TRAUMA/CRITICAL CARE SURGERY

DEPARTMENTAL GUIDELINES AND PROCEDURES

TITLE: C-SPINE CLEARANCE GUIDELINE

PURPOSE: To provide a guideline for the initial evaluation and management for cervical spine (c-spine) clearance at Ben Taub Hospital.

GUIDELINES/PROCEDURES STATEMENT:

The National Emergency X-Ray Utilization Study (NEXUS) was an American study published in 2000 providing a clinical decision guide to avoid excessive radiographic studies when trying to clear the alert and stable blunt trauma patient's c-spine.[1] It involved more than 34,000 subjects and provided a means of ruling out cervical spine injury with 99% sensitivity.

Subsequently, Stiell *et al.* took a different approach (the Canadian C-Spine Rule).[2] They proposed a means of clearing the trauma patient's c-spine without actually examining the patient, based on risk factors associated with mechanism of injury, age, and paresthesias in the extremities, but also included the patient's ability to rotate the neck 45 degrees in both directions.

The Eastern Association for the Surgery of Trauma (EAST) published their guidelines for c-spine clearance in the trauma population in 1998. They have been updated twice, most recently in 2009.[3] All three articles were considered (in addition to more recent literature on the lack of usefulness of MRI in c-spine clearance following trauma) in the production of this guideline[4-6].

I. GUIDELINES/ RATIONALE:

1. If the patient meets all 5 of the following criteria:
   - No midline cervical spine tenderness to palpation
   - No focal neurologic deficits
   - Normal alertness
   - No alcohol or drug substances on board
   - No distracting injury

   NO IMAGING IS REQUIRED. CLEAR THE C-SPINE CLINICALLY.

   Ask the patient to slowly rotate their neck from side to side as well as flexing their neck ("lift your head off the bed, chin to chest") and extending their neck ("eyes to the ceiling"). If the patient experiences:

   - No neck pain or extremity paresthesias with these movements, remove the c-collar.
   - Any neck pain or extremity paresthesias with these movements, the patient is instructed to stop moving their neck, ***the hard field c- collar is replaced, and a multi-detector computed tomography (MDCT) scan of the c-spine is obtained as the primary screening modality.***

2. If the patient does not meet all 5 of the criteria listed under 1., ***the hard field c-collar is to be left in place and a MDCT of the c-spine is obtained as the primary screening modality.***

MDCT of the C-Spine:

1. The MDCT must be performed with multi planar reformations as per the radiology c-spine protocol.
2. If the MDCT of the c-spine demonstrates an injury, consult Spine Surgery (Neurosurgery or Orthopedic Surgery depending on the day of the week).
3. If the MDCT is negative (no bony injuries, no evidence of peri-spinal soft tissue swelling, no other concerns for acute c-spine injury, no major degenerative changes… [deemed concerning by the Surgical Attending]):
    a. <u>In obtunded patients</u>, the c-collar should be removed if there is no evidence of gross motor deficits.
    b. <u>In awake and alert patients:</u>
        i. For any neurologic deficits or paresthesias proceed with an MRI:
            1. If the MRI is normal on final Radiology Attending read, the c-collar should be removed.
            2. If an injury is suspected/found, maintain the c-collar and consult Spine Surgery (Neurosurgery or Orthopedic Surgery depending on the day of the week) if not already involved.
        ii. With a normal neurologic examination and pain or tenderness only, the c-collar should be removed. A soft collar may be provided for comfort.

Miscellaneous Points:

1. Hard field c-collars should be removed as soon as feasible after trauma. If the patient is going to be admitted with a c-collar in place, it should be exchanged for an Aspen C-Collar, after obtaining the MDCT of the c-spine [and results]).
2. The c-collar may be removed at the discretion of the Trauma Surgery, Neurosurgery, or Orthopedic Surgery Attending in instances of STAT surgical interventions where the c-collar will affect the surgical procedure.
3. In the evaluation of the c-spine, plain radiographs contribute no additional information and should not be obtained.
4. The phenomenon of multilevel, noncontiguous spinal fractures is well documented. That being said, a fracture identified in any region of the spine (in blunt trauma), in particular the c-spine, is an indication for radiographic screening of the entire spine.

REFERENCES/BIBLIOGRAPHY:

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2. Stiell IG, Wells GA, Vandemheen KL, et al. The Canadian c-spine rule for radiography in alert and stable trauma patients. *JAMA* 2001;286:1841-8.
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4. Chew BG, Swartz C, Quigley MR, et al. Cervical spine clearance in the traumatically injured patient: is mutlidetector CT scanning sufficient alone? *J Neurosurg Spine*. 2013;19:576-81.
5. Kanji HD, Neitzel A, Sekhon M, et al. Sixty-four slice computed tomographic scanner to clear traumatic cervical spine injury: a systematic review of the literature. J Crit Care. 2014;29:314e9-13.
6. Raza M, Elkhodair S. Zaheer A, Yousaf S. Safe cervical spine clearance in adult obtunded blunt trauma patients on the basis of a normal multidetector CT scan – a meta-analysis and cohort study. Injury. 2013;44:1589-95.

DEPARTMENT OF PRIMARY RESPONSIBILITY:

Trauma Services

REVISION HISTORY:

Effective Date	Version # (If Applicable)	Review or Revision Date (Indicate Reviewed or Revised)	Reviewed or Approved by: (Directors, Committees, Managers, and Stakeholders etc.)
	1	1/4/17	Trauma Protocol Committee
		1/24/17	Trauma PI/Program Committee