The University of Arkansas for Medical Sciences
Trauma Clinical Practice Management Guideline

SUBJECT: Cervical Spine Evaluation & Clearance Guidelines

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PURPOSE: To provide guidelines for the diagnostic evaluation and subsequent clearance of cervical spine injuries in the traumatically injured patient and to standardize these procedures across all services and phases of care.

DEVIATIONS: Deviations from these standards require attending involvement and discussion.

ABREVIATION: c-spine: cervical spine; c-collar: cervical collar

INCLUSIONS: Trauma patients presenting to UAMS with spinal injuries *without known or suspected cord involvement.*

EXCLUSIONS: Suspicion or evidence of spinal cord injury (see separate SCI guideline).

CONSULTATION: The spine team should be notified immediately upon *confirmation* of cervical spine injury. Please refer to the SCI guideline for patients with high suspicion of spinal cord injury.

GENERAL CONSIDERATIONS:

1. Radiologic clearance of the cervical spine should occur after the patient has undergone hemodynamic, respiratory, and surgical stabilization. During such stabilization, the cervical spine should be kept immobilized.
2. Penetrating trauma does not require a c-collar unless accompanied by significant blunt trauma or suspicion of penetrating injury to the spine.
3. The field C-spine collar is to be replaced by an Aspen collar as soon as patient safety allows.
4. There should be no more than one attempt at c-collar clearance per day.

RISK STRATIFICATION:

1. LOW-RISK: A patient may be considered low risk if ALL the following are TRUE:
    a. No posterior midline cervical pain/tenderness
    b. Normal mental status (no confounding TBI, intoxication, shock)
    c. No historical or physical exam evidence of a focal neurological deficit
    d. No significant distracting injury (Note that if the patient can concentrate and comply with an exam, the injury is not “distracting.”)
    e. A low-energy mechanism, such as a slow-speed MVC, bicycle collision, or fall from standing
2. HIGH-RISK: A patient may be considered high risk if ANY of the following are TRUE
    a. Presence of posterior midline cervical tenderness
    b. Abnormal mental status (regardless of cause).
    c. Physical exam evidence of a new focal neurological deficit

d. Significant distracting injury (patient unable to cooperate/comply for examination)
e. Strongly consider high-energy mechanisms to be high risk, which are defined as: fall from ≥3 ft (0.9 m) / 5 stairs, axial load injury, high speed MVC/rollover/ejection, bicycle collision, or motorized recreational vehicle
f. Strongly Consider Age ≥ 65 years

IMAGING:

1. No role for plain films in the initial assessment of cervical spine injuries
2. LOW-Risk patients may be cleared clinically (see below)
3. HIGH-Risk patients should receive a dedicated, non-contrast CT cervical spine scan from the occiput to T1, with sagittal and coronal reconstructions.
   a. If the patient is to be admitted to the hospital, c-spine clearance can await final attending read.
   b. If the patient is to be otherwise discharged, a FINAL ATTENDING READ should be requested by contacting the radiology resident on call.
4. MRI has no *routine* role in the management of c-spine clearance. Obtunded patients with a normal CT cervical spine (per final, attending read) AND without history or physical examination evidence of spinal cord injury may have their collar removed.
5. MRI may be required if the CT spine is negative, but the history and physical suggest a focal neurological deficit (see separate spinal cord injury guideline).

DISPOSITION:

1. Patients without cleared c-spines shall be dispositioned based on other injuries.
2. Those patients who cannot be clinically cleared for pain or a limited range of motion should receive a cervical spine CT scan as described above.
3. In the absence of other indications for inpatient admission, a patient may be clinically cleared if they have a negative cervical spine CT scan as read by an attending radiologist, AND their neurologic exam is at baseline.
4. If there is a new neurologic deficit that localizes to the cervical spine, an MRI of the c-spine should be considered; please refer to the spinal cord injury policy for further recommendations.
5. In the rare event that there is clinical concern for ongoing spinal injury in a patient with a negative cervical spine CT and normal neurologic exam, a spine consult should be obtained for all admitted patients. For emergency department patients, the attending physician may opt to obtain an MRI of the cervical spine OR consult a spine specialist for assistance. If the MRI is negative according to the final attending read, the cervical collar can be cleared without a spine consult.
6. If the spine team is consulted and recommends discharge in a rigid cervical collar, the patient should be placed in an Aspen collar and referred to the spine clinic for further evaluation.

CERVICAL SPINE CLEARANCE PROCEDURE:

1. General Considerations:
   a. The cervical spine clearance procedure should only be performed on alert patients who are either low-risk and eligible for clearance without imaging or have had a negative cervical spine CT scan. Patients who are unconscious or intubated due to intracranial pathology may have their cervical collar removed as stated above.
   b. If the Spine team is following for a concomitant thoracolumbar spinal cord injury, that team should perform the c-spine clearance exams.

c. If an emergency department patient is being discharged after a negative cervical spine CT scan, the emergency department team is responsible for ensuring cervical spine clearance.
d. Every attempt to clear the cervical spine collar should be documented in Epic (see "dot phrase" below).
e. No more than one attempt should be made in a day.
f. Clearance testing should be conducted as soon as it is safe and feasible.

2. Qualified Examiners: Physicians, APNs, or PAs who have:
   a. Observed the clearance procedure at least once
   b. Reviewed these guidelines
   c. Been proctored by a qualified examiner for two examinations.
   d. Have access to Epic for order writing and documentation purposes.
3. Clearance Examination
   a. Assess the patient's mental status and ability to comply with the examination.
   b. Instruct the patient to notify you of any posterior or midline pain.
   c. Instruct the patient not to move the head until told to do so.
   d. With a c-spine collar in place, palpate the posterior cervical midline for gross deformity.
   e. Instruct the patient to go through the ranges of motion (flexion, extension, and lateral rotation) and report any posterior midline pain or discomfort, as well as any neurological symptoms.
   f. The cervical collar can be removed as long as none of the following are present:
      - cervical spine deformity
      - radicular symptoms
      - new neurologic findings
      - specific concern for ongoing cervical injury.
   g. Place c-collar clearance note in Epic (see suggested dot phrase in Appendix 1)
   h. Place "d/c c-collar order" in Epic
   i. No further imaging is necessary unless symptoms occur.

REFERENCES:

1. https://www.facs.org/quality-programs/trauma/quality/best-practices-guidelines/
   a. ACS TQIP Best Practice Guidelines: Imaging
   b. ACS TQIP Best Practice Guidelines: Spine Injury
2. Patel MB, Humble SS, Cullinane DC, et al. Cervical spine collar clearance in the obtunded adult blunt trauma patient: a systematic review and practice management guideline from the Eastern Association for the Surgery of Trauma. The journal of trauma and acute care surgery. 2015 Feb;78(2):430.
3. Hoffman JR, Wolfson AB, Todd K, Mower WR, NEXUS Group. Selective cervical spine radiography in blunt trauma: methodology of the National Emergency X-Radiography Utilization Study (NEXUS). Annals of Emergency Medicine. 1998 Oct 1;32(4):461-9.
4. Stiell IG, Wells GA, Vandemheen KL, Clement CM, Lesiuk H, De Maio VJ, Laupacis A, Schull M, McKnight RD, Verbeek R, Brison R. The Canadian C-spine rule for radiography in alert and stable trauma patients. Jama. 2001 Oct 17;286(15):1841-8.
5. Inaba K, WTA C-Spine Study Group. Cervical spinal clearance: A prospective Western Trauma Association Multi-institutional Trial. J Trauma Acute Care Surg. 2016 Dec;81(6):1122-1130. doi: 10.1097/TA.0000000000001194. PMID: 27438681; PMCID: PMC5121083.

APPENDIX I:

Proposed c-spine clearance Epic dot phrase (to only be used when c-spine cleared):

C-spine clearance note:

C-collar in place.

High-quality dedicated CT cervical spine shows no acute cervical fractures, evidence of injuries to the spinal cord, or injuries to spinal ligaments per the final attending radiologist read.

The patient is awake and alert, able to understand and follow commands.

No step-offs or other gross deformities of the cervical spine are present. There is no new neurologic deficit. Full, active range of motion of the cervical spine (flexion, extension, lateral rotation) was completed without radicular pain or paresthesias. Passive range of motion was not performed.