Antevil JL *et al.* J Trauma 2006;61:382-87
	A study was carried out in 1400 patients suffering blunt trauma to the head and neck. 366 patients were obtunded and unable to be cleared clinically despite a normal CT c spine. All scanned with MRI. 4 ligamentous injuries were found, none of which were unstable.	Hogan G *et al*. Radiology 2005; 237: 106-113.
	Retrospective review of 14577 blunt trauma patients found that ligamentous injuries without C-spine fracture are very rare (<0.6%)	Chiu WC *et al.* J Trauma 2001; 50:457–63.

Evidence for risks with C-spine collar use

Risk		Reference
Pressure sores	Risk for pressure sore from collar increases by 66% per day increase in use.	Ackland HM *et al* Spine 2007; 32: 423-428.
VAP risk	Increased risk from supine position	Hunt JD *et al* BMJ 2012; 344 e3325.
Difficult airway	Collar causing reduced mouth opening	Criswell JC *et al.* Anaesthesia 1994; 49: 900–903.
ICP/venous drainage	Mean increase ICP of 4.6mmHg (resolving with removal)	Hunt, K *et al.* Anaesthesia 2001; 56: 511–513.
Staffing requirements	Effect of staff required for regular log rolling and turning	Harrison P *et al* Contin Educ Anaesth Crit Care Pain 2008; 8 (4): 117-120.